dotFIT®

Your Fitness. Connected.

Supplement Reference Guide

2nd Edition 2012

Second Edition 2012

Statements found in this guide have not been evaluated by the FDA. dotFIT products are not intended to treat, cure or prevent any disease.

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Introduction

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  - NASM activates over 25,000 credentials annually with over 100,000 professionals worldwide
  - Works with over 6,000 health clubs and all professional sports organizations
- Evidence-based tools and applications
  - R&D and support for nutrition/weight control and exercise programming for all ages and goals
  - Web-based, client- and trainer-centric programming: exercise, menu plans with supplement screening, continuous feedback to client and/or trainer based on measurement inputs and goal
- Worldwide professional delivery network
  - Live fitness professionals as well as phone and e-coaching platforms
- Programs can connect to body sensing/tracking devices
  - Calorie expenditure, steps, physical activity, etc.
- Unlimited education: For consumers and professionals via website, live webinars, certifications, and direct access to R&D team via our toll-free phone number (877.436.8348)
- Complete, holistically integrated line of pharmaceutically manufactured dietary supplements and fitness foods including home delivery platform

dotFIT Worldwide Faculty and Advisory Board

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dotFIT Worldwide's Position on Use, Recommendations & Manufacture of Dietary Supplements

The function of dietary supplement preparations is to provide a safe vehicle for delivering precise amounts of desired isolated nutrients and compounds in a low to no calorie form with the purpose of enhancing health, sport and fitness goals, i.e. dietary support.

Individual outcomes from the use of dietary supplements, as with drugs, are predicated on the physiological and psychological state of the recipient as well as dosages, regiment compliance, manufacturing processes including the use of proper delivery systems, and ingredient forms or origins.

dotFIT's position on overall dietary supplement use and recommendations

Dietary supplement products must be 100% defensible through scientific research, not used to treat medical conditions and only recommended in support of the following goals:

- Preserving health
  - Objective: potentially stave off chronic or age-related disease by improving the daily nutrient intake achieved through diet alone
- Safely enhance sport and fitness outcomes
  - Objective: hasten and support fitness/weight control goals
  - Objective: improve training-induced performance results

Position on use of supplements for health

Multivitamin and mineral formula (MVM): all persons of all ages should use a daily MVM to complement one's best efforts to define and consume a proper diet.[1,2]

At a minimum, MVM supplementation is insurance against common and unavoidable shortcomings driven by typical daily diets and local food supply or availability.[3,4] At best, the daily increased level of all known vital nutrients supplied by the MVM may indeed allow optimal cellular performance. Levels of nutrition delivered by diet combined with a MVM (significantly higher but well within a safe range) has more potential than diet alone (especially within a range of acceptable calories) to supply all cellular entities/enzymes with enough materials to operate at full capacity thus avoiding a potential triage effect that may be at the root of many chronic and age-related diseases. [4,5,6,7,8] (see Appendix 1: dotFIT Worldwide's Position on Vitamin & Mineral Supplementation).

Calcium & Vitamin D: supplement if daily needs of calcium (1000-1200mgs/day) and vitamin D (400-1000 IUs/day) are not met by food, sunlight and multivitamin mineral formula.[5,9,10] There is almost no reason to supplement calcium alone.

Position on use of supplements in support of weight control

Dieting to lose weight is difficult for everyone and generally ends with most of the weight regained within the first year.[11,12,13]

The goal of incorporating a dietary supplement or drug into a weight loss program is to assist the participant in complying with the daily routine that leads to weight reduction. The supplement ingredients must have safely demonstrated the potential to act in one or more of the following ways:

- Help create and maintain a calorie deficit by increasing daily calorie expenditure when compared to a non-supplemented state
- Raise energy levels that may make one more active throughout the day
- Reduce the drive to consume food
- Decrease calorie absorption

The dieter would cease supplementation once the weight goal is reached or when they have their daily routines under control to continue making progress without supplements.

Position on use of supplements for enhancing performance

Maximizing potential during high-level competition involves athletes exploiting all available resources – some good and some bad. In the 2008 Olympics, 90% of the 11,000 athletes reported regularly using dietary supplements. There was not a single supplement contamination case, giving a "thumbs up" to the dietary supplement industry for making safe, unadulterated substances.[14]

There is unequivocal evidence that a limited number of natural substances prepared and ingested properly can safely improve training-induced size or performance for many athletes.[15,16,17,18,19,20,21] Historically, however, athletes have had a tendency to not follow directions. Many subscribe to the old adage, "if a little works, more is better." The practice of overconsumption of anything—such as foods, dietary compounds, and drugs—can lead to problems. On the other hand, proper supplementation for performance has often been shown to generate truly remarkable benefits, and this in itself can save many athletes from turning to illegal anabolic steroid use, which has well-known harmful side effects. The rationale behind using nutritional strategies to avoid training plateaus centers around findings that the extent of muscle damage induced by exercise appears to remain constant throughout a prolonged training regimen. Meaning, repeated exercise sessions continue to "open the door" for the building process even if no muscle or strength gains are being produced.[22]

Therefore, when the benefits of training and diet on muscle mass and performance have stabilized, specific nutrient supplement regimens may play a role in plateau avoidance and progressive development for many athletes.

Position on final individual recommendations

All dotFIT programs prepared by dotFIT Worldwide are designed to screen individuals based on physical characteristics and goals in order to safely and properly integrate dietary supplements into their fitness programs to accomplish the above stated outcomes.

Position on manufacturing and facts regarding dotFIT products

Before nutritional compounds become products or are recommended for consumer use, all ingredients must survive rigorous legal and scientific review and testing. The following conditions are met:

- Identify best, current clinical research supporting use of active ingredients (evidence-based)
- Identify data supporting safety and efficacy including long-term empirical data (see Table 1 below and Evaluation Guidelines)
- Identify proper ingredient dosage and forms matched to positive outcomes from clinical data
- As science progresses, all products must be updated immediately

Products are designed in appropriate delivery forms established by each product's ingredients, desired target tissues, and the amounts required in specific time periods to deliver on the product claims. In other words, validate that the right ingredients and amounts get to the right places at the right times.

- Customized finished products are tested in a simulated human digestive system to validate whether release patterns match their respective designed criteria in order to assure the desired results
- Dietary supplement products and powders are manufactured in a FDA-registered pharmaceutical facility, in compliance with Good Manufacturing Practices (GMP)
- Ingredient testing for purity, potency and delivery from raw materials to finished product
- Final product rigorous testing, both in-house and through third-party, FDA-approved and NSF-certified laboratories, assures users that all nutritional claims meet or surpass FDA guidelines, USDA guidelines, and industry norms
- All formulas must be able to work in synergy with other dotFIT products in order to avoid nutrient overages, which are common with typical, indiscriminate supplement use

dotFIT programs consider diet, medications, and other dotFIT products before a personalized dietary supplement recommendation is generated. This assures the user remains in a safe and optimal nutrient range throughout the day.

dotFIT foods cannot be "spiked" with unnecessary nutrients. Most other products in this space (e.g. bars, shakes, ready-to-drinks, etc.) are heavily spiked with many nutrients that can lead to undesirable levels within the body when combining multiple manufacturers, products and normal food intake. When consuming only dotFIT products, as directed with one's normal daily food intake, the recipient can be assured of keeping the body at a safe and optimal nutrient level.

dotFIT must provide complete customer product/program education and support, including full disclosure regarding product ingredients, safety and manufacturing.

Product Testing Documentation

- Tests that include disintegration, dissolution, stability, purity (no contaminants) and potency, which includes the finished product's certificate of analysis
- In-house and 3rd party product validation and testing methods based on all available certified protocols including applicable USPs (United States Pharmacopeia, an official compendia of standards) and other international compendia – also see dotFIT Product Manufacturing and Testing document in Appendix
- Appropriate peer-review research that supports the dosage and purpose of the compound
- Proof of equivalence or evidence that a given dose of a product must contain a certain amount of key ingredients in order to produce a known effect
- Proof that products will be absorbed and utilized by the body
- Assurance that the substance is nontoxic, along with list of any known potential side effects and drug interactions
- Qualified personnel and support documents available to all consumers via www.dotFIT.com or 877.436.8348

Product Evaluation Guidelines and Scoring

Only products/ingredients that score a four or five out of five possible points are potential dotFIT Worldwide-authorized products and may become integrated into holistic fitness planning (e.g. combined with diet and movement planning). See Table 1.

Review of Products

A. Criteria for evaluation: to establish product integrity
    i. History of safe use
    ii. Cultural or traditional medicine
    iii. Anecdotal or empirical reports
B. Product formulation
C. Individual ingredients

Research documenting claims, performed on humans

D. Published in peer reviewed literature – citation(s)
    i. Product formulation
    ii. Individual ingredients
E. Books/brochures and company marketing brochures or sales sheets
    i. Product formulation
    ii. Individual ingredients
F. Privately sponsored, unpublished reports or studies
    i. Product formulation
    ii. Individual ingredients
G. Research supporting either a biochemical or physiological rationale

Research documenting claims, performed on animals

H. All same as above

Safety Studies

I. Animal toxicology studies

J. In vitro toxicology studies
K. Human clinical evaluations
   i. Dosage and route of administration
   ii. Toxicity
L. Human anecdotal/empirical reports
   i. Dosage and route of administration
   ii. Toxicity

Adverse Event Reports
M. Center for Disease Control (CDC)
N. Food and Drug Administration (FDA)
O. World Health Organization (WHO)
P. State Health Departments
Q. Trial Lawyers Association: personal injury litigation groups

Food and Drug Administration
The regulatory agency for approved claims with medical – scientific evidence for documentation of educational marketing claims in advertising and 'third party' literature under DSHEA*.
R. Structure (anatomy) claims
S. Function (physiology) claims
T. 'Life Event' claims
U. Fitness claims
V. Anabolic/weight gain claims
W. Androgenic/strength and endurance claims
X. Fat loss (lipolysis) claims
Y. Metabolic rate (BMR) and lean body mass claims
Z. Cardiovascular tone/'aerobic' fitness claims
AA. Recovery time/'muscle burn' claims

* DSHEA is the Dietary Supplement Health Education Act of 1994. The DSHEA established a formal definition of "dietary supplement" using several criteria. A dietary supplement
- is a product (other than tobacco) that is intended to supplement the diet that bears or contains one or more of the following dietary ingredients: a vitamin, a mineral, an herb or other botanical, an amino acid, a dietary substance for use by man to supplement the diet by increasing the total daily intake, or a concentrate, metabolite, constituent, extract, or combinations of these ingredients
- is intended for ingestion in pill, capsule, tablet, or liquid form
- is not represented for use as a conventional food or as the sole item of a meal or diet
- is labeled as a "dietary supplement"
- includes products such as an approved new drug, certified antibiotic, or licensed biologic that was marketed as a dietary supplement or food before approval, certification, or license (unless the Secretary of Health and Human Services waives this provision)

Table 1—Product Evaluation Score: Rating of Evidence
Only products that score a four or five rating are potential dotFIT authorized products.

SCORE	RATING	DOCUMENTATION/ EVIDENCE CRITERIA
5	Excellent (>90% Probability)	Product formulation claims documented by human studies
4	Very Good (>70%<90% Probability) (High Probability)	At least two (2) of the product's formulated ingredients claims documented by human studies
3	Good (<70%>30% Probability) (Medium Probability)	One of the product's formulated ingredients claims documented by human studies
2	Fair (>10%<30% Probability) (Low Probability)	No human studies. However, at least two (2) of the product's formulated ingredients have a biochemical- physiologic rationale
1	Poor <10% Probability) (Questionable Probability)	No human studies. However, at least one (1) of the product's formulated ingredients have a biochemical– physiologic rationale
0	Fails (Zero Probability – "Hype")	No documented human studies, and no biochemical – physiologic rationale for any ingredients

The Products

Included in this guide are the following for each dotFIT product:

- Goal
- Rationale
- Typical Use
- Dosage
- Definitions
- Precautions
- Contraindications
- Adverse Reactions
- Upper Limits/Toxicity

Definitions

Goal

Describes the purpose of the formulation, including each product's intended outcome.

Rationale

Lists the ingredient's basic mechanisms of action and their respective function in participating in the product's intended outcome or goal.

Typical Use

Describes the known group of users that may experience the product's potential listed benefits.

Dosage

Lists the dosages used in studies and historically with the greatest potential for safety and efficacy.

Precautions

The compounds in this Supplement Reference Guide (SRG) are considered safe for the general population at the proper dosage. Under this heading and the subheadings below, a summary of safety considerations will be called out for potential vulnerable subpopulations.

Contraindications

Describes conditions in which the compound might be avoided or signal caution, including people with unique genetic predispositions, certain pre-existing disease states or persons taking specific prescription medications.

Adverse Reactions

Lists possible side effects and/or explains commonly reported reactions that may not be clinically supported or causally related to the compound. Case reports may be used to explain theoretical risk when clinical trials or specific studies are not available. Case reports are not considered scientifically valid for proving efficacy or documenting risks, but may be used to highlight an unlikely but potential safety issue.

Upper Limit/Toxicity

Gives the highest known dose that still maintains a large margin of safety and any known toxicity data. When available the Recommended Daily Allowance (RDA), **No Observed Adverse Effect Level (NOAEL)**, **Lowest Observed Adverse Effect Level (LOAEL)** and the lethal dose 50 (LD50) values will be given. The LD is the dose at which 50% of the test animals (rats or mice) died and is usually only used as a reference for the relative toxicity of a substance.

The **Tolerable Upper Intake Level or Upper Limit (UL)** is the maximum level of total chronic (long-term) daily intake judged unlikely to pose a risk of adverse health effects to most of the healthy population, including sensitive individuals, throughout their life stages. The UL is intended to provide a safety standard for dietary supplements such that no significant or unreasonable risk of illness or injury would arise at or below this intake level.

References

1 Fairfield KM, Fletcher RH. Vitamins for chronic disease prevention in adults: scientific review .JAMA. 2002 Jun 19;287(23):3116-26. Review.
2 [No authors listed] Multivitamins: should you buy this insurance? Studies have raised doubts about vitamins, but the multivitamin pill is still a good idea. Harv Health Lett. 2006 Sep;31(11):3-5.
3 Krebs-Smith SM, Guenther PM, Subar AF, Kirkpatrick SI, Dodd KW. Americans do not meet federal dietary recommendations. J Nutr. 2010 Oct;140(10):1832-8. Epub 2010 Aug 11.
4 Calton JB. Prevalence of micronutrient deficiency in popular diet plans. J Int Soc Sports Nutr. 2010 Jun 10;7:24.
5 Autier P, Gandini S. Vitamin D supplementation and total mortality: a meta-analysis of randomized controlled trials. Arch Intern Med. 2007 Sep 10;167(16):1730-7. Review.
6 Garland CF, Garland FC, Gorham ED, Lipkin M, Newmark H, Mohr SB, Holick MF. The role of vitamin D in cancer prevention. Am J Public Health. 2006 Feb;96(2):252-61. Epub 2005 Dec 27. Review.
7 Xu Q, Parks CG, DeRoo LA, Cawthon RM, Sandler DP, Chen H. Multivitamin use and telomere length in women. Am J Clin Nutr. 2009 Jun;89(6):1857-63. Epub 2009 Mar 11.
8 Ames BN. Low micronutrient intake may accelerate the degenerative diseases of aging through allocation of scarce micronutrients by triage. Proc Natl Acad Sci U S A. 2006 Nov 21;103(47):17589-94. Epub 2006 Nov 13. Review.

9 Institute of Medicine. Dietary Reference Intakes: Vitamins. Washington DC: National Academy Press; 2008. 6p.
10 Hollis BW. Circulating 25-hydroxyvitamin D levels indicative of vitamin D sufficiency: implications for establishing a new effective dietary intake recommendation for vitamin D. J Nutr. 2005 Feb;135(2):317-22. Review.
11 Lien LF, Haqq AM, Arlotto M, Slentz CA, Muehlbauer MJ, McMahon RL, Rochon J, Gallup D, Bain JR, Ilkayeva O, Wenner BR, Stevens RD, Millington DS, Muoio DM, Butler MD, Newgard CB, Svetkey LP. The STEDMAN project: biophysical, biochemical and metabolic effects of a behavioral weight loss intervention during weight loss, maintenance, and regain. OMICS. 2009 Feb;13(1):21-35.
12 McGuire MT, Wing RR, Klem ML, Lang W, Hill JO. What predicts weight regain in a group of successful weight losers? J Consult Clin Psychol 1999;67:177–85.
13 Phelan S, Hill JO, Lang W, Dibello JR, Wing RR. Recovery from relapse among successful weight maintainers. Am J Clin Nutr. 2003 Dec;78(6):1079-84.
14 Starling, Shane. "Dietary supplements win Olympic gold." 2008. NutraingredientsUSA. 15 Sep. 2008 < http://www.nutraingredients-usa.com/Industry/Dietary-supplements-win-Olympic-gold >.
15 Doherty M, Smith PM. Effects of caffeine ingestion on rating of perceived exertion during and after exercise: a meta-analysis. Scand J Med Sci Sports. 2005 Apr;15(2):69-78. Review.
16 Buford TW, Kreider RB, Stout JR, Greenwood M, Campbell B, Spano M, Ziegenfuss T, Lopez H, Landis J, Antonio J. International Society of Sports Nutrition position stand: creatine supplementation and exercise. J Int Soc Sports Nutr. 2007 Aug 30;4:6.
17 Chrusch MJ, Chilibeck PD, Chad KE, Davison KS, Burke DG. Creatine supplementation combined with resistance training in older men. Med Sci Sports Exerc. 2001 Dec;33(12):2111-7.
18 Astorino TA, Roberson DW. Efficacy of acute caffeine ingestion for short-term high-intensity exercise performance: a systematic review. J Strength Cond Res. 2010 Jan;24(1):257-65. Review.
19 Goldstein ER, Ziegenfuss T, Kalman D, Kreider R, Campbell B, Wilborn C, Taylor L, Willoughby D, Stout J, Graves BS, Wildman R, Ivy JL, Spano M, Smith AE, Antonio J. International society of sports nutrition position stand: caffeine and performance. J Int Soc Sports Nutr. 2010 Jan 27;7(1):5.
20 Ganio MS, Klau JF, Casa DJ, Armstrong LE, Maresh CM. Effect of caffeine on sport-specific endurance performance: a systematic review. J Strength Cond Res. 2009 Jan;23(1):315-24. Review.
21 Kerksick C, Harvey T, Stout J, Campbell B, Wilborn C, Kreider R, Kalman D, Ziegenfuss T, Lopez H, Landis J, Ivy JL, Antonio J. International Society of Sports Nutrition position stand: nutrient timing. J Int Soc Sports Nutr. 2008 Oct 3;5:17. Erratum in: J Int Soc Sports Nutr. 2008;5:18.
22 Tipton KD, Cocke TL, Wolf SE, Wolfe RR. Response of muscle protein metabolism to resistance training and acute resistance exercise during hyperaminoacidemia. Am J Physiol, 2006; in press.

The Products

Dietary Supplements for Health

health dotFIT

The goal of dietary supplements in this category is to help establish and preserve health or potentially stave off chronic or age-related disease by delivering important nutrient compounds[1] that may be unattainable from diet for any of the following reasons (also see Appendix 1: dotFIT Worldwide's Position on Vitamin & Mineral Supplementation):

- Insufficient food intake[2,3,4]
- Increased needs that are not met by diet alone[4,5,6,7,8,9,10,11,12,13,14]
- Special populations, age-related requirements or practicality of foods sources[13,14,15]
- Lack of interest in or avoidance of essential food groups[16,17,18,19,20,21,22,23]
- Low body fat maintenance[2,24,25,26]
- Variables of actual nutrient content of food[27,28,29,30]
- Unable to move enough to eat enough[31,32]
    - In the modern world, where many people maintain a sedentary lifestyle, maintaining a healthy weight often requires eating too few calories to get proper nutrition through food alone[31,32,33]
- Low sun exposure[14,34,35,36,37,38,39]
- Inability to define the perfect diet[40,41,42,43]

References

1 Murphy SP, White KK, Park SY, Sharma S. Multivitamin-multimineral supplements' effect on total nutrient intake. Am J Clin Nutr. 2007 Jan;85(1):280S-284S. Review.
2 Marra MV, Boyar AP. Position of the American Dietetic Association: nutrient supplementation. J Am Diet Assoc. 2009 Dec;109(12):2073-85.
3 Sebastian RS, Cleveland LE, Goldman JD, Moshfegh AJ. Older adults who use vitamin/mineral supplements differ from nonusers in nutrient intake adequacy and dietary attitudes. J Am Diet Assoc. 2007 Aug;107(8):1322-32.
4 Lee C, Majka DS. Is calcium and vitamin D supplementation overrated? J Am Diet Assoc. 2006 Jul;106(7):1032-4.
5 Blom HJ, Shaw GM, den Heijer M, Finnell RH. Neural tube defects and folate: case far from closed. Nat Rev Neurosci. 2006 Sep;7(9):724-31.
6 Shils ME, Vernon RY. Modern Nutrition in health and disease. 7th edition. Philadelphia PA: Lea and Febiger; 1988. 1694 p.
7 Winters LR, Yoon JS, Kalkwarf HJ, Davies JC, Berkowitz MG, Haas J, Roe DA. Riboflavin requirements and exercise adaptation in older women. Am J Clin Nutr 1992 Sep;56(3):526-32.
8 Campbell WW, Anderson RA. Effects of aerobic exercise and training on the trace minerals chromium, zinc and copper. Sports Med 1987 Jan-Feb;4(1):9-18.
9 Beals KA, Manore MM. Nutritional status of female athletes with subclinical eating disorders. J Am Diet Assoc 1998 Apr;98(4):419-25.
10 Manore MM. Chronic dieting in active women: what are the health consequences? Womens Health Issues 1996 Nov-Dec;6(6):332-41
11 Johnson MA. Nutrition and aging--practical advice for healthy eating. J Am Med Womens Assoc. 2004 Fall;59(4):262-9.
12 Calton JB. Prevalence of micronutrient deficiency in popular diet plans. J Int Soc Sports Nutr. 2010 Jun 10;7:24.
13 Harris WS, Appel LJ. New guidelines focus on fish, fish oil, omega-3 fatty acids. American Heart Association; http://www.americanheart.org/presenter.jhtml?identifier=3065754 2002(November 11)
14 Autier P, Gandini S. Vitamin D supplementation and total mortality: a meta-analysis of randomized controlled trials. Arch Intern Med. 2007 Sep 10;167(16):1730-7. Review.
15 Nutrition and Your Health: Dietary Guidelines for Americans, 2005. 6th ed. Washington, DC: US Government Printing Office; 2005.
16 Krebs-Smith SM, Guenther PM, Subar AF, Kirkpatrick SI, Dodd KW. Americans do not meet federal dietary recommendations. J Nutr. 2010 Oct;140(10):1832-8. Epub 2010 Aug 11.
17 Striegel-Moore RH, Thompson DR, Affenito SG, Franko DL, Barton BA, Schreiber GB, Daniels SR,

Schmidt M, Crawford PB. Fruit and vegetable intake: Few adolescent girls meet national guidelines. Prev Med. 2006 Mar;42(3):223-8. Epub 2006 Jan 10.
18 Serdula MK, Gillespie C, Kettel-Khan L, Farris R, Seymour J, Denny C. Trends in fruit and vegetable consumption among adults in the United States: behavioral risk factor surveillance system, 1994-2000. Am J Public Health. 2004 Jun;94(6):1014-8.
19 Economic Research Service, US Department of Agriculture. America's Eating Habits.: Changes and Consequences 1999. USDA/Economic Research Service, Washington D.C.
20 Kant AK. Reported consumption of low-nutrient-density foods by American children and adolescents: nutritional and health correlates, NHANES III, 1988 to 1994. Arch Pediatr Adolesc Med. 2003 Aug;157(8):789-96.
21 Nicklas TA, Weaver C, Britten P, Stitzel KF. The 2005 Dietary Guidelines Advisory Committee: developing a key message. J Am Diet Assoc. 2005 Sep;105(9):1418-24. Erratum in: J Am Diet Assoc. 2005 Dec;105(12):1869.
22 Fulgoni V 3rd, Nicholls J, Reed A, Buckley R, Kafer K, Huth P, DiRienzo D, Miller GD. Dairy consumption and related nutrient intake in African-American adults and children in the United States: continuing survey of food intakes by individuals 1994-1996, 1998, and the National Health And Nutrition Examination Survey 1999-2000. J Am Diet Assoc. 2007 Feb;107(2):256-64.
23 Krebs-Smith SM, Guenther PM, Subar AF, Kirkpatrick SI, Dodd KW. Americans do not meet federal dietary recommendations. J Nutr. 2010 Oct;140(10):1832-8. Epub 2010 Aug 11.
24 Beals KA. Eating behaviors, nutritional status, and menstrual function in elite female adolescent volleyball players. J Am Diet Assoc. 2002 Sep;102(9):1293-6.
25 Jonnalagadda SS, Bernadot D, Nelson M. Energy and nutrient intakes of the United States National Women's Artistic Gymnastics Team. Int J Sport Nutr. 1998 Dec;8(4):331-44.
26 Caine D, Lewis R, O'Connor P, Howe W, Bass S. Does gymnastics training inhibit growth of females? Clin J Sport Med. 2001 Oct;11(4):260-70. Review.
27 Clark LC; Combs GF Jr; Turnbull BW; Slate EH; Chalker DK; Chow J; Davis LS; Glover RA; Graham GF; Gross EG; Krongrad A; Lesher JL Jr; Park HK; Sanders BB Jr; Smith CL; Taylor JR. Effects of selenium supplementation for cancer prevention in patients with carcinoma of the skin. A randomized controlled trial. Nutritional Prevention of Cancer Study Group. JAMA 1996 Dec 25;276(24):1957-63.
28 Combs GF. The vitamin's functional aspects in nutrition and health. 2nd Edition. San Diego: Academic Press; 1988.
29 Agte V, Tarwadi K, Mengale S, Hinge A, Chiplonkar S. Vitamin profile of cooked foods: how healthy is the practice of ready-to-eat foods? Int J Food Sci Nutr. 2002 May;53(3):197-208.
30 Viadel B, Barbera R, Farre R. Effect of cooking and legume species upon calcium, iron and zinc uptake by Caco-2 cells. J Trace Elem Med Biol. 2006;20(2):115-20.
31 Ogden CL, Flegal KM, Carroll MD, Johnson CL. Prevalence and trends in overweight among US children and adolescents, 1999-2000. JAMA. 2002 Oct 9;288(14):1728-32.
32 Pennington J, Kandiah J, Nicklas T, Pitman S, Stitzel K. Practice paper of the American dietetic association: nutrient density: meeting nutrient goals within calorie needs. J Am Diet Assoc. 2007 May;107(5):860-9.
33 King JC. An evidence-based approach for establishing dietary guidelines. J Nutr.2007;137:480-483.
34 Reichrath J. The challenge resulting from positive and negative effects of sunlight: how much solar UV exposure is appropriate to balance between risks of vitamin D deficiency and skin cancer? Prog Biophys Mol Biol. 2006 Sep;92(1):9-16. Epub 2006 Feb 28. Review.
35 Kimlin MG, Schallhorn KA. Estimations of the human 'vitamin D' UV exposure in the USA. Photochem Photobiol Sci. 2004 Nov-Dec;3(11-12):1067-70. Epub 2004 Nov 17.
36 Kimlin MG, Olds WJ, Moore MR. Location and vitamin D synthesis: is the hypothesis validated by geophysical data? J Photochem Photobiol B. 2007 Mar 1;86(3):234-9. Epub 2006 Dec 4.
37 Holick MF. Vitamin D and sunlight: strategies for cancer prevention and other health benefits. Clin J Am Soc Nephrol. 2008 Sep;3(5):1548-54. Epub 2008 Jun 11.
38 Vieth R. What is the optimal vitamin D status for health? Prog Biophys Mol Biol. 2006 Sep;92(1):26-32. Review.
39 Holick MF. Sunlight and vitamin D for bone health and prevention of autoimmune diseases, cancers, and cardiovascular disease. Am J Clin Nutr. 2004 Dec;80(6 Suppl):1678S-88S. Review.
40 Dollahite J, Franklin D, McNew R. Problems encountered in meeting the Recommended Dietary Allowances for menus designed according to the Dietary Guidelines for Americans. J Am Diet Assoc 1995

Mar;95(3):341-4, 347.
41 Institute of Medicine. Dietary Reference Intakes Table – The Complete Set. Washington DC: National Academy Press; 2005. 1-7p.
42 Barratt J. Diet-related knowledge, beliefs and actions of health professionals compared with the general population: an investigation in a community Trust. J Hum Nutr Diet. 2001 Feb;14(1):25-32.
43 Russell R M. New views on the RDAs for older adults. J Am Diet Assoc 1997 May;97(5):515-8.

dotFIT Multivitamin & Mineral Formulas

Goal

The purpose of supplementing the diet with a properly designed multivitamin and mineral formula (MVM) should be to not only supply essential nutrients in an attempt to prevent nutrient deficiencies, but to also overcome marginal deficiencies from today's common limitations in obtaining sufficient and optimal nutrient intake.[1] Therefore, using the latest research and recommendations from the industry's leading experts,[2,3,4,5] the goal of the dotFIT multivitamin and mineral formulas (MVM) is to deliver a combination of nutrients in a controlled-release preparation that, when used properly, has the greatest chance helping stave off chronic disease, especially when compared to typical mass market formulas.

Rationale

Defining the perfect diet has been a laborious task for the nutritional sciences for decades. Likewise, specifying the optimal intake of vitamins and minerals is difficult in the face of continuing nutrient research. This makes giving concrete nutrient recommendations challenging. For most nutrients, there is a large therapeutic range within which the average person will receive benefit and simultaneously remain below the threshold that can yield adverse events. It is one matter to define nutrient recommendations, but another entirely more frustrating endeavor to actually consume the recommended dosages through the course of a normal day with typical foods.[1,4,5,7,8,9,10] The notion that food alone will satisfy all physiological needs of the body for proper and ideal nutrient intake is outdated.[11,12] Obstacles to proper eating and ideal nutrient intake include

- Insufficient food intake[2,5,13]
- Increased needs that are not met by diet alone[13,14,15,16,17,18,19,20,21,22]
- Lack of interest in or avoidance of essential food groups[1,26,27,28,29,30,31]
- Low body fat maintenance[3,32,33,34]
- Variables of actual nutrient content of food[35,36,37,38]
- Unable to move enough to eat enough[39,40]
- In the modern world, where many people maintain a sedentary lifestyle, maintaining a healthy weight often requires eating too few calories to get proper nutrition through food alone[39,40,41]
- Low sun exposure[23,42,43,44,45,46,47]
- Inability to define the perfect diet[48,49,50,51]

It is in the context of all the above that dotFIT multivitamin and mineral formulas are made, including the nutrient values contained in today's typical diet and the different overall nutrient needs based on age[24,52,53,54] gender and activity, each for a specific user.[2,3,4,9] The dotFIT multivitamin and mineral formulas are used at the specified times throughout one's lifetime. In addition, they include the coverage of an active person's basic antioxidant needs.

dotFIT formulas are engineered with ideal health and functioning as the goal, not the media driven need to see a lot of popular ingredients in a pill. An example is the decision to remove calcium from dotFIT MVM formulas.[55] Due to the variety of nutrients in a MVM, a decision has to be made if something goes in because it is needed (in the proper dosage) or if it is just "window dressing" (included but in an ineffective amount just so it can appear on the label). If one is failing at meeting their calcium needs through the diet, then a calcium supplement is warranted.[18,56,57,58,59] This required dose will far exceed that included in any effective MVM formula because it would make the MVM far too large to comfortably ingest. The dotFIT approach includes a specific calcium supplement to address that need. Also, calcium supplementation concurrent with iron supplementation can interfere with the absorption of iron.[60]

Another example of the dotFIT difference is that most experts believe the current recommendation for vitamin D is far too low, so dotFIT is taking the lead on ensuring optimal vitamin D intake.[61,62] More and more research is emerging linking low vitamin D status with numerous chronic health issues,[23,63,64] not just its relationship with calcium absorption. Population studies show that those with the lowest vitamin D intakes have a higher rate of mortality from all factors, especially cardiovascular disease and cancer.[46] Typical dosing with dotFIT MVM formulas will give the user a full 1000 IU.

The human digestive tract is a unique, amazing and dynamic environment. Due to varying pH levels and

availability of receptors, certain vitamins and minerals are best absorbed over time throughout many areas

of the digestive tract. A controlled-release delivery system not only ensures that nutrients make it through the harsh acid environment of the stomach (which is a digestive organ, not an absorptive one) but that that they are released overtime and in their proper forms.[52,65,66,67,68,69,70]

The goal is total tissue saturation with the nutrients needed to optimally perform all cellular activities, thus ensuring the cells have the potential to function at full capacity, 24 hours a day.

Table 1: dotFIT MVM Formulas & Ingredients (1 tablet)

Ingredient	Unit	Women's	Active	Over50	Kids
Vitamin A	IU	1000	500	1000	500
Vitamin D*	IU	1000	600	1000	250
Beta Carotene	IU	5000	4000	5000	2000
Vitamin C	mg	300	450	400	50
Iron	mg	10	5	8	5
Vitamin E	IU	100	150	50	20
Vitamin B1	mg	6	5	6	1
Vitamin B2	mg	6	5	6	1
Niacinamide	mg	20	15	20	6
Vitamin B6	mg	9	6	10	1
Folic Acid	mcg	400	100	400	100
Vitamin B12	mcg	12	15	100	3
Biotin	mcg	100	150	100	10
Pantothenic Acid	mg	15	0	10	2
Iodine	mcg	100	25	75	50
Magnesium	mg	100	150	100	20
Zinc	mg	12	7.5	15	5
Selenium	mcg	50	50	70	20
Copper	mg	0	.5	1	0
Chromium	mcg	50	50	100	0
Vitamin K	mcg	50	50	50	30

*Source: Cholecalciferol (D3), except for the Vegetarian, which is ergocalciferol (D2).

Table 2: dotFIT Multivitamin and Mineral Recommendations

	ActiveMV (1 tablet)	ActiveMV (2 tablets)	Women'sMV	Over50MV	KidsMV
Males/Females: 2-4 years of age					1 chewable
Males/Females: 5-11 years of age					2 chewables
Males: 12-17 years of age	X				
Males: 18-50 yrs (not athletes or intense exercisers)	X				
Males: 18-50 yrs who are athletes or intense exercisers		X			
Males: 51-64 yrs (not athletes or intense exercisers)				X	
Males: 51-64 yrs who are athletes or intense exercisers		X			
Males: 65+ years of age				X	
Females: 12-17 years of age	X				
Females: 18-50 yrs (not athletes or intense exercisers)			X		
Females: 18-50 yrs who are athletes or intense exercisers		X			
Females: 51-64 yrs (not athletes or intense exercisers)				X	
Females: 51-64 yrs who are athletes or intense exercisers (>150 lbs)		X			
Females: 65+ years of age				X	

Summary

Purpose

- dotFIT formulas can be used by EVERYONE unless instructed otherwise for medical reasons
- Based on the sophisticated controlled delivery systems and progressive formulations, dotFIT multivitamin and mineral formulas would be considered today's ideal formulation, especially when compared to popular common multivitamin products that must compete on price rather than efficacy

Unique Features

- All products are regularly updated with the most recent recommendations from the Institute of Medicine (IOM) and the industry's leading experts i.e. progressive evidence-based formulations
- All formulas are part of the dotFIT program for safe and ideal compatibility with all products when following program supplement recommendations
- Different formulas to meet the unique needs of different populations
- Formula and use follow strict scientific research criteria
- The nutrients are in their proper forms, ratios and strengths to help maintain a safe and optimal range 24 hours/day
- Uses the most sophisticated controlled-release delivery systems to ensure ideal nutrient levels and prevent tissue over-saturation and losses
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Precautions

dotFIT multivitamin and mineral formulas are considered safe for the general population at the proper dosage. Given the risk to benefit ratio, the long-term use of dotFIT multivitamin and mineral formulas is much safer than consuming the typical American diet without nutrient augmentation.[1,2,4,5,6]

Contraindications

dotFIT multivitamin and mineral formulas are contraindicated in pregnancy and lactation. Pregnant women should use a prenatal formula. Lactating women should use the Women'sMV formula unless advised otherwise by a physician. The dotFIT multivitamin and mineral formulas are contraindicated for those with hemochromatosis (an inherited disease that leads to iron-overload, affecting 0.5 percent of the population) because of the iron content, and for anyone suffering adverse reactions to any of the supplement's ingredients. The vitamin E content in two tablets per day may be contraindicated for those individuals taking blood-thinning medication. In all cases, consult with a physician. Smokers should stay below 66,000 IU of beta-carotene daily (the multivitamin formula contains less than 15,000 IU) until a dose can be established for them.

Adverse Reactions

At the recommended doses adverse effects are highly unlikely.

Upper Limit/Toxicity

See Table 3 for a list of known ULs and LOAELs for nutrients in the dotFIT multivitamin and mineral formulas. No nutrient in these formulas is above the UL or LOAEL.

Table 3: Safe and Probable Optimal Range including Food Sources

Nutrient	Low – High	Upper Limit (UL)	LOAEL
Pre-formed Vitamin A[1]	0 IU - 10,000 IU	10,000 IU (3000 mcg)	21,645 IU
Beta Carotene[2]	10,000 IU - 25,000 IU	-	-
Vitamin D (D3)	400 IU – 1500 IU	2000 IU	3800 IU*
Vitamin E	100 IU – 800 IU	1,500 IU (1000 mg)	-
Vitamin K	60-120 mcg	-	-
Vitamin C	200 mg – 1000 mg	2,000 mg	3,000 mg
Vitamin B1	2 mg – 30 mg	-	-
Vitamin B2	5 mg – 30 mg	-	-
Vitamin B3 (niacinamide)	30 mg – 50 mg	35 mg	1000 mg
Vitamin B6	6 mg – 50 mg	100 mg	500 mg
Folic acid	400 mcg – 900 mcg	1,000 mcg	5,000 mcg
Vitamin B12	6 mcg – 50 mcg	-	-
Calcium5	1200 mg – 2000 mg	2,500 mg	5,000 mg
Magnesium5	420 mg – 600 mg	350 mg4	350 mg
Iodine	150 mcg - ?	1,100 mcg	1,700 mcg
Iron5	15 mg – 25 mg	45 mg	70 mg
Zinc[3]	15 mg – 30 mg	40 mg	60 mg
Copper	2 mg – 4 mg	10 mg	-
Manganese	2 mg – 5 mg	11 mg	15 mg
Potassium	2000 mg -?	-	-

1. Supplemental amount can be zero if daily intake of beta carotene is within the safe and optimal range. 2. Smokers, those likely to develop, or those that already have lung cancer, should avoid beta carotene supplementation.* Currently being revisited. 3. Upper range amount is from supplements only. 4. From supplements only. 5. Supplemental amounts should be close to the low numbers shown.

ActiveMV™ Formula

The ActiveMV formula is a multipurpose multivitamin and mineral formula. At one pill daily, it is the basic multivitamin for everyone over 12 years of age. At two pills daily, it is designed for athletes and all others with an active lifestyle aged 18 to 65 (general population over age 50, see the Over50MV formula and women 18 to 50 years of age, see the Women'sMV formula) who consume the general variety of today's typically available foods.

Rationale

Studies suggest that athletes require additional vitamins due to increased energy demands.[21,71,72,73,74,75] Some, but not all, athletes consume more nutrients simply by eating more food. This assumes the athlete is on a relatively high-calorie, balanced diet thus able to consume enough nutritious food to match their energy expenditure. Athletes trying to lose weight/body fat or maintain low weight/fat represent a different category since they have increased requirements and a lower caloric intake, which can also lead to muscle loss as well as low nutrient intakes.[76,77,78] As such, the B vitamins are higher in this formula. Additionally, the ActiveMV formula contains doses of antioxidants at the higher end of the optimal range.[79] The ActiveMV dose for athletes is two pills daily, one in the morning with a meal and the other at night with a meal, to maintain the ideal nutrient levels in all tissues all day, every day.

Typical Use

- For all persons with an active lifestyle, 12-65 years of age, except those who are pregnant, trying to conceive or lactating
  - One tablet per day before or after main meal with a favorite beverage
- Active athletes and exercisers, two tablets per day before or after main meal with a favorite beverage

Supplement Facts

Serving Size: 1 Tablet — Servings Per Container: 30

Amount Per Serving		% Daily Value*
Vitamin A (as Beta Carotene 4,000 IU and Acetate 500 IU)	4,500 IU	90%*
Vitamin C (as Ascorbic acid)	450 mg	750%*
Vitamin D (as Cholecalciferol)	600 IU	150%*
Vitamin E (as D-Alpha Tocopheryl Succinate)	150 IU	500%*
Vitamin K (as Phytonadione)	50 mcg	63%*
Vitamin B1 (as Thiamine Mononitrate)	5 mg	333%*
Vitamin B2 (as Riboflavin)	5 mg	294%*
Niacin (as Niacinamide)	15 mg	75%*
Vitamin B6 (as Pyridoxine HCl)	6 mg	300%*
Folic Acid	100 mcg	25%*
Vitamin B12 (as Cyanocobalamin)	15 mcg	250%*
Biotin	150 mcg	50%*
Iron (as Ferrous Fumarate)	5 mg	28%*
Iodine (from Kelp)	25 mcg	17%*
Magnesium (as Magnesium Oxide)	150 mg	38%*
Zinc (as Zinc Citrate)	7.5 mg	50%*
Selenium (as L-Selenomethionine)	50 mcg	71%*
Copper (as Copper Gluconate)	500 mcg	25%*
Chromium (as Chromium Picolinate)	50 mcg	42%*

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Di-Calcium Phosphate, Stearic acid (Vegetable source), Hydroxypropylmethylcellulose, Microcrystalline Cellulose, Magnesium Stearate (Vegetable source), Silicon Dioxide, Xanthan gum.

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten.
No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.

References

1 Krebs-Smith SM, Guenther PM, Subar AF, Kirkpatrick SI, Dodd KW. Americans do not meet federal dietary recommendations. J Nutr. 2010 Oct;140(10):1832-8. Epub 2010 Aug 11.
2 Institute of Medicine. Dietary Reference Intakes Table – The Complete Set. Washington DC: National Academy Press; 2008. 1-7p.
3 Marra MV, Boyar AP. Position of the American Dietetic Association: nutrient supplementation. J Am Diet Assoc. 2009 Dec;109(12):2073-85.
4 Hathock JN. Vitamins and mineral Safety. 2nd Edition. Council for Responsible Nutrition. 2004.
5 Sebastian RS, Cleveland LE, Goldman JD, Moshfegh AJ. Older adults who use vitamin/mineral supplements differ from nonusers in nutrient intake adequacy and dietary attitudes. J Am Diet Assoc. 2007 Aug;107(8):1322-32.
6 Dollahite J, Franklin D, McNew R. Problems encountered in meeting the Recommended Dietary Allowances for menus designed according to the Dietary Guidelines for Americans. J Am Diet Assoc 1995 Mar;95(3):341-4, 347; quiz 345-6.
7 Department of Agriculture (US). What We Eat in America, NHANES 2001-2002: Usual Nutrient Intakes from Food Compared to Dietary Reference Intakes. September 2005.
8 Department of Agriculture (US). Continuing survey of food intakes by individuals (CSFII): diet and health knowledge survey. 1996 (Magnetic tape).
9 Hathock JN. Vitamins and minerals: efficacy and safety. Am J Clin Nutr 1997 Aug; 66(2):427-37.
10 Fairfield KM, Fletcher RH. Vitamins for chronic disease prevention in adults: scientific review. JAMA. 2002 Jun 19;287(23):3116-26. Review. Erratum in: JAMA 2002 Oct 9;288(14):1720.
11 Ames BN. Low micronutrient intake may accelerate the degenerative diseases of aging through allocation of scarce micronutrients by triage. Proc Natl Acad Sci U S A. 2006 Nov 21;103(47):17589-94. Epub 2006 Nov 13. Review.
12 Peterson S, Sigman-Grant M, Eissenstat B, Kris-Etherton P. Impact of adopting lower-fat food choices on energy and nutrient intakes of American adults. J Am Diet Assoc. 1999 Feb;99(2):177-83.
13 Lee C, Majka DS. Is calcium and vitamin D supplementation overrated? J Am Diet Assoc. 2006 Jul;106(7):1032-4.
14 Blom HJ, Shaw GM, den Heijer M, Finnell RH. Neural tube defects and folate: case far from closed. Nat Rev Neurosci. 2006 Sep;7(9):724-31.
15 Shils ME, Vernon RY. Modern Nutrition in health and disease. 7th edition. Philadelphia PA: Lea and Febiger; 1988. 1694 p.
16 Winters LR, Yoon JS, Kalkwarf HJ, Davies JC, Berkowitz MG, Haas J, Roe DA. Riboflavin requirements and exercise adaptation in older women. Am J Clin Nutr 1992 Sep;56(3):526-32.
17 Campbell WW, Anderson RA. Effects of aerobic exercise and training on the trace minerals chromium, zinc and copper. Sports Med 1987 Jan-Feb;4(1):9-18.
18 Beals KA, Manore MM. Nutritional status of female athletes with subclinical eating disorders. J Am Diet Assoc 1998 Apr;98(4):419-25.
19 Manore MM. Chronic dieting in active women: what are the health consequences? Womens Health Issues 1996 Nov-Dec;6(6):332-41
20 Johnson MA. Nutrition and aging--practical advice for healthy eating. J Am Med Womens Assoc. 2004 Fall;59(4):262-9.
21 Calton JB. Prevalence of micronutrient deficiency in popular diet plans. J Int Soc Sports Nutr. 2010 Jun 10;7:24.
22 Harris WS, Appel LJ. New guidelines focus on fish, fish oil, omega-3 fatty acids. American Heart Association; http://www.americanheart.org/presenter.jhtml?identifier=3065754 2002(November 11)
23 Autier P, Gandini S. Vitamin D supplementation and total mortality: a meta-analysis of randomized controlled trials. Arch Intern Med. 2007 Sep 10;167(16):1730-7. Review.
24 Nutrition and Your Health: Dietary Guidelines for Americans, 2005. 6th ed. Washington, DC: US Government Printing Office; 2005.
25 Murphy SP, White KK, Park SY, Sharma S. Multivitamin-multimineral supplements' effect on total nutrient intake. Am J Clin Nutr. 2007 Jan;85(1):280S-284S. Review.
26 Striegel-Moore RH, Thompson DR, Affenito SG, Franko DL, Barton BA, Schreiber GB, Daniels SR, Schmidt M, Crawford PB. Fruit and vegetable intake: Few adolescent girls meet national guidelines. Prev Med. 2006 Mar;42(3):223-8. Epub 2006 Jan 10.
27 Serdula MK, Gillespie C, Kettel-Khan L, Farris R, Seymour J, Denny C. Trends in fruit and vegetable

consumption among adults in the United States: behavioral risk factor surveillance system, 1994-2000. Am J Public Health. 2004 Jun;94(6):1014-8.
28 Economic Research Service, US Department of Agriculture. America's Eating Habits.: Changes and Consequences 1999. USDA/Economic Research Service, Washington D.C.
29 Kant AK. Reported consumption of low-nutrient-density foods by American children and adolescents: nutritional and health correlates, NHANES III, 1988 to 1994. Arch Pediatr Adolesc Med. 2003 Aug;157(8):789-96.
30 Nicklas TA, Weaver C, Britten P, Stitzel KF. The 2005 Dietary Guidelines Advisory Committee: developing a key message. J Am Diet Assoc. 2005 Sep;105(9):1418-24. Erratum in: J Am Diet Assoc. 2005 Dec;105(12):1869.
31 Fulgoni V 3rd, Nicholls J, Reed A, Buckley R, Kafer K, Huth P, DiRienzo D, Miller GD. Dairy consumption and related nutrient intake in African-American adults and children in the United States: continuing survey of food intakes by individuals 1994-1996, 1998, and the National Health And Nutrition Examination Survey 1999-2000. J Am Diet Assoc. 2007 Feb;107(2):256-64.
32 Beals KA. Eating behaviors, nutritional status, and menstrual function in elite female adolescent volleyball players. J Am Diet Assoc. 2002 Sep;102(9):1293-6.
33 Jonnalagadda SS, Bernadot D, Nelson M. Energy and nutrient intakes of the United States National Women's Artistic Gymnastics Team. Int J Sport Nutr. 1998 Dec;8(4):331-44.
34 Caine D, Lewis R, O'Connor P, Howe W, Bass S. Does gymnastics training inhibit growth of females? Clin J Sport Med. 2001 Oct;11(4):260-70. Review.
35 Clark LC; Combs GF Jr; Turnbull BW; Slate EH; Chalker DK; Chow J; Davis LS; Glover RA; Graham GF; Gross EG; Krongrad A; Lesher JL Jr; Park HK; Sanders BB Jr; Smith CL; Taylor JR. Effects of selenium supplementation for cancer prevention in patients with carcinoma of the skin. A randomized controlled trial. Nutritional Prevention of Cancer Study Group. JAMA 1996 Dec 25;276(24):1957-63.
36 Combs GF. The vitamin's functional aspects in nutrition and health. 2nd Edition. San Diego: Academic Press; 1988.
37 Agte V, Tarwadi K, Mengale S, Hinge A, Chiplonkar S. Vitamin profile of cooked foods: how healthy is the practice of ready-to-eat foods? Int J Food Sci Nutr. 2002 May;53(3):197-208.
38 Viadel B, Barbera R, Farre R. Effect of cooking and legume species upon calcium, iron and zinc uptake by Caco-2 cells. J Trace Elem Med Biol. 2006;20(2):115-20.
39 Ogden CL, Flegal KM, Carroll MD, Johnson CL. Prevalence and trends in overweight among US children and adolescents, 1999-2000. JAMA. 2002 Oct 9;288(14):1728-32.
40 Pennington J, Kandiah J, Nicklas T, Pitman S, Stitzel K. Practice paper of the American dietetic association: nutrient density: meeting nutrient goals within calorie needs. J Am Diet Assoc. 2007 May;107(5):860-9.
41 King JC. An evidence-based approach for establishing dietary guidelines. J Nutr.2007;137:480-483.
42 Reichrath J. The challenge resulting from positive and negative effects of sunlight: how much solar UV exposure is appropriate to balance between risks of vitamin D deficiency and skin cancer? Prog Biophys Mol Biol. 2006 Sep;92(1):9-16. Epub 2006 Feb 28. Review.
43 Kimlin MG, Schallhorn KA. Estimations of the human 'vitamin D' UV exposure in the USA. Photochem Photobiol Sci. 2004 Nov-Dec;3(11-12):1067-70. Epub 2004 Nov 17.
44 Kimlin MG, Olds WJ, Moore MR. Location and vitamin D synthesis: is the hypothesis validated by geophysical data? J Photochem Photobiol B. 2007 Mar 1;86(3):234-9. Epub 2006 Dec 4.
45 Holick MF. Vitamin D and sunlight: strategies for cancer prevention and other health benefits. Clin J Am Soc Nephrol. 2008 Sep;3(5):1548-54. Epub 2008 Jun 11.
46 Vieth R. What is the optimal vitamin D status for health? Prog Biophys Mol Biol. 2006 Sep;92(1):26-32. Review.
47 Holick MF. Sunlight and vitamin D for bone health and prevention of autoimmune diseases, cancers, and cardiovascular disease. Am J Clin Nutr. 2004 Dec;80(6 Suppl):1678S-88S. Review.
48 Dollahite J, Franklin D, McNew R. Problems encountered in meeting the Recommended Dietary Allowances for menus designed according to the Dietary Guidelines for Americans. J Am Diet Assoc 1995 Mar;95(3):341-4, 347.
49 Institute of Medicine. Dietary Reference Intakes Table – The Complete Set. Washington DC: National Academy Press; 2005. 1-7p.
50 Barratt J. Diet-related knowledge, beliefs and actions of health professionals compared with the general population: an investigation in a community Trust. J Hum Nutr Diet. 2001 Feb;14(1):25-32.

51 Russell R M. New views on the RDAs for older adults. J Am Diet Assoc 1997 May;97(5):515-8.
52 Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Washington, DC: National Academies Press; 1998.
53 Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes for Calcium, Phosphorus, Magnesium, Vitamin D, and Fluoride. Washington, DC: National Academies Press; 1997.
54 Lichtenstein AH, Rasmussen H, Yu WW, Epstein SR, Russell RM. Modified MyPyramid for older adults. J Nutr. 2008;138:5-11.
55 Marra MV, Wellman NS. Multivitamin— Mineral supplements in the Older Americans Act Nutrition Program: Not a one-sizefits- all quick fix. Am J Public Health. 2008; 98:1171-1176.
56 The Report of the Dietary Guidelines Advisory Committee on Dietary Guidelines for Americans, 2005. US Department of Health and Human Services Web site. http://www. health.gov/DietaryGuidelines/dga2005/report/. Accessed May 12, 2009.
57 National Institutes of Health State-of-the- Science conference statement: Multivitamin/ multimineral supplements and chronic disease prevention. Ann Intern Med. 2006; 145:364-371.
58 Cranney A, Horsley T, O'Donnell S, Weiler HA, Puil L, Ooi DS, Atkinson SA, Ward LM, Moher D, Hanley DA, Fang M, Yazdi F, Garritty C, Sampson M, Barrowman N, Tsertsvadze A, Mamaladze V. Effectiveness and Safety of Vitamin D in Relation to Bone Health. Evidence Report/Technology Assessment No. 158. Rockville, MD: Agency for Healthcare Research and Quality; 2007. AHRQ Publication No. 07-E013.
59 Troppmann L, Gray-Donald K, Johns T. Supplement use: is there any nutritional benefit? J Am Diet Assoc. 2002 Jun;102(6):818-25.
60 Hallberg L. Does calcium interfere with iron absorption? Am J Clin Nutr. 1998 Jul;68(1):3-4.
61 Bischoff-Ferrari HA, Giovannucci E, Willett WC, Dietrich T, Dawson-Hughes B. Estimation of optimal serum concentrations of 25- hydroxyvitamin D for multiple health outcomes. Am J Clin Nutr. 2006;84:18-28.
62 Hathcock JN, Shao A, Vieth R, Heaney R. Risk assessment for vitamin D. Am J Clin Nutr. 2007;85:6-18.
63 Huotari A, Herzig KH. Vitamin D and living in northern latitudes--an endemic risk area for vitamin D deficiency. Int J Circumpolar Health. 2008 Jun;67(2-3):164-78. Review.
64 Lips P. Vitamin D physiology. Prog Biophys Mol Biol. 2006 Sep;92(1):4-8. Epub 2006 Feb 28. Review.
65 Cranney A, Horsley T, O'Donnell S, Weiler HA, Puil L, Ooi DS, Atkinson SA, Ward LM, Moher D, Hanley DA, Fang M, Yazdi F, Garritty C, Sampson M, Barrowman N, Tsertsvadze A, Mamaladze V. Effectiveness and Safety of Vitamin D in Relation to Bone Health. Evidence Report/Technology Assessment No. 158. Rockville, MD: Agency for Healthcare Research and Quality; 2007. AHRQ Publication No. 07-E013.
66 Dietary supplement fact sheet: Magnesium. Office of Dietary Supplements Web site. http://ods.od.nih.gov/factsheets/magnesium.asp. Accessed July 8, 2009.
67 Armas LAG, Hollis BW, Heaney RP. Vitamin D2 is much less effective than vitamin D3 in humans. J Clin Endocrinol Metab. 2004;89:5387-5391.
68 Wood RJ, Serfaty-Lacrosniere C. Gastric acidity, atrophic gastritis, and calcium absorption. Nutr Rev. 1992;50:33-40.
69 Goss SL, Lemons KA, Kerstetter JE, Bogner RH. Determination of calcium salt solubility with changes in pH and P(CO(2)), simulating varying gastrointestinal environments. J Pharm Pharmacol. 2007; 59:1485-1492.
70 Dietary supplement fact sheet: Calcium. Office of Dietary Supplements Web site. http:// ods.od.nih.gov/factsheets/calcium.asp. Accessed July 8, 2009.
71 Willis KS, Peterson NJ, Larson-Meyer DE. Should we be concerned about the vitamin D status of athletes? Int J Sport Nutr Exerc Metab. 2008 Apr;18(2):204-24. Review.
72 Whiting SJ, Barabash WA. Dietary Reference Intakes for the micronutrients: considerations for physical activity. Appl Physiol Nutr Metab. 2006 Feb;31(1):80-5.
73 Mehlenbeck RS, Ward KD, Klesges RC, Vukadinovich CM. A pilot intervention to increase calcium intake in female collegiate athletes. Int J Sport Nutr Exerc Metab. 2004 Feb;14(1):18-29.
74 Clark M, Reed DB, Crouse SF, Armstrong RB. Pre- and post-season dietary intake, body composition, and performance indices of NCAA division I female soccer players. Int J Sport Nutr Exerc Metab. 2003 Sep;13(3):303-19.
75 Manore MM. Dietary recommendations and athletic menstrual dysfunction. Sports Med. 2002;32(14):887-901. Review.
76 Berning JR: Energy intake, diet, and muscle wasting. Overtraining in Sport Champaign: Human Kinetics

Kreider RB, Fry AC, O'Toole ML 1998, 275-88.

77 Peterson S, Sigman-Grant M, Eissenstat B, Kris-Etherton P. Impact of adopting lower-fat food choices on energy and nutrient intakes of American adults. J Am Diet Assoc. 1999 Feb;99(2):177-83.
78 Position of the American Dietetic Association: Fortification and Nutritional Supplements. J Am Diet Assoc. 2005; 105(8): 1300-1311
79 Lowery L, Berardi JM, Ziegenfuss TAntioxidants: Sports Supplements. Baltimore, MD: Lippincott, Williams & WilkinsAntonio J, Stout J 2001, 260-78.

Women'sMV™ Formula

The Women'sMV formula was created for women younger than 50 years of age who are not pregnant or trying to conceive.

Rationale

This formula was designed with the specific needs of females[1,2,3,4] in mind by including slightly higher levels of magnesium, iron and folic acid and the proper extra nutrients for lactating women not needing the higher iron found in a prenatal formula.

Typical Use

- For use by women 13-50 years of age not using the ActiveMV™ formula
- Non-pregnant females not trying to conceive
- One tablet per day before or after main meal with a favorite beverage

Supplement Facts

Serving Size: 1 Tablet
Servings Per Container: 60

	Amount Per Serving	% Daily Value
Vitamin A (as Beta Carotene 5,000 IU and Acetate 1,000 IU)	6,000 IU	120%*
Vitamin C (as Ascorbic acid)	300 mg	500%*
Vitamin D (as Cholecalciferol)	1,000 IU	250%*
Vitamin E (as D-Alpha Tocopheryl Succinate)	100 IU	333%*
Vitamin K (as Phytonadione)	50 mcg	63%*
Vitamin B1 (as Thiamine Mononitrate)	6 mg	400%*
Vitamin B2 (as Riboflavin)	6 mg	353%*
Niacinamide	20 mg	100%*
Vitamin B6 (as Pyridoxine HCl)	9 mg	450%*
Folic Acid	400 mcg	100%*
Vitamin B12 (as Cyanocobalamin)	12 mcg	200%*
Biotin	100 mcg	33%*
Pantothenic Acid (as D-Calcium Pantothenate)	15 mg	150%*
Iron (as Ferrous Fumarate)	10 mg	56%*
Iodine (from Kelp)	100 mcg	67%*
Magnesium (as Magnesium Oxide)	100 mg	25%*
Zinc (as Zinc Citrate)	12 mg	80%*
Selenium (as L-Selenomethionine)	50 mcg	71%*
Chromium (as Chromium Picolinate)	50 mcg	42%*

*Percent Daily Values are based on a 2,000 calorie diet.
** % Daily Value not established.

Other Ingredients: Dibasic Calcium Phosphate, Microcrystalline Cellulose, Croscarmellose Sodium, Stearic acid, Magnesium Stearate Silicon Dioxide, Talc, Wax, Hypromellose, Polyethylene Glycol/Macrogol.

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts or Soy.
No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.

Storage Conditions: Store in a cool, dry place.

References

1 Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes: Applications in Dietary Assessment. Washington, DC: National Academies Press; 2000.
2 Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes: The Essential Guide to Nutrient Requirements. Washington, DC: National Academies Press; 2006.
3 Institute of Medicine. Dietary Reference Intakes table—The complete set. Institute of Medicine Web site. http://www.iom.edu/Global/News%20Announcements/~/media/474B28C39EA34C43A60A6D42CCE07427.ashx. Updated May 3, 2005. Accessed October 26, 2010.
4 Pinto E, Barros H, Dos Santos Silva I. Dietary intake and nutritional adequacy prior to conception and during pregnancy: a follow-up study in the north of Portugal. Public Health Nutr. 2008 Aug 27:1-10. [Epub ahead of print]

Over50MV™ Formula

The Over50MV formula is for the general population over 50 years of age, and for athletes and intense exercisers over 65 years of age.

Rationale

This formula considers the requirements[1,2,3] of older individuals in helping to combat potentially preventable diseases such as dementia, osteoporosis and heart disease.[4,5] It contains optimal doses of Folate, B6 and B12[6,7] along with bone-building nutrients such as Vitamin D, Vitamin A (also beta carotene) and even Vitamin K.[8,9] This formula should be used with 1000 mg of calcium from food or supplements.

Typical Use

- For the general population over 50 years of age
- Individuals using ActiveMV formula would switch to the Over50MV formula at age 65
- One tablet per day before or after main meal with a favorite beverage

Supplement Facts

Serving Size: 1 Tablet — Servings Per Container: 60

Amount Per Serving		% Daily Value*
Vitamin A (as Beta Carotene 5,000 IU and Acetate 1,000 IU)	6,000 IU	120%*
Vitamin C (as Ascorbic acid)	400 mg	667%*
Vitamin D (as Cholecalciferol)	1,000 IU	250%*
Vitamin E (as D-Alpha Tocopheryl Succinate)	50 IU	167%*
Vitamin K (as Phytonadione)	50 mcg	63%*
Vitamin B1 (as Thiamine Mononitrate)	6 mg	400%*
Vitamin B2 (as Riboflavin)	6 mg	353%*
Niacin (as Niacinamide)	20 mg	100%*
Vitamin B6 (as Pyridoxine HCl)	10 mg	500%*
Folic Acid	400 mcg	100%*
Vitamin B12 (as Cyanocobalamin)	100 mcg	1,667%*
Biotin	100 mcg	33%*
Pantothenic Acid (as Calcium Pantothenate)	10 mg	100%*
Iron (as Ferrous Fumarate)	8 mg	44%*
Iodine (from Kelp)	75 mcg	50%*
Magnesium (as Magnesium Oxide)	100 mg	25%*
Zinc (as Zinc Citrate)	15 mg	100%*
Selenium (as L-Selenomethionine)	70 mcg	100%*
Copper (as Copper Gluconate)	1 mg	50%*
Chromium (as Chromium Picolinate)	100 mcg	83%*

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Microcrystalline Cellulose, Croscarmellose Sodium, Dibasic Calcium Phosphate, Stearic acid, Silicon Dioxide, Magnesium Stearate

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.

Storage Conditions: Store in a cool, dry place.

References

1 Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes: Applications in Dietary Assessment. Washington, DC: National Academies Press; 2000.
2 Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes: The Essential Guide to Nutrient Requirements. Washington, DC: National Academies Press; 2006.
3 Institute of Medicine. Dietary Reference Intakes table—The complete set. Institute of Medicine Web site. http://www.iom.edu/Global/News%20Announcements/~/media/474B28C39EA34C43A60A6D42CCE07427.ashx. Updated May 3, 2005. Accessed October 26, 2010.
4 Sebastian RS, Cleveland LE, Goldman JD, Moshfegh AJ. Older adults who use vitamin/mineral supplements differ from
nonusers in nutrient intake adequacy and dietary attitudes. J Am Diet Assoc. 2007 Aug;107(8):1322-32.
5 Ervin RB, Kennedy-Stephenson J. Mineral intakes of elderly adult supplement and non-supplement users in the third national
health and nutrition examination survey. J Nutr. 2002 Nov;132(11):3422-7.
6 Kimberly A Skarupski, Christine Tangney, Hong Li, Bichun Ouyang, Denis A Evans, and Martha Clare Morris Longitudinal association of vitamin B-6, folate, and vitamin B-12 with depressive symptoms among

older adults over time. Am J Clin Nutr 2010 92: 330-335.
7 Bamini Gopinath, Victoria M. Flood, Elena Rochtchina, Catherine M. McMahon, and Paul Mitchell Serum Homocysteine and Folate Concentrations Are Associated with Prevalent Age-Related Hearing Loss. J. Nutr. 2010 140: 1469-1474.
8 Katharina Nimptsch, Sabine Rohrmann, Rudolf Kaaks, and Jakob Linseisen Dietary vitamin K intake in relation to cancer incidence and mortality: results from the Heidelberg cohort of the European Prospective Investigation into Cancer and Nutrition (EPIC-Heidelberg). Am J Clin Nutr 2010 91: 1348-1358.
9 M Kyla Shea, Christopher J O'Donnell, Udo Hoffmann, Gerard E Dallal, Bess Dawson-Hughes, José M Ordovas, Paul A Price, Matthew K Williamson, and Sarah L Booth Vitamin K supplementation and progression of coronary artery calcium in older men and women. Am J Clin Nutr 2009 89: 1799-1807.

KidsMV™

Goal

The goal of the KidsMV formula is to provide the nutrients a growing child needs and often does not get in sufficient amounts[1,2,3] due to myriad factors such as poor food choices, lack of interest in certain foods or food groups and picky eating behavior.[4] There are windows of opportunity for intellectual and physical growth from infancy through adolescence. A child whose diet is not nutritionally complete during these critical periods will not be able to compensate for the loss at another time.

Rationale

Children generally need more nutrient-dense foods in their diets due to smaller amounts of food consumed at meals.[5,6] A child's diet may lack essential nutrients for a number of reasons. For example there are very few dietary sources of vitamin D other than fatty fish and liver, which are uncommon in a young child's diet.[7] Not surprisingly, children tend to avoid nutritious foods.[8,9,10,11,12,13,14,15] They commonly gravitate towards empty-calorie foods, such as cookies, crackers and candies.[4,16,17] Eating this type of food generally depresses a child's appetite for healthier foods. Pediatricians may advise parents of poor eaters that their children will eat when they're hungry. This advice may alleviate a parent's concern, but it could result in an undernourished child. Children who do not receive proper levels of all nutrients do not have the potential to develop and function optimally. Although vitamin deficiency is uncommon in the United States, insufficiency or marginal deficiency is widespread[18] which could have profound health consequences later in life.[19] In fact recently, supplementation with multivitamins during the first years of life have been found to possibly reduce the risk of allergic disease at school age.[20]

Children with substandard daily diets find it difficult to produce academic performance equal to their counterparts who consume diets that come closer to the suggested RDAs. In a well-designed study by Schoenthaler et al., children using a multivitamin and mineral supplement (MVM) who raised their nutrient intake to the equivalent of a well-balanced diet increased their I.Q. compared to the placebo group by an average of two-point-five points. In one-fifth of the participants, the MVM raised their I.Q. 16 points, presumably because this group of children ate a poorer diet.[21] More recently, research suggests that MVM supplementation improves brain function (spatial working memory) in children.[7,22,23]

A daily multivitamin and mineral formula helps children receive the nutrients their diet may lack.[4] Giving a child a multivitamin does not decrease the importance of eating healthy foods and establishing good eating patterns, nor can a multivitamin and mineral formula replace the nutritional value of food, but it can supplement a diet lacking essential nutrients.

The American Academy of Pediatrics now recommends that infants, children and adolescents obtain 400 international units (IU) of vitamin D every day, which is double the previous recommendation.[19] This guideline is based on recent evidence that children and adolescents may not be getting enough of this vitamin, and the occurrence of extreme vitamin D deficiency (rickets) among infants and adolescents in the United States is of particular concern. The safety of giving infants and children 400 IU of vitamin D per day has also been established[24,25] and research indicates that getting enough calcium and vitamin D throughout childhood reduces the risk of osteoporosis and other diseases later in life.[26]

Typical Use

- All children ages two to 11 unless a specific medical condition prohibits the proper intake of any nutrient contained in the formula
- Ages two to four take one daily
- Ages five to 11 take two daily
- Ages 12 to 17 use one adult ActiveMV™ multivitamin and mineral tablet

Precautions

The dotFIT KidsMV™ is considered safe for healthy users at the proper dosage. Given the ratio of risk to benefit, the long-term use of this formula is much safer than consuming the typical American diet without nutrient augmentation.[24,27]

Contraindications

The KidsMV is contraindicated for those with hemochromatosis because of the iron content. The KidsMV is also contraindicated for anyone suffering adverse reactions to any of its ingredients. Consult with a physician for drug/nutrient interactions.

Adverse Reactions

At the recommended dosages side effects would be highly unlikely.

Upper Limit/Toxicity

No nutrient in these formulas is above the UL or LOAEL for children.

Summary

Purpose

- Replaces all multivitamin and mineral formulas
- Specific formulas to complement an individual's food intake in an attempt to satisfy nutritional requirements and increase cellular efficiency without adding calories
- Maintain a safe, optimal nutrient intake 24 hours per day
- Nutritional insurance from normal dietary shortcomings due to food preferences, nutrient availability and inability to define the perfect diet

Unique Features

- Formula and use follow strict and updated scientific research criteria for all youth ages
- Uniquely formulated to maintain a safe and optimal range of nutrients when combined with other dotFIT products
- The nutrients are in their proper forms, ratios and strengths to complement food intake and help maintain a safe and optimal range for 24 hours per day
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Supplement Facts

Serving Size: 1 Tablet — Servings Per Container: 60

	Amount Per Serving	%Daily Value Children <4	%Daily Value Children & Adults >4
Vitamin A (as Beta-Carotene 2,000 IU and Retinyl Palmitate 500 IU)	2,500 IU	100%	50%
Vitamin C (as Ascorbic Acid)	50 mg	125%	83%
Vitamin D (as cholecalciferol)	250 IU	63%	63%
Vitamin E (as D-Alpha-Tocopheryl Succinate)	20 IU	200%	67%
Vitamin K (as Phytonadione)	30 mcg	*	38%
Thiamin (as Thiamin Mononitrate)	1 mg	143%	67%
Riboflavin	1 mg	125%	59%
Niacin (as Niacinamide)	6 mg	67%	30%
Vitamin B6 (as Pyridoxine HCl)	1 mg	143%	50%
Folate (as Folic Acid)	100 mcg	50%	25%
Vitamin B12 (as Cyanocobalamin)	3 mcg	100%	50%
Biotin	10 mcg	7%	3%
Pantothenic acid (as D-Calcium Pantothenate)	2 mg	40%	20%
Iron (as Ferrous Fumarate)	5 mg	50%	28%
Iodine (as Potassium Iodide)	50 mcg	71%	33%
Magnesium (as Magnesium Oxide)	20 mg	10%	5%
Zinc (as Zinc Oxide)	5 mg	63%	30%
Selenium (as Selenomethionine)	20 mcg	*	29%

* % Daily Value based on a 2,000 calorie diet.
** Daily Value not established.

Other Ingredients: Xylitol, Sucrose, Oligofructose, Natural Favor, Grape Skin Extract, Citric acid, Magnesium Stearate and Silica.

References

1 Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes: Applications in Dietary Assessment. Washington, DC: National Academies Press; 2000.
2 Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes: The Essential Guide to Nutrient Requirements. Washington, DC: National Academies Press; 2006.
3 Institute of Medicine. Dietary Reference Intakes table—The complete set. Institute of Medicine Web site. http://www.iom.edu/Global/News%20Announcements/~/media/474B28C39EA34C43A60A6D42CCE07427.ashx. Updated May 3, 2005. Accessed October 26, 2010.
4 Reedy J, Krebs-Smith SM. Dietary sources of energy, solid fats, and added sugars among children and adolescents in the United States. J Am Diet Assoc. 2010 Oct;110(10):1477-84.
5 Curran JS, Barness LA. Nutritional requirements. In: Behrman RE, Kliegman RM, Jenson HB, eds. Textbook of Pediatrics, 16th ed. Philadelphia, PA: WB Saunders Company; 2000:138-142.
6 Kranz S, Hartman T, Siega-Riz AM, Herring AH. A diet quality index for American preschoolers based on current dietary intake recommendations and an indicator of energy balance. J Am Diet Assoc. 2006 Oct;106(10):1594-604.
7 Greer FR. 25-Hydroxyvitamin D: functional outcomes in infants and young children. Am J Clin Nutr. 2008 Aug;88(2):529S-533S. Review.
8 Munoz KA, Krebs-Smith SM, Ballard-Barbash R, Cleveland LE. Food intakes of US children and adolescents compared with recommendations. Pediatrics. 1997;100: 323-329. Erratum in: 1998;101: 952-953.
9 Carlson A, Lino M, Gerrior S, Basiotis P. Report card on the diet quality of children ages 2 to 9. In: Nutrition Insights. USDA Center for Policy and Promotion, September 2001.
10 Guenther PM, Dodd KW, Reedy J, Krebs- Smith SM. Most Americans eat much less than recommended amounts of fruits and vegetables. J Am Diet Assoc. 2006;106:1371- 1379.
11 US Department of Health and Human Services. Healthy People 2010 [conference edition in two volumes]. Healthy People 2010 Web site. http://www.health.gov/healthypeople. Accessed May 19, 2007.
12 Harnack L, Walters SA, Jacobs DR Jr. Dietary intake and food sources of whole grains among US children and adolescents: Data from the 1994-1996 Continuing Survey of Food Intakes by Individuals. J Am Diet Assoc. 2003;103:1015-1019.
13 Morton JF, Guthrie JF. Changes in children's total fat intakes and their food group sources of fat, 1989-91 versus 1994-95: Implications for diet quality. Family Econ Nutr Rev. 1998;11:45-57.
14 Striegel-Moore RH, Thompson DR, Affenito SG, Franko DL, Barton BA, Schreiber GB, Daniels SR, Schmidt M, Crawford PB. Fruit and vegetable intake: Few adolescent girls meet national guidelines. Prev Med. 2006 Mar;42(3):223-8. Epub 2006 Jan 10.
15 Position of the American Dietetic Association: Dietary guidance for healthy children ages 2 to 11 years. Journal of the American Dietetic Association. April 2004. Vol. 104, Issue 4, Pages 660-677.
16 LaRowe TL, Moeller SM, Adams AK. Beverage patterns, diet quality, and body mass index of US preschool and school-aged children. J Am Diet Assoc. 2007 Jul;107(7):1124-33.
17 RA, Storey ML. The role of added sugars in the diet quality of children and adolescents. J Am Coll Nutr. 2001;20:32-43.
18 Rovner AJ, O'Brien KO. Hypovitaminosis D among healthy children in the United States: a review of the current evidence. Arch Pediatr Adolesc Med. 2008 Jun;162(6):513-9. Review.
19 American Academy of Pediatrics. "New Guidelines Double Amount Of Recommended Vitamin D For Young." Science Daily 14 October 2008. 14 October 2008 <http://www.sciencedaily.com /releases/2008/10/081013141737.htm>.
20 Marmsjö K, Rosenlund H, Kull I, Håkansson N, Wickman M, Pershagen G, Bergström A. Use of multivitamin supplements in relation to allergic disease in 8-y-old children. Am J Clin Nutr. 2009 Dec;90(6):1693-8. Epub 2009 Oct 28.
21 Schoenthaler SJ, Bier ID, Young K, Nichols D, Jansenns S. The effect of vitamin-mineral supplementation on the intelligence of American schoolchildren: a randomized, double-blind placebo-controlled trial. J Altern Complement Med. 2000 Feb;6(1):19-29.
22 Lamberg-Allardt CJ, Viljakainen HT. 25-Hydroxyvitamin D and functional outcomes in adolescents. Am J Clin Nutr. 2008 Aug;88(2):534S-536S. Review.
23 Haskell CF, Scholey AB, Jackson PA, Elliott JM, Defeyter MA, Greer J, Robertson BC, Buchanan T, Tiplady B, Kennedy DO. Cognitive and mood effects in healthy children during 12 weeks' supplementation with multi-vitamin/minerals. Br J Nutr. 2008 Nov;100(5):1086-96. Epub 2008 May 29.
24 Hathock JN. Vitamins and mineral Safety. 2nd Edition. Council for Responsible Nutrition. 2004.

25 Perrine CG, Sharma AJ, Jefferds ME, Serdula MK, Scanlon KS. Adherence to vitamin D recommendations among US infants. Pediatrics. 2010 Apr;125(4):627-32. Epub 2010 Mar 22.
26 Holick MF. Vitamin D: Evolutionary, Physiological and Health Perspectives. Curr Drug Targets. 2010 Aug 27. [Epub ahead of print]
27 Department of Agriculture (US). What We Eat in America, NHANES 2001-2002: Usual Nutrient Intakes from Food Compared to Dietary Reference Intakes. September 2005.

SuperCalcium+™

Goal

According to the National Center for Health Statistics (NCHS), most Americans do not meet the Adequate Intake Values of calcium[1,2] or the current higher recommendation of vitamin D. Female adolescents have the lowest intake overall.[3] Natural food sources of vitamin D are scarce, and dependence on the sun's rays present several problems e.g. skin color, fears of skin cancer, sunburns, etc.[4,5,6,7,8,9] Less than adequate intake of these essential micronutrients may lead to osteoporosis,[10,11] hip fractures, falls in the elderly[12] and specific cancers.[13,14] Supplementation of calcium in combination with vitamin D can supply the proper amounts of these essential nutrients to help prevent and/or slow the progression of these conditions.[15,16,17] The objective of Super Calcium+ is to supply the body with specific amounts of calcium carbonate[18,19] for maximum absorption along with vitamin D and magnesium for improved utilization in order to meet the body's established needs that are generally not met through diet alone.

Rationale

Calcium: The skeletal system accounts for 20 percent of the adult human body's weight and serves as a major reservoir for calcium. The adolescent years represent a critical period for bone mineral accrual with rapid gains occurring until age 16.[20,21] If one doesn't maximize bone building during this period, equivalent increase cannot be made up for later in life making proper calcium intake of great importance. To make matters worse, as we age, the calcium content of bone begins to decline, increasing the likelihood of fractures. When this critical "breaking point" is reached, the condition is known as osteoporosis. This disease affects millions of Americans each year, causing approximately one-point-five million bone fractures (over 250,000 involve the hip) at a cost of $12-18 billion.[11] Fall-related injuries are a leading cause of morbidity and mortality in older adults.[10] Supplying adequate amounts of calcium as we age may minimize the loss of this important mineral and prevent loss of bone mass.[10,11,16] Besides its function in bone, calcium is required for such essential functions as nerve conduction, muscle contraction and blood clotting.[22] Properly prepared calcium carbonate has been shown to have superior absorption, especially with food.[18] It also has the highest content of calcium by weight (so less is needed) and its cost is less than other forms.[19] Additionally calcium carbonate is 40% calcium by weight while calcium citrate is only 21%.[23,24]

Vitamin D: Recently there has been a steady stream of research on the benefits of vitamin D. Solid evidence shows that it is just as important as calcium in building and maintaining strong bones by increasing the absorption of calcium.[7,25] Many other tissues in the body have receptor sites for vitamin D, providing proof that it confers other important health benefits.[7] It plays a role in building muscle strength which may protect elderly people from falling and bone fractures.[26,27,28,29,30,31] In 2005, it was concluded in the *American Journal of Public Health* that vitamin D substantially reduced the risk of for breast, colon, prostate, and ovarian cancer.[32]

Calcium and Vitamin D: Scientific research has found an inverse relationship between calcium and vitamin D intake and breast cancer in women.[33,34,35,36] Calcium by itself may have a protective effect against colon cancer.[37,38] Although the exact mechanism behind calcium and vitamin D's cancer-fighting properties has yet to be discovered, it would be beneficial to maintain adequate levels of these two micronutrients. There should be no reason to take calcium by itself; it should always be accompanied with vitamin D.[39,40]

The significant departure in adulthood from the use of dairy products (especially milk) and the warnings on sun exposure to all have significantly reduced the ability of the U.S. population to acquire adequate levels of calcium and vitamin D without supplementation.

Magnesium: Magnesium is necessary for the secretion of parathyroid hormone (PTH).[41] This hormone aids in calcium utilization.[41] The average American diet lacks magnesium; magnesium is therefore included in this formula.[42]

Given the overall positive findings, including the dramatically increased recommendations of vitamin D, maintaining adequate intakes of calcium and vitamin D throughout life may be a useful strategy for the

prevention and management of osteoporosis, bone fractures, falls in the elderly and specific cancers.

Typical Use

- Anyone not meeting the recommended intakes of calcium and vitamin D through diet or adequate sun exposure
- As a dietary supplement, take one or two tablets daily with meals to meet calcium and vitamin D requirements

Precautions

Chronic calcium supplementation is considered safe at doses up to 2500 mg/day.[43] Currently the upper limit for vitamin D is 2000IU due to toxicities that can occur when taken in higher doses. Large doses of calcium and iron can compete for absorption, resulting in a slightly lower absorption of iron.[44]

Contraindications

The use of calcium supplements by those with a history of kidney stones has varied results. Some individuals with a history of stones will benefit from the supplementation of calcium with food as it aids in the removal of oxalates. However, those with absorptive hypercalciuria may have an increased risk of stone formation.[45,46] Consult with a physician when a history of kidney stones exists, or when taking these drugs: biphosphonates,[47] hydrogen blockers, levothyroxine,[47] proton pump inhibitors, quinolones[48] and tetracyclines.[49]

Adverse Reactions

Side effects from calcium supplementation are rare, mild, and usually limited to gas, bloating and constipation.[49]

Upper Limit/Toxicity

The National Academy of Sciences (NAS) Food and Nutrition Board (FNB) has set the upper limit for chronic calcium ingestion at 2500 mg/day and vitamin D at 2000 IU/day. The Lowest Observed Adverse Effect Level (LOAEL) is 5000 mg/day for calcium and 3800 IU/day for vitamin D.

Summary

Purpose

- Based on the current scientific data, the formula, dotFIT Super Calcium+™ would be considered an ideal choice, especially when compared to other common calcium products that must compete on price rather than efficacy
- Super Calcium+ is one component in the dotFIT longevity program, which is made available to all program users and will appear on the website

Unique Features

- Contains calcium, magnesium and vitamin D, which have been shown to be crucial for proper calcium utilization
- Calcium and magnesium are prepared in their proper forms designed to optimize delivery and utilization
- This formula considers use of other dotFIT products in order to allow the user to maintain a safe and optimal range of total nutrient intake
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Supplement Facts

Serving Size: 2 Tablets — Servings Per Container: 60

Amount Per Serving		% Daily Value*
Vitamin D (as Cholecalciferol)	400 IU	100%*
Calcium (as Carbonate)	1,000 mg	100%*
Magnesium (as Oxide)	500 mg	125%*

Other Ingredients: Hydroxypropyl Methylcellulose, Microcrystalline Cellulose, Stearic Acid (Vegetable Source), Magnesium Stearate (Vegetable Source)

Contains No: Dairy, Fish, Crustacean Shellfish, Tree Nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial coloring, Flavoring or Preservatives added.

References

1 Forshee RA, Anderson PA, Storey ML. Changes in calcium intake and association with beverage consumption and demographics: comparing data from CSFII 1994-1996, 1998 and NHANES 1999-2002.
2 Ma J, Johns RA, Stafford RS. Americans are not meeting current calcium recommendations. Am J Clin Nutr. 2007 May; 85(5): 1361-6.
3 Yetley EA. Assessing the vitamin D status of the US population. Am J Clin Nutr. 2008 Aug;88(2):558S-564S. Review.
4 Mattila P, Piironen V, Uusi-Rauva E, Koivistoinen P. Cholecalciferol and 25-hydroxycholecalciferol contents in fish and fish products. J Food Comp Anal 1995;8:232– 43.
5 Calvo MS, Whiting SJ, Barton CN. Vitamin D fortification in the United States and Canada: current status and data needs. Am J Clin Nutr. 2004 Dec;80(6 Suppl):1710S-6S. Review.
6 Holden JM, Lemar LE. Assessing vitamin D contents in foods and supplements: challenges and needs. Am J Clin Nutr. 2008 Aug;88(2):551S-553S. Review.
7 Brannon PM, Yetley EA, Bailey RL, Picciano MF. Overview of the conference "Vitamin D and Health in the 21st Century: an Update". Am J Clin Nutr. 2008 Aug;88(2):483S-490S.
8 Aloia JF. African Americans, 25-hydroxyvitamin D, and osteoporosis: a paradox. Am J Clin Nutr. 2008 Aug;88(2):545S-550S. Review.
9 Cranney A, Horsley T, O'Donnell S, Weiler H, Puil L, Ooi D, Atkinson S, Ward L, Moher D, Hanley D, Fang M, Yazdi F, Garritty C, Sampson M, Barrowman N, Tsertsvadze A, Mamaladze V. Effectiveness and safety of vitamin D in relation to bone health. Evid Rep Technol Assess (Full Rep). 2007 Aug;(158):1-235. Review.
10 Dontas IA, Yiannakopoulos CK. Risk factors and prevention of osteoporosis-related fractures. J Musculoskelet Neuronal Interact. 2007 Jul-Sep;7(3):268-72. Review.
11 Gass M, Dawson-Hughes B. Preventing osteoporosis-related fractures: an overview. Am J Med. 2006 Apr;119(4 Suppl 1):S3- S11. Review.
12 Cauley JA, Lacroix AZ, Wu L, Horwitz M, Danielson ME, Bauer DC, Lee JS, Jackson RD, Robbins JA, Wu C, Stanczyk FZ, LeBoff MS, Wactawski-Wende J, Sarto G, Ockene J, Cummings SR. Serum 25-hydroxyvitamin D concentrations and risk for hip fractures. Ann Intern Med. 2008 Aug 19;149(4):242-50.
13 Holick MF. Sunlight and vitamin D for bone health and prevention of autoimmune diseases, cancers, and cardiovascular disease. Am J Clin Nutr. 2004 Dec;80(6 Suppl):1678S-88S. Review.
14 Holick MF. Sunlight and vitamin D for bone health and prevention of autoimmune diseases, cancers, and cardiovascular disease.
Am J Clin Nutr. 2004 Dec;80(6 Suppl):1678S-88S. Review.
15 Sahota O. Osteoporosis and the role of vitamin D and calcium-vitamin D deficiency, vitamin D insuf

ficiency and vitamin D sufficiency. Age Ageing. 2000 Jul;29(4):301-4. Review.

16 Heaney RP, Weaver CM. Calcium and vitamin D. Endocrinol Metab Clin North Am. 2003 Mar;32(1):181-94, vii-viii. Review.
17 Burnett-Hartman AN, Fitzpatrick AL, Gao K, Jackson SA, Schreiner PJ. Supplement use contributes to meeting recommended dietary intakes of calcium, magnesium, and vitamin C in four ethnicities of middle-aged and older Americans: the Multi-Ethnic Study of Ahtlerosclerosis. J Am Diet Assoc. 2009 Mar; 109(3): 422-9.
18 Heaney RP, Dowell MS, Barger-Lux MJ. Absorption of calcium as the carbonate and citrate salts, with some observations on method. Osteoporos Int. 1999;9:19 23.
19 Heaney RP, Dowell MS, Bierman J, Hale CA, Bendich A. Absorbability and cost effectiveness in calcium supplementation. J Am Coll Nutr. 2001 Jun; 20(3): 239-46.
20 Sabatier JP, Guaydier-Souquières G, Benmalek A, Marcelli C. Evolution of lumbar bone mineral content during adolescence and adulthood: a longitudinal study in 395 healthy females 10-24 years of age and 206 premenopausal women. Osteoporos Int. 1999;9(6):476-82.
21 Davies JH, Evans BA, Gregory JW. Bone mass acquisition in healthy children. Arch Dis Child. 2005 Apr;90(4):373-8. Review.
22 Groff JL, Gropper SS. Advanced Nutrition and Human Metabolism. St. Paul:West Publishing Company;2000. pp. 377-380.
23 Hendler S, Rorvick D, eds. Calcium. In: PDR for Nutritional Supplements. Montvale, NJ: Medical Economics, Thomson Healthcare; 2001:74–79.
24 Straub DA. Calcium supplementation in clinical practice: a review of forms, doses and indications. Nutr Clin Pract. 2007 Jun; 22(3): 286-96.
25 Norman AW. From vitamin D to hormone D: fundamentals of the vitamin D endocrine system essential for good health. Am J Clin Nutr. 2008 Aug;88(2):491S-499S. Review.
26 Bischoff-Ferrari HA, Orav EJ, Dawson-Hughes B. Effect of cholecalciferol plus calcium on falling in ambulatory older men and women: a 3-year randomized controlled trial. Arch Intern Med. 2006 Feb 27;166(4):424-30.
27 Bischoff-Ferrari HA, Dawson-Hughes B, Willett WC, Staehelin HB, Bazemore MG, Zee RY, Wong JB. Effect of Vitamin D on falls: a meta-analysis. JAMA. 2004 Apr 28;291(16):1999-2006. Review.
28 Broe KE, Chen TC, Weinberg J, Bischoff-Ferrari HA, Holick MF, Kiel DP. A higher dose of vitamin d reduces the risk of falls in nursing home residents: a randomized, multiple-dose study. J Am Geriatr Soc. 2007 Feb;55(2):234-9.
29 Flicker L, MacInnis RJ, Stein MS, Scherer SC, Mead KE, Nowson CA, Thomas J, Lowndes C, Hopper JL, Wark JD. Should older people in residential care receive vitamin D to prevent falls? Results of a randomized trial. J Am Geriatr Soc. 2005 Nov;53(11):1881-8.
30 Sato Y, Iwamoto J, Kanoko T, Satoh K. Low-dose vitamin D prevents muscular atrophy and reduces falls and hip fractures in women after stroke: a randomized controlled trial. Cerebrovasc Dis. 2005;20(3):187-92. Epub 2005 Jul 27.
31 Dawson-Hughes B. Serum 25-hydroxyvitamin D and functional outcomes in the elderly. Am J Clin Nutr. 2008 Aug;88(2):537S- 540S. Review.
32 Garland CF, Garland FC, Gorham ED, Lipkin M, Newmark H, Mohr SB, Holick MF. The role of vitamin D in cancer prevention. Am J Public Health. 2006 Feb;96(2):252-61. Epub 2005 Dec 27. Review.
33 Bérubé S, Diorio C, Mâsse B, Hébert-Croteau N, Byrne C, Côté G, Pollak M, Yaffe M, Brisson J. Vitamin D and calcium intakes from food or supplements and mammographic breast density. Cancer Epidemiol Biomarkers Prev. 2005 Jul;14(7):1653-9.
34 Bérubé S, Diorio C, Verhoek-Oftedahl W, Brisson J. Vitamin D, calcium, and mammographic breast densities. Cancer Epidemiol Biomarkers Prev. 2004 Sep;13(9):1466-72.
35 Lin J, Manson JE, Lee IM, Cook NR, Buring JE, Zhang SM. Intakes of calcium and vitamin D and breast cancer risk in women. Arch Intern Med. 2007 May 28;167(10):1050-9.
36 Lappe JM, Travers-Gustafson D, Davies KM, Recker RR, Heaney RP. Vitamin D and calcium supplementation reduces cancer risk: results of a randomized trial. Am J Clin Nutr. 2007 Jun;85(6):1586-91. Erratum in: Am J Clin Nutr. 2008 Mar;87(3):794.
37 Oh K, Willett WC, Wu K, Fuchs CS, Giovannucci EL. Calcium and vitamin D intakes in relation to risk of distal colorectal adenoma in women. Am J Epidemiol. 2007 May 15;165(10):1178-86. Epub 2007 Mar 22.
38 Giovannucci E. Epidemiological evidence for vitamin D and colorectal cancer. J Bone Miner Res. 2007 Dec;22 Suppl 2:V81-5. Review.

39 Bolland MJ, Avenell A, Baron JA, Grey A, MacLennan GS, Gamble GD, Reid IR. Effect of calcium supple-

ments on risk of myocardial infarction and cardiovascular events: meta-analysis. BMJ. 2010 Jul 29;341:c3691. doi: 10.1136/bmj.c3691. Review.
40 Lappe J, Cullen D, Haynatzki G, Recker R, Ahlf R, Thompson K. Calcium and vitamin d supplementation decreases incidence of stress fractures in female navy recruits. J Bone Miner Res. 2008 May;23(5):741-9.
41 Groff JL, Gropper SS. Advanced Nutrition and Human Metabolism. St. Paul: West Publishing Company;2000. pp. 390-91.
42 Ford ES, Mokdad AH. Dietary magnesium intake in a national sample of US adults. J Nutr. 2003 Sep;133(9):2879-82.
43 Food and Nutrition Board, Institute of Medicine. Dietary Reference Intakes for Calcium, Phosphorus, Magnesium, Vitamin D, and Fluoride. Washington, DC: National Academy Press, 1999. Available at: http://books.nap.edu/books/0309063507/html/index.html.
44 Minihane AM, Fairweather-Tait SJ. Effect of calcium supplementation on daily nonheme-iron absorption and long-term iron status. Am J Clin Nutr 1998;68:96-102.
45 Sarubin A. The Health Professional's Guide to Popular Dietary Supplements. Chicago: The American Dietetic Association; 2000. 452 p.
46 Pietrow PK, Karellas ME. Medical management of common urinary calculi. Am Fam Physician. 2006 Jul 1;74(1):86-94. Review.
47 Peters ML, Leonard M, Licata AA. Role of alendronate and risedronate in preventing and treating osteoporosis. Cleve Clin J Med 2001;68:945-51.
48 Murry JJ, Healy MD. Drug-mineral interactions: a new responsibility for the hospital dietician. J Am Diet Assoc 1991;91:66-73.
49 Maton PN, Burton ME. Antacids revisited: a review of their clinical pharmacology and recommended therapeutic use. Drugs 1999;57:855-70.

SuperiorAntioxidant™

Goal

Excess free radicals are caused by normal biological processes, exercise, and the environment and have been linked to the aging process. This formula is used to increase the intake of nutrients that have been shown to help contain free radical production. The goal of reducing free radicals is to stave off the cellular damage they cause and potentially reduce the risk of chronic or age-related diseases. This includes improving the maintenance of eye health, protecting against heart disease, cognitive decline and certain cancers.

Rationale

Carotenes: Four of the antioxidants in this formula belong to a class of compounds called carotenes. Carotenes are plant pigments that result in the yellow, orange and red colors of fruits and vegetables. Only 34 of the 600 known carotenoids have been found in human serum. Several carotenoids can be converted by the body to vitamin A. These carotenoids, ß-carotene, alpha-carotene and ß-cryptoxanthin are called provitamin A carotenoids. Carotenoids that do not convert to vitamin A, such as lutein, lycopene and zeaxanthin, are called non-provitamin A carotenoids. These six carotenoids are the most abundant in the American diet. Carotenoid absorption requires the presence of fat in a meal. As little as three to five grams of fat in a meal appears sufficient to ensure carotenoid absorption.[1] Because they do not need to be released from the plant matrix, carotenoids supplements are more efficiently absorbed than carotenoids in foods. Carotenoids facilitate intercellular communication by increasing the expression of the gene encoding a connexin protein.[2] This type of intercellular communication is important for maintaining cells in a differentiated state and is often lost in cancer cells. Recently, high circulating levels of carotenoids have demonstrated an inverse relationship with cardiovascular disease and specifically hypertension.[3]

Alpha-Carotene: Alpha-carotene is a fat-soluble compound present in cell membranes. It has the ability to quench singlet oxygen and other free radicals. Recently, the intake of alpha-carotene has been associated with a lower risk for breast[4] and lung cancers[5,6] and may offer protection against colorectal and prostate cancers[7,8] coronary artery disease[9,10,11] and ischemic stroke. Alpha-carotene can also inhibit the oxidation of fats (lipid peroxidation) under certain conditions.[12]

Lutein/Zeaxanthin: Lutein and Zeaxanthin are similar structures. The difference lies in the orientation of a single bond, making them geometric isomers. They are the only carotenoids found in the human eye, predominately in the macula of the retina.[13] The macula is responsible for central vision and acuity. Both compounds serve as blue light and near-ultraviolet radiation filters, protecting underlying ocular tissues from damage. Both lutein and zeaxanthin effectively quench free radicals.[14,15]

Clinical trials clearly show that supplementation with lutein and/or zeaxanthin increases macular pigmentation.[13,16,17,18,18,20] Lutein and zeaxanthin may protect against eye diseases such as cataract formation and age-related macular degeneration (AMD),[16,20,21,22,23,24] the leading cause of vision loss in the United States.[23]

Lycopene: Lycopene is the most effective carotenoid at quenching the free radical singlet oxygen. Lycopene gives tomatoes their red color. Lycopene is more bioavailable from processed tomato products such as ketchup, tomato juice and pizza sauce than the fresh, whole food. The intake of lycopene is associated with a significantly lower risk for prostate cancer, a leading cause of cancer death in the United States.[26,27] Lycopene may also protect against heart disease[28,29,30,31,32] and other cancers.[33,34] The intake of lycopene from supplements increases the level of lycopene in humans.[35]

Conclusions from a growing collection of placebo-controlled trials suggest that consumption of lycopene (either as a dietary supplement or in the form of processed tomatoes) can reduce DNA damage and may have beneficial effects on prostate cancer.[36,37]

Coenzyme Q-10: Coenzyme Q-10 (CoQ-10) is part of the ubiquinone family and is involved in energy production in the electron transport chain. It is a fat-soluble substance, providing protection for cell

membranes against oxidation. CoQ-10 also prevents the oxidation of LDL cholesterol,[38,39,40,41] which is thought to contribute to the formation of atherosclerosis.[42] In humans, CoQ-10 levels decrease with age. Therefore, presumably because of CoQ-10's essential role as an electron carrier in mitochondrial oxidative phosphorylation, supplementation with CoQ-10 and other antioxidants has recently been shown to increase the elasticity of large and small arteries[43] thus further demonstrating that CoQ-10 may support cardiovascular health.[44,45] Recent research shows that CoQ-10 has the ability to reduce fatigue in endurance activity as well as reduce markers of muscle damage from intense exercise.

Alpha-Lipoic Acid: Alpha-lipoic acid is a part of energy producing cycles (enzyme systems) in the body and is a "universal antioxidant." It scavenges the major free radicals: hydrogen peroxide, singlet oxygen, hydroxyl radical, nitric oxide radical, hypochlorous acid, and peroxynitrite. It can also regenerate other antioxidants (vitamins C and E) in the body. It is therefore protective against oxidative damage[46,47] and may play a role in disease prevention.[48] Alpha-lipoic acid is being extensively researched for several disease states including diabetic peripheral neuropathy, heart disease, obesity-related disease, and memory loss reduction.[49,50]

Optiberry® Mix: OptiBerry is a standardized, multiple berry anthocyanin extract formulated and tested for optimum safety, bioavailability, antioxidant and anti-angiogenic (the ability to reduce unwanted growth of blood vessels, which may lead to varicose veins and tumor formation) activity. Lutein, Zeaxanthin and berry extracts are used in the Age-Related Eye Disease Study (AREDS) formula, which is the only formula shown effective at helping prevent age-related macular degeneration (AMD).[51] OptiBerry® contains a unique, proprietary blend of wild blueberry, strawberry, cranberry, wild bilberry, elderberry and raspberry extracts (patent-pending), which are known for their health-promoting properties due to their high content of anthocyanins.[52] Anthocyanins also help maintain DNA integrity, serve as anti-inflammatory and antimutagenic agents,[53] and provide cardioprotection by maintaining vascular permeability.[54] OptiBerry® is the result of extensive scientific research, which methodically evaluated key functional parameters, including ORAC (antioxidant activity), VEGF (anti-angiogenic activity), bioavailability and safety of numerous individual berry extracts.

Typical Use

- Everyone, exercisers and non-exercisers, interested in reducing the ravages of free radical damage and optimal health and functioning and reducing the risk of chronic disease such as cancers and heart disease
- Intense exercisers to reduce the increased free radical production and damage associated with intense and prolonged training bouts
- One softgel per day before or after main meal with a favorite beverage
- Can be combined with a dotFIT® multivitamin

Precautions

The SuperiorAntioxidant™ is considered safe for the general population at the proper dosage in healthy users. Given the ratio of risk to benefit, the long-term use of a dotFIT multivitamin with the SuperiorAntioxidant is much safer than consuming the typical American diet without nutrient augmentation.[55,56,57.58.59]

CoQ10: Consult a physician if taking warfarin and/or other blood thinning medications. Individuals with cancer should consult their physician before taking the SuperiorAntioxidant formula as high dosages of CoQ-10 decrease the effectiveness of radiation therapy in mice.[60] CoQ-10 has been thought to alter glycemic control and insulin requirements in diabetic individuals; however, CoQ-10 supplementation does not appear to alter glycemic control or insulin requirements.[61,62] In either case, diabetics should consult their physician before using the SuperiorAntioxidant.

Alpha-lipoic acid: Has been well-tolerated in clinical studies lasting from four months to two years at the suggested dose of one to three tablets per day (200 to 600 mg/day).[63,64,65] Studies of lipoic acid supplementation in people with conditions like Type II diabetes and peripheral arterial disease have reported potential minor side effects such as tingling in legs and feet and mild stomach queasiness. However, it was difficult to know if this was caused by the supplement or the condition.[66]

Contraindications

The dotFIT SuperiorAntioxidant™ formula is contraindicated in pregnancy and lactation and for anyone suffering adverse reactions to any of the ingredients. Pregnant or lactating females should use only a prenatal multivitamin-and-mineral formula.

Adverse Reactions

There should be no serious side effects in healthy users at the recommended doses.

Alpha-lipoic acid: Side effects are usually not seen unless dosage exceeds 600 mg/day. Reported reactions include headache, skin rash and stomach upset.[66,67]

Lutein/zeaxanthin: None reported.

Lycopene: None reported.

CoQ-10: Symptoms of gastrointestinal distress have been reported with dosages of 200 mg or more, which is unlikely to occur at the present dose of 30 mg/day.

Upper Limit/Toxicity

The National Academy of Sciences has not set an upper limit (UL) for any of the ingredients contained in the dotFIT SuperiorAntioxidant formula.

Alpha-lipoic acid: No upper limit has been established for human use. A two-year study of laboratory rats reported a no-observed-adverse-effect level (NOAEL) of 60 mg per kilogram body weight.[68] The dose in the dotFIT SuperiorAntioxidant is less than one-tenth of this dose.

Lutein/zeaxanthin: UL data is not available at this time. Human clinical trials have used doses up to 40 mg/day without any adverse or toxicological effects.[59] An upper limit has yet to be established.

Lycopene: There have been no reports of adverse or toxicological effects with doses as high as 150 mg/day.[59] An upper limit has yet to be established.

CoQ-10: Evidence from randomized human clinical trials indicates that the UL for CoQ-10 is 1200 mg. There have been no reports of toxicity in studies lasting up to 30 months.[69]

OptiBerry®: Acute oral LD (50) of OptiBerry® was greater than 5 g/kg in rats. No human data is available at this time.[53]

Summary

Purpose

- Intense, prolonged exercise, normal biological processes, etc., can increase free radical production and damage. The goal of the SuperiorAntioxidant™ is to reduce free radical damage and optimize health and functioning while reducing the risk of certain chronic diseases such as brain, eye and heart disease
- A complement to the dotFIT multivitamin and mineral formulas
- The SuperiorAntioxidant is one component of the dotFIT longevity program which is made available to all program users and appears on the website

Unique Features

- Contains only the most effective researched antioxidants in their proper amounts
- Accurately complements the dotFIT multivitamin formulas
- Softgel preparation for improved absorption of C0Q-10, mixed carotenoids, lutein & zeaxanthin
- Uses the OptiBerry® blend which is clinically proven to have superior antioxidant activity

- This formula considers use of other dotFIT products to help maintain a safe and optimal range of total nutrient intake
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Supplement Facts

Serving Size: 1 Softgel

Amount Per Serving	% Daily Value *	
Alpha Lipoic Acid	200 mg	**
Co-Enzyme Q10 (CoQ-10)	100 mg	**
OptiBerry (from wild blueberry, strawberry, cranberry, wild bilberry, elderberry, raspberry)	30 mg	**
Lycopene	10 mg	**
Lutein	6 mg	**
Zeaxanthin	4 mg	**
D. Salina natural mixed carotenoids	1,5 mg	**

Other Ingredients: Soybean oil, Gelatin, Glycerin, Bee's Wax, Lecithin, Caramel color, Titanium Dioxide, Silicon Dioxide

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, or Gluten. No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.

References

1 van Het Hof KH, West CE, Weststrate JA, Hautvast JG. Dietary factors that affect the bioavailability of carotenoids. J Nutr. 2000;130(3):503-506.
2 Stahl W, Nicolai S, Briviba K, Hanusch M, Broszeit G, Peters M, Martin HD, Sies H. Biological activities of natural and synthetic carotenoids: induction of gap junctional communication and singlet oxygen quenching. Carcinogenesis. 1997 Jan;18(1):89-92.
3 Hozawa A, Jacobs DR Jr, Steffes MW, Gross MD, Steffen LM, Lee DH. Circulating carotenoid concentrations and incident hypertension: the Coronary Artery Risk Development in Young Adults (CARDIA) study. J Hypertens. 2009 Feb;27(2):237-42.
4 Larsson SC, Bergkvist L, Wolk A. Dietary carotenoids and risk of hormone receptor-defined breast cancer in a prospective cohort of Swedish women. Eur J Cancer. 2010 Apr;46(6):1079-85. Epub 2010 Jan 28.
5 Mannisto S, Smith-Warner SA, Spiegelman D, et al. Dietary Carotenoids and Risk of Lung Cancer in a Pooled Analysis of Seven Cohort Studies. Cancer Epidemiol Biomarkers Prev. 2004;13(1):40-48.
6 Veeramachaneni S, Wang XD. Carotenoids and lung cancer prevention. Front Biosci (Schol Ed). 2009 Jun 1;1:258-74.
7 Zhang J, Dhakal I, Stone A, Ning B, Greene G, Lang NP, Kadlubar FF. Plasma carotenoids and prostate cancer: a populationbased case-control study in Arkansas. Nutr Cancer. 2007;59(1):46-53.
8 Chang S, Erdman JW Jr, Clinton SK, Vadiveloo M, Strom SS, Yamamura Y, Duphorne CM, Spitz MR, Amos CI, Contois JH, Gu X, Babaian RJ, Scardino PT, Hursting SD. Relationship between plasma carotenoids and prostate cancer. Nutr Cancer. 2005;53(2):127-34.
9 Wang L, Gaziano JM, Norkus EP, Buring JE, Sesso HD. Associations of plasma carotenoids with risk factors and biomarkers related to cardiovascular disease in middle-aged and older women. Am J Clin Nutr. 2008 Sep;88(3):747-54.
10 Buijsse B, Feskens EJ, Kwape L, Kok FJ, Kromhout D. Both alpha- and beta-carotene, but not tocopherols and vitamin C, are inversely related to 15-year cardiovascular mortality in Dutch elderly men. J Nutr. 2008 Feb;138(2):344-50.
11 Hozawa A, Jacobs DR Jr, Steffes MW, Gross MD, Steffen LM, Lee DH. Relationships of circulating carotenoid concentrations with several markers of inflammation, oxidative stress, and endothelial dysfunction: the Coronary Artery Risk Development in Young Adults (CARDIA)/Young Adult Longitudinal Trends in Antioxidants (YALTA) study. Clin Chem. 2007 Mar;53(3):447-55. Epub 2007 Jan 18.
12 Bub A, Watzl B, Abrahamse L, et al. Moderate intervention with carotenoid-rich vegetable products reduces lipid peroxidation in men. J Nutr 2000;130:2200–6.
13 Johnson EJ, Hammond BR, Yeum KJ, Qin J, Dong Wang X, Castaneda C, Snodderly DM, Russell RM. Relation among serum and tissue concentrations of lutein and zeaxanthin and macular pigment density. Am J Clin Nutr 2000;71:1555-62.
14 Palozza P, Krinsky NI. Antioxidant effects of carotenoids in vivo and in vitro: an overview. In Methods

in Enzymology Vol 213. San Diego: Academic Press; 1992. Pp 403-420.
15 Bernstein PS, Khackik F, Carvalho LS, Muir GJ, Zhao DY, Katz NB. Identification and quantitation of carotenoids and their metabolites in the tissues of the human eye. Exp Eye Res 2001 Mar;72(3):215-23.
16 Snodderly DM. Evidence for protection against age-related macular degeneration by carotenoids and antioxidant vitamins. Am J Clin Nutr 1995;62(suppl):1448S-61S.
17 Landrum JT, Bone RA, Kilburn MD. The macular pigment: a possible role in protection from age-related macular degeneration. Adv in Pharmacol 1997;38:537-56.
18 Pratt S. Prevention of age-related macular degeneration. J Am Optometric Assn 1999;70:39-47.
19 Bone RA, Landrum JT, Guerra LH, Ruiz CA. Lutein and zeaxanthin dietary supplements raise macular pigment density and serum concentrations of these carotenoids in humans. J Nutr 2003;133:992-8.
20 Richer S, Stiles W, Statkute L, Pulido J, Frankowski J, Rudy D, Pei K, Tsipursky M, Nyland J. Double-masked, placebo controlled, randomized trial of lutein and antioxidant supplementation in the intervention of atrophic age-related macular degeneration: the Veterans LAST study (Lutein Antioxidant Supplementation Trial). Optometry. 2004 Apr;75(4):216-30.
21 Olmedilla B, Granado F, Blanco I, Vaquero M. Lutein, but not alpha-tocopherol, supplementation improves visual function in patients with age-related cataracts: a 2-y double-blind, placebo-controlled pilot study. Nutrition. 2003 Jan;19(1):21-4.
22 Mares-Perlman JA, Fisher AI, Palta M, Block G, Millen AE, Wright JD. Lutein and zeaxanthin in the diet and serum and their relation to age-related maculopathy in the third national health and nutrition examination survey. Am J Epidemiol 2001 Mar;153(5):424-32.
23 Wang W, Connor SL, Johnson EJ, Klein ML, Hughes S, Connor WE. Effect of dietary lutein and zeaxanthin on plasma
carotenoids and their transport in lipoproteins in age-related macular degeneration. Am J Clin Nutr. 2007 Mar;85(3):762-9.
24 Rehak M, Fric E, Wiedemann P. Lutein and antioxidants in the prevention of age-related macular degeneration. Ophthalmologe. 2008 Jan;105(1):37-8, 40-5. Review. German.
25 Sahin K, Sahin N, Kucuk O. Lycopene and chemotherapy toxicity. Nutr Cancer. 2010 Oct;62(7):988-95.
26 Giovannucci EL, Ascherio A, Rimm EB, Stampfer MJ, Colditz GA, Willett WC. Intake of carotenoids and retinol in relationship to risk of prostate cancer. J Natl Cancer Inst 1995;87:1767-76.
27 Giovannucci EL. Tomato products, lycopene, and prostate cancer: a review of the epidemiological literature. J Nutr. 2005 Aug;135(8):2030S-1S.
28 Agarwal S, Rao AV. Tomato lycopene and low-density lipoprotein oxidation: a human dietary intervention study. Lipids 1998;33(981-4)
29 Rissanen T, Boutilainen S, Nyyssonen K Salonen JT. Lycopene, atherosclerosis, and coronary heart disease. Exp Biol Med (Maywood) 2002 Nov;227(10):900-7.
30 Hadley CW, Clinton SK, Schwartz SJ. The consumption on processed tomato products enhances plasma Lycopene concentrations in association with a reduced lipoprotein sensitivity to oxidative damage. J Nutr 2003 Mar;133(3):727-32.
31 Rao AV. Lycopene, tomatoes, and the prevention of coronary heart disease. Exp Biol Med (Maywood) 2002 Nov;227(10):908-13.
32 Sesso HD, Buring JE, Norkus EP, Gaziano JM. Plasma lycopene, other carotenoids, and retinol and the risk of cardiovascular disease in men. Am J Clin Nutr. 2005 May;81(5):990-7.
33 Arab L, Steck-Scott S, Fleishauer AT. Lycopene and the lung. Exp Biol Med (Maywood) 2002 Nov;227(10):894-9.
34 Zhang M, Holman CD, Binns CW. Intake of specific carotenoids and the risk of epithelial ovarian cancer. Br J Nutr. 2007 Jul;98(1):187-93. Epub 2007 Mar 19.
35 Paetau I, Khachik F, Brown ED, Beecher GR, Kramer TR, Chittams J, Clevidence BA. Chronic ingestion of lycopene-rich tomato juice or lycopene supplements significantly increases plasma concentrations of lycopene and related tomato carotenoids in humans. Am J Clin Nutr 1998;68:1187-95.
36 Astley SB, Hughes DA, Wright AJ, Elliott RM, Southon S. DNA damage and susceptibility to oxidative damage in lymphocytes: effects of carotenoids in vitro and in vivo. Br J Nutr. 2004 Jan;91(1):53-61.
37 Zhao X, Aldini G, Johnson EJ, Rasmussen H, Kraemer K, Woolf H, Musaeus N, Krinsky NI, Russell RM, Yeum KJ. Modification of lymphocyte DNA damage by carotenoid supplementation in postmenopausal women. Am J Clin Nutr. 2006 Jan;83(1):163-9.
38 Brude IR, Drevon CA, Hjermann I, Seljeflot I, Lund-Katz S, Saarem K, Sandstad B, Solvoll K, Halvorsen

B, Arnesen H, Nenseter MS. Peroxidation of LDL from combined hyperlipidemic male smokers supplied with-3 fatty acids and antioxidants. Arterioscler Thromb Vasc Biol 1997;17:2576-88
39 Alleva R, Tomasetti M, Battino M, Curatola G, Littarru GP, Folkers K. The roles of coenzyme Q10 and vitamin E on the peroxidation of human low density lipoprotein subfractions. Proc Natl Acad Sci USA 1995 Sep;92:9388-91.
40 Alleva R, Tomasetti M, Bompadre S, Littarru GP. Oxidation of LDL and their subfractions: kinetic aspects and CoQ10 content. Mol Aspects Med 1997:18 suppl:S105-12.
41 Aejmelaeus R, Metsa-Ketela T, Laippala P, Solakivi T, Alho H. Ubiquinol-10 and total peroxyle radical trapping capacity of LDL lipoproteins during aging: the effects of Q-10 supplementation. Mol Aspects Med 1997;18 suppl:S113-20.
42 Wiztum JL, Steinberg D. Role of oxidized low density lipoprotein in atherogenesis. J Clin Invest 1991;88:1785-92.
43 Shargorodsky M, Debby O, Matas Z, Zimlichman R. Effect of long-term treatment with antioxidants (vitamin C, vitamin E, coenzyme Q10 and selenium) on arterial compliance, humoral factors and inflammatory markers in patients with multiple cardiovascular risk factors. Nutr Metab (Lond). 2010 Jul 6;7:55.
44 Singh RB, Neki NS, Kartikey K, Pella D, Kumar A, Niaz MA, Thakur AS. Effect of coenzyme Q10 on risk of atherosclerosis in patients with recent myocardial infarction. Mol Cell Biochem. 2003 Apr;246(1-2):75-82.
45 Rosenfeldt F, Marasco S, Lyon W, Wowk M, Sheeran F, Bailey M, Esmore D, Davis B, Pick A, Rabinov M, Smith J, Nagley P, Pepe S. Coenzyme Q10 therapy before cardiac surgery improves mitochondrial function and in vitro contractility of myocardial tissue. J Thorac Cardiovasc Surg. 2005 Jan;129(1):25-32.
46 Suzuki YJ, Tsuchiya M, Packer L: Thioctic acid and dihydrolipoic acid are novel antioxidants which interact with reactive oxygen species. Free Radic Res Commun 1991;15:255-63.
47 Biewenga GP, Haenen GR, Bast A. The pharmacology of the antioxidant lipoic acid. Gen Pharmacol 1997;29(3)315-31.
48 Midaoui AE, Elimadi A, Wu L, Haddad PS, de Champlain J. Lipoic Acid prevents hypertension, hyperglycemia, and the increase in heart mitochondrial superoxide production. Am J Hypertens 2003;16:173-9.
49 Carbonelli MG, Di Renzo L, Bigioni M, Di Daniele N, De Lorenzo A, Fusco MA. Alpha-lipoic acid supplementation: a tool for obesity therapy? Curr Pharm Des. 2010;16(7):840-6.
50 Ghibu S, Richard C, Vergely C, Zeller M, Cottin Y, Rochette L. Antioxidant properties of an endogenous thiol: Alpha-lipoic acid, useful in the prevention of cardiovascular diseases. J Cardiovasc Pharmacol. 2009 Nov;54(5):391-8. Review.
51 Wong IY, Koo SC, Chan CW. Prevention of age-related macular degeneration. Int Ophthalmol. 2010 Sep 23. [Epub ahead of print]
52 Zafra-Stone S, Yasmin T, Bagchi M, Chatterjee A, Vinson JA, Bagchi D. Berry anthocyanins as novel antioxidants in human health and disease prevention. Mol Nutr Food Res. 2007 Jun;51(6):675-83. Review.
53 Bagchi D, Roy S, Patel V, He G, Khanna S, Ojha N, Phillips C, Ghosh S, Bagchi M, Sen CK. Safety and whole-body antioxidant potential of a novel anthocyanin-rich formulation of edible berries. Mol Cell Biochem. 2006 Jan;281(1-2):197-209.
54 Bagchi D, Sen CK, Bagchi M, Atalay M. Anti-angiogenic, antioxidant, and anti-carcinogenic properties of a novel anthocyanin-rich berry extract formula. Biochemistry (Mosc). 2004 Jan;69(1):75-80, 1 p preceding 75. Review.
55 Department of Agriculture (US). Continuing survey of food intakes by individuals (CSFII): diet and health knowledge survey. 1996 (Magnetic tape).
56 Hathock JN. Vitamins and minerals: efficacy and safety. Am J Clin Nutr 1997 Aug; 66(2):427-37.
57 Hathock JN. Vitamins and mineral Safety. 2nd Edition. Council for Responsible Nutrition. 2004.
58 Department of Agriculture (US). What We Eat in America, NHANES 2001-2002: Usual Nutrient Intakes from Food Compared to Dietary Reference Intakes. September 2005.
59 Shao A, Hathcock JN. Risk assessment for the carotenoids lutein and lycopene. Regul Toxicol Pharmacol. 2006 Aug;45(3):289-98. Epub 2006 Jun 30. Review.
60 Lund EL, Quistorff B, Spang-Thomsen M, Kristjansen PE. Effect of radiation therapy on small-cell lung cancer is reduced by ubiquinone intake. Folia Microbiol (Praha). 1998;43(5):505-6.
61 Henriksen JE, Andersen CB, Hother-Nielsen O, Vaag A, Mortensen SA, Beck-Nielsen H. Impact of ubiquinone (coenzyme Q10) treatment on glycaemic control, insulin requirement and well-being in patients with Type 1 diabetes mellitus. Diabet Med. 1999 Apr;16(4):312-8.

62 Eriksson JG, Forsén TJ, Mortensen SA, Rohde M. The effect of coenzyme Q10 administration on metabolic control in patients with type 2 diabetes mellitus. Biofactors. 1999;9(2-4):315-8.
63 Reljanovic M, Reichel G, Rett K, et al. Treatment of diabetic polyneuropathy with the antioxidant thioctic acid (alpha-lipoic acid): A 2-year, multicenter, randomized, double-blind, placebo-controlled trial (ALADIN II). Alpha Lipoic Acid in Diabetic Neuropathy [abstract]. Free Radic Res 1999;31:171-7.
64 Ziegler D, Hanefeld M, Ruhnau K, et al. Treatment of symptomatic diabetic polyneuropathy with the antioxidant alpha-lipoic acid: A 7-month, multicenter, randomized, controlled trial (ALADIN III Study). Diabetes Care 1999;22:1296-301.
65 Ametov AS, Barinov A, Dyck PJ, et al. The sensory symptoms of diabetic polyneuropathy are improved with alpha-lipoic acid. Diabetes Care 2003;26:770-6.
66 Vincent HK, Bourguignon CM, Vincent KR, Taylor AG. Effects of alpha-lipoic acid supplementation in peripheral arterial disease: a pilot study. J Alt Complement Med 2007;13:577-84.
67 Ziegler D, Ametov A, Barinov A, Dyck PJ, Gurieva I, Low PA, Munzel U, Yakhno N, Raz I, Novosadova M, Maus J, Samigullin R. Oral treatment with alpha-lipoic acid improves symptomatic diabetic polyneuropathy: the SYDNEY 2 trial. Diabetes Care. 2006 Nov;29(11):2365-70.
68 Cremer DR, Rabeler R, Roberts A, Lynch B. Long-term safety of alpha-lipoic acid (ALA) consumption: A 2-year study. Regul Toxicol Pharmacol. 2006 Dec;46(3):193-201.
69 Hathcock JN, Shao A. Risk assessment for coenzyme Q10 (Ubiqu inone). Regul Toxicol Pharmacol. 2006 Aug;45(3):282-8. Epub 2006 Jun 30. Review.

Joint Flex Plus™ (Biocell Collagen II)

Goal

Osteoarthritis (OA) is a condition of degeneration of the protective covering at bone articular surfaces (cartilage). Age and injury are associated with an increased risk of development, with other lifestyle factors intervening (such as obesity). Because cartilage is used as a cushion between bone joints, its loss causes friction, pain and stiffness.

BioCell Collagen II is a patented dietary supplement containing low molecular weight undenatured type II collagen combined with hyaluronic acid (HA) and chondroitin sulfate (CS).

Type II collagen and collagen fragments (as found in Joint Flex Plus formula) may act as signals to increase cartilage synthesis as well as provide lubrication to improve/maintain healthy joint tissue and function.

Rationale

Type II Collagen

The role of articular cartilage is to bear load, absorb shock and minimize wear between articulating joint surfaces. Chondrocytes, the cells of articular cartilage, do not directly contribute to these physical properties; only the extracellular matrix (ECM) plays a direct structural role. However, as the only cell type normally resident within articular cartilage, chondrocytes are responsible for the synthesis and maintenance of a viable extracellular matrix which is suitably adapted to cope with the physical pressures of its environment.

The health of articular cartilage, then, is dependent upon the maintenance of the ECM. The ECM is a macromolecular framework made of two main components, proteoglycans and collagens. Type II collagen is the predominant type in cartilage. Type II collagen forms a 3D fibrous network which provides tensile stiffness and strength to cartilage and provides the basic architecture to the tissue. Aggrecans (and other types of proteoglycans) are embedded within this fibrous network, providing compressibility and elasticity to the tissue.

Chondrocytes are responsible for the synthesis, organization and maintenance of the ECM. Communication between chondrocytes and the ECM determine degradation or synthesis. OA can alter the sensitivity of chondrocytes to regulatory signals. This leads to a progressive imbalance between degradation and synthesis/regeneration, leading to a marked decrease in the content of type II collagen in the ECM, eventually leading to cartilage damage. Type II collagen and collagen fragments are proposed to regulate metabolic activities in chondrocytes.

The theory behind supplementation is the role that collagen fragments have in regulating chondrocyte activity. The presence of collagen fragments (hydrolyzed) gives the appearance that ECM degradation has occurred. This stimulates the chondrocytes to increase ECM synthesis, in an attempt to "repair" the damaged structure. Several studies featuring in vitro and in vivo design have shown significant improvement in the ECM as well as standard tests to assess pain, physical activity and quality of life in both animal and human models.

Animal studies in rats showed reduced articular cartilage degradation in an OA model with oral supplementation of chicken collagen type II.[1] Obese-arthritic dogs given 4mg or 40mg doses of UC II (undenatured type II collagen from chicken sternum) for 90 days showed significant reductions in overall pain, pain during limb manipulation and lameness after physical activity. There was a dose dependant response. Additionally, after a 30-day withdrawal, all animals experienced a relapse and increases in pain measures.[2]

In 2002, researchers in Germany explored the effect of type II collagen biosynthesis by bovine chondrocytes when cultured with different types and MW of collagen (type I and II hydrolyzed, type I and

II native and collagen free wheat protein). Their results indicated a stimulatory effect on type II collagen biosynthesis and secretion by chondrocytes when cultured with hydrolyzed collagen, in a dose dependant manner. The researchers found that only hydrolyzed collagen, and primarily of lower MW (<10 kDa) was able to exert this influence. This illuminated a possible feedback mechanism for the regulation of collagen turnover in cartilage.[3] A study in 2003 also showed that type II collagen increased the ECM content, as well as subtle differences in biochemical markers.[4]

In 2000, Moskowitz reviewed the results of studies using collagen hydrolysates in the US, United Kingdom and Germany. A significant impact on pain measures was noted; see Figure 1 and Figure 2. As with the GAIT study, the benefits seem to be greatest in those who suffer OA to a greater degree.[5]

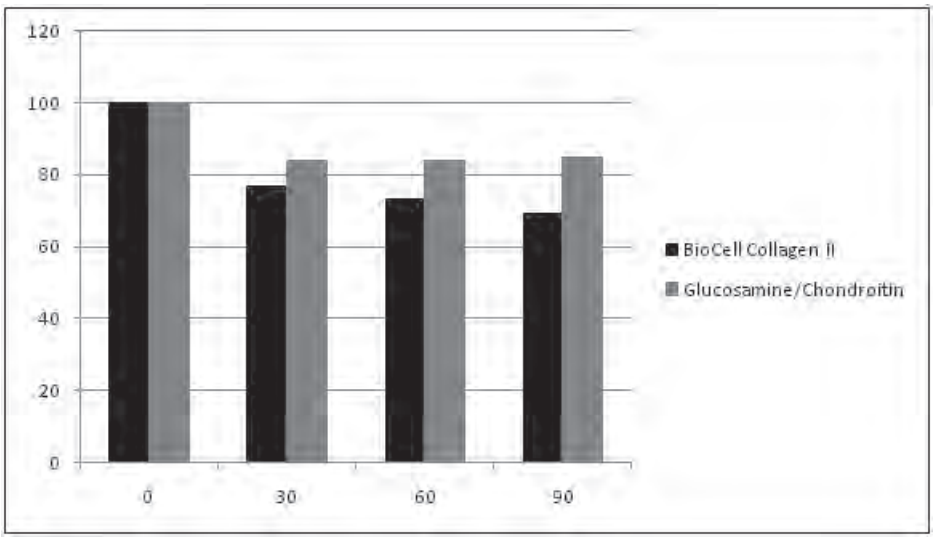

Figure 1: WOMAC scores were reduced by 33% in the UC-II group vs. 14% with GS (UC-II = BioCell Collagen II). The WOMAC* (Western Ontario and McMaster Universities) Index of Osteoarthritis

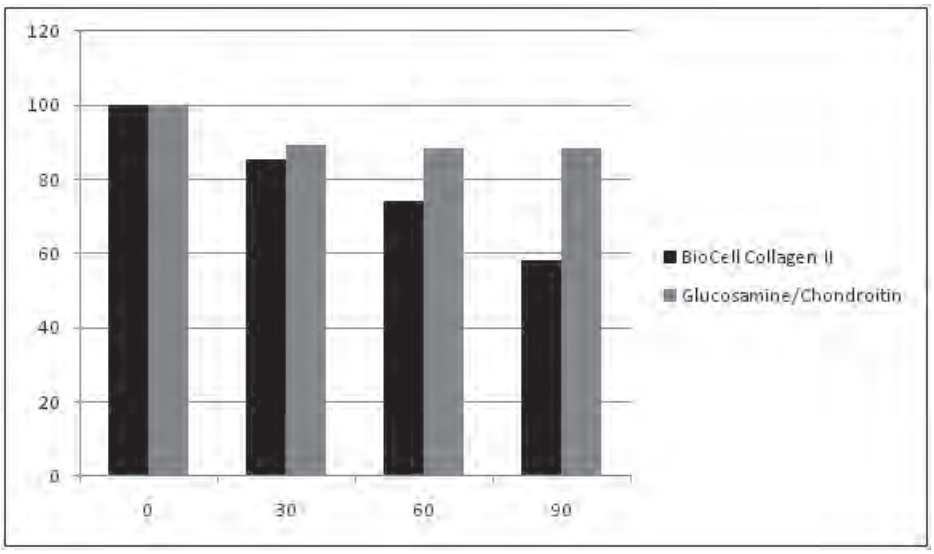

Figure 2: VAS scores were decreased by 40% for UC-II vs. 15% for GS (UC-II = BioCell Collagen II). The VAS** (Visual Analogue Scale) Index of Osteoarthritis.

*The WOMAC index is used to assess patients with osteoarthritis of the hip or knee using 24

parameters. It can be used to monitor the course of the disease or to determine the effectiveness of anti-rheumatic medications. In this study the WOMAC score measured the difficulty in physical function, stiffness and pain in the knee.

A 2004 abstract looked at the efficacy of BioCell collagen specifically. In this RDBPCT, 16 subjects with OA of the knee or hand used BioCell 1000mg BID for two months. Adverse events were the same as placebo and were insignificant and not related to the study substances. The BioCell group experienced significant improvement in all WOMAC subscales and in total WOMAC score compared to placebo.[6]

In 2009, a clinical trial was presented that looked not only at the effectiveness of undenatured type II collagen (UC-II) on OA pain, but also compared it to glucosamine and chondroitin (GC) use. A daily dose of 40mg of UC-II was used, providing 10mg of bioactive undenatured type II collagen. WOMAC scores were reduced by 33% in the UC-II vs 14% with GC. VAS scores were decreased by 40% for UC-II vs 15% for GC. The Lequesne Score (used to determine the effect on pain during daily activities) was reduced by 20.1% for UC-II vs 5.9% for GC. Overall, the UC-II group experienced significant reductions in all measures of pain and pain during activities and did so to a significantly greater degree than GC supplementation.[7]

Additionally, there are several studies that have looked at the effects of UC-II on rheumatoid arthritis (RA), an autoimmune disorder. Results are promising and may be to an auto-antigen action, suppressing T-cell activity and autoimmune responses.[8]

Ultimately, it appears that oral administration of UC-II is effective and appears to follow a dose response to symptoms of OA. The proposed mechanism of action is through increases undenatured type II collagen in the ECM signaling type II collagen synthesis by chondrocytes, leading to a more advantageous ECM environment--one that favors a better ratio of synthesis vs degradation.

** A Visual Analogue Scale (VAS) is a measurement instrument that tries to measure a characteristic or attitude that is believed to range across a continuum of values and cannot easily be directly measured. An example of a VAS would be a numeric scale of 1 to 10 to represent severity of pain (1 being little to no pain and 10 representing excruciating pain).

Hyaluronic Acid

Hyaluronic acid (HA) is an anionic, non-sulfated glycosaminoglycan distributed widely throughout connective tissues and is one of the chief components of the extracellular matrix. It is a major component of the synovial fluid and contributes to the viscosity of the fluid. Along with lubricin, it is one of the fluid's main lubricating components.

HA is an important component of articular cartilage, where it is present as a coat around chondrocytes. When aggrecan monomers bind to hyaluronan in the presence of link protein, large highly negatively charged aggregates form. These aggregates wick water and are responsible for the resilience of cartilage (its resistance to compression). In OA or joint degradation, HA levels are decreased.

The proposed mechanism of action would be to support a healthy ECM and provide the raw materials for joint health as well as bringing water to cartilage and aid in synovial fluid viscosity and protection/ reaction to pressure and shock.[9] Intra-articular injections with HA are quite common and have repeatedly shown improvement in symptoms of OA and joint degeneration. Effective absorption and uptake by oral supplementation of high MW hyaluronic acid has been shown in rats and dogs.[10]

Chondroitin Sulfate

It is a necessary substrate for cartilage metabolism and assists in maintaining joint viscosity. In vitro studies show that chondroitin also inhibits enzymes that degrade cartilage. In recent reviews of chondroitin, the researchers concluded: the safety and tolerability of CS are confirmed, CS is effective, at least in part, for the treatment of OA and its therapeutic benefits occur through three main mechanisms: 1) stimulation

of ECM production by chondrocytes; 2) suppression of inflammatory mediators; and 3) inhibition of cartilage degeneration. Its effects include benefits that are not achieved by current medicines and include chondroprotection and the prevention of joint space narrowing.[11,12]

Latest 80 Patient Human Clinical Trial Confirms Earlier Results Demonstrating the Safety and Efficacy of BioCell Collagen II in Supporting OA-Associated Joint Conditions

On September 13, 2010, Newport Beach, CA, BioCell Technology, LLC, announced the completion of the largest human study to date of BioCell Collagen II in subjects suffering from joint conditions associated with OA (osteoarthritis). This multi-center, double-blind, placebo-controlled trial has demonstrated the safety and efficacy of BioCell Collagen II in addressing the disease symptoms and in improving various physical activities, as measured by VAS and WOMAC scores.

As mentioned above, the previous 16 patient study of BioCell Collagen II had demonstrated a similar safety profile and statistically significant efficacy in supporting chronic degenerative joint conditions in patients with OA. The recently completed study enrolled 80 patients to strengthen the statistical force behind the earlier finding. In addition, the current study investigated the effect of BioCell Collagen II for a longer term than the previous one. This has made possible various statistical analyses, one of whose key findings was that a significant portion of OA patients experienced highly substantial improvement of their joint conditions. The details of this study are expected to be published in the near future.

Additionally in 2010, BioCell Technology, LLC, received Generally Recognized As Safe (GRAS) approval by an independent expert panel for its patented, clinically-substantiated ingredient, BioCell Collagen II®.

Summary

Purpose

Joint Flex Plus is a safe alternative to the more dangerous NSAIDS for the treatment of mild to moderate osteoarthritis and should be a strong consideration to those that suffer from OA. JFP would be targeted to those older adults who experience mild to severe joint pain due to the loss of cartilage that leads to OA.

- Joint Flex Plus is one component of the dotFIT longevity program which is made available to all program users and appears on the dotFIT website.
- Studies show that the ingredients in the new JFP may provide greater relief than glucosamine and chondroitin combined.
- The ingredients in Joint Flex Plus have been shown to support cartilage, joint and skin health.
- They have been clinically proven to be more than twice as effective as GS & CS in patients with moderate to severe osteoarthritis.
- Reduces symptoms of joint pain and increases functional capacity without the side effects of NSAIDS.

Unique Features

- Contains the patented formula BioCell Collagen II
- Contains no other added ingredients so you may take other products (multivitamin, antioxidant) without worrying about reaching excessive nutrient levels that may be detrimental over time
- Dosages and compounds are in the amounts used in research that have shown to improve mobility, joint comfort, and knee-joint strength
- Formula considers use of other dotFIT products to help the user maintain a safe and optimal range of total nutrient intake
- Manufactured in an FDA-registered facility, in compliance with Good Manufacturing Practices (GMP's)

Typical Use

- Individuals concerned with joint and cartilage health
- For overuse or age-related joint discomfort
- Take 1 capsule in the morning and 1 capsule at night before a meal with least 8 oz. of water.
- For optimal results, take 2 capsules in the morning and 2 capsules at night before a meal or as directed by your health care professional.

Precautions

The ingredients in the Joint Flex Plus are generally considered to be safe at the recommended dose.

Contraindications

The use of JFP is not recommended during pregnancy or lactation due to the absence of use data for these populations. No known contraindications exist at this time.

Adverse Reactions

Study participants who used BioCell 1000mg BID for two months experienced adverse events the same as placebo and were insignificant and not related to the study substances. No adverse events were reported in the literature for the other substances.

Upper Limit/Toxicity

There are no known overdoses of the BioCell ingredients either individually or as the formula.

Supplement Facts

Serving Size: 2 Capsules — Servings Per Container: 30

Amount Per Serving	% Daily Value*
BioCell Collagen II®	1,000 mg *
Hydrolyzed Collagen Type II	600 mg **
Chondroitin Sulfate	200 mg **
Hyaluronic Acid (HA)	100 mg **

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

** % Daily Value not established.

Other Ingredients: Kosher Gelatin (capsule), Rice powder, and Magnesium stearate.

Contains No: Shellfish (crustacean), Fish, Dairy, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial colors, Flavoring, Sulphites, MSG (monosodium glutamate) or Preservatives added. Free of Titanium dioxide.

References

1 Xu D, Shen W. Chicken collagen type II reduces articular cartilage destruction in a model of osteoarthritis in rats. West Indian Med J. 2007 Jun; 56(3): 202-7.
2 D'Altilio M, et al. Therapeutic efficacy and safety of undenatured type II collagen singly or in combination with glucosamine and chondroitin in arthritic dogs. Tox Mech Methods. 2007; 17:189-196.
3 Oesser S, Seifert J. Stimulation of type II collagen biosynthesis and secretion in bovine chondrocytes cultured with degraded collagen. Cell Tissue Res (2003) 311: 393-399.
4 Qi WN, Scully SP. Type II collagen modulates the composition of extracellular matrix synthesized by articular chondrocytes. J Orthop Res (2003) Mar; 21(2): 282-9.
5 Moskowitz RW. Role of collagen hydrolysates in bone and joint disease. Semin Arthritis Rheum (2000) 30: 87-99.
6 Kalman DS, Schwartz HI, Pachon J, Sheldon E, Almada AL. A randomized double bline clinical trial evaluating the safety and efficacy of hydrolyzed collagen type II in adults with osteoarthritis. Experimental Biology 2004 meeting abstract.
7 Crowly CC, et al. safety and efficacy of undenatured type II collagen in the treatment of osteoarthritis of the knee: a clinical trial. Int J Med Sci 2009; 6(6):312-321.
8 Bagchi D, Misner B, Bachi M, Kothari SC, Downs BW, Fafard RD, Preuss HG. Effects of orally administered undenatured type II collagen against arthritic inflammatory diseases: a mechanistic exploration. Int J clin Pharmacol Res. 2002; 22(3-4): 101-10.
9 Akmal M, Singh A, anand A, Kesani A, Aslam N, Goodship A, Bentley G. The effects of hyaluronic acid on articular chondrocytes. J Bone Joint Surg Br. 2005 Aug; 87(8): 1143-9.
10 Balogh L, et al. Absorption, uptake and tissue affinity of high-molecular-weight hyaluronan after oral administration in rats and dogs. J Agric Food Chem. 2008 Nov26; 56(22): 10582-93.
11 Uebelhart D. Clinical review of chondroitin sulfate in osteoarthritis. Osteoarthritis Cartilage. 2008; 16 Suppl 3:s19-21.
12 Kubo M, Ando K, Mimura T, Matsusue Y, Mori K. Chondroitin sulfate for the treatment of hip and knee osteoarthritis: current status and future trends. Life Sci. 2009 Sep 23; 85(13-14): 477-83.

SuperOmega-3

Goal

Fish oils are fats found in fish (e.g. mackerel, lake trout, herring, sardines, albacore tuna and salmon), which are a rich source of long-chain polyunsaturated fatty acids (LCPUFA), better known as omega-3 (n- 3 or w-3) fatty acids (FA). The two most studied n-3 fatty acids are the 20-carbon eicosapentaenoic acid (EPA) and the 22-carbon docosahexaenoic acid (DHA).

Due to current dietary habits, the median intake of n-3 fatty acids EPA and DHA for Americans is approximately 128 mg/day, well below any level of benefit.[1,2] National Health and Nutrition Examination Survey (NHANES) data from 1999-2000 reveals that fish intake is approximately three ounces per week and, moreover, from seafood not high in n-3 fatty acids.[3] The goal of this product is to provide a source of these important fatty acids in a mercury-free, easy-to-ingest form. The formula will also supply the appropriate amounts that have demonstrated myriad health benefits related to heart and brain function for those who do not or cannot consume diets containing these heart healthy nutrients e.g. specific oily fishes and certain plant foods.

Rationale

Heart Disease (high blood pressure, hyperlipidemia and cardiac arrhythmias)

These fatty acids have been shown in numerous studies to lower elevated triglyceride levels.[4,5,6,7,8] The triglyceride-lowering effect of EPA and DHA appears to result from the combined effects of inhibition of lipogenesis,[9,10] faster clearance of chylomicrons[11] and stimulation of fatty acid oxidation in liver.[12,13]

Eicosanoids are bioactive molecules that have various roles in inflammation, regulation of blood pressure,[14] blood clotting, and immune system modulation. They are derived mostly from the w-6 fatty acids, arachidonic acid.

A diet high in n-6 fatty acids leads to an increase in prothrombotic and proinflammatory prostaglandins thus increasing the risk of hyperlipidemia, cardiovascular disease and Type II diabetes.[15,16,17,18,19,20]

Ingestion of DHA and EPA partially replace the n-6 fatty in the cell membranes (i.e. red blood cells, liver cells and specific leukocytes), thus reducing prostaglandin E2, thromboxane A2 (potent platelet aggregator and vasoconstrictor), and formation of leukotriene B4, an inducer of inflammation and a powerful inducer of leukocyte chemotaxis and adherence. Concurrently there is an increased concentration of prostacyclin PGI3 without decreasing PGI2. Both PGI2 and PGI3 are active vasodilators and inhibitors of platelet aggregation.[15,16,17] This may explain EPA and DHA's positive effects on hyperlipidemia, coronary artery disease progression and blood pressure.[14,21]

Although scientific studies have produced mixed results regarding higher intakes of n-3 FA and reductions in non-fatal myocardial infarction, the anti-arrhythmic effect is well-established.[22,23,24,25,26,27]

Based on animal models and in vitro studies, EPA and DHA exert their effects on heart cells by inhibiting fast, voltage-dependent sodium and calcium currents. This is especially promising in possibly reducing arrhythmias and fibrillation (e.g. sudden cardiac death) in those who have suffered a myocardial infarction (such as a heart attack).[24,26]

A recent published review concluded that there is extensive evidence from three decades of research that fish oils, or more specifically the omega-3 polyunsaturated fatty acids (PUFAs) contained in them, are beneficial for everyone.[28] This includes healthy people as a supplement for disease prevention as well as those with heart disease — including postmyocardial infarction (MI) patients and those with heart failure, atherosclerosis, or atrial fibrillation.

Inflammation

As stated earlier, inflammatory and immune cells are sensitive to change according to the ratio of n-3 and n-6 fatty acids in one's diet.[18] Several other anti-inflammatory effects of DHA and EPA might be explained by competitively inhibiting cyclooxygenase-2 (COX-2), lipoxygenase-5 (LOX-5), interleukin (IL)-

1a and tumor necrosis factor-alpha (TNF-a), enzymes involved in inflammation and cartilage degradation.[29,30,31] Therefore, the n-3 fatty acids, EPA and DHA, may possess anti-inflammatory activity, reducing rheumatoid arthritis[18] and other arthritic conditions. Unlike non-steroidal anti-inflammatory drugs (NSAIDs) which can reduce inflammation on-demand, fish oil supplementation is not associated with gastrointestinal distress and does not increase cardiovascular risk.[30]

Age-related Macular Degeneration (AMD)

AMD is the leading cause of blindness.[32] DHA is a key essential fatty acid found in the retina[33,34,35] and is involved in visual development.[36] Photoreceptor outer segments in the eyes are constantly being renewed which may require a steady supply of DHA to maintain proper functioning.[35] Blockage of the blood vessels that supply the retina contributes to AMD. The beneficial effects of n-3 fatty acids on the retina may be due to DHA and EPA's antithrombotic and hypolipidemic effects.[35,37] Epidemiological studies have suggested that the n-3 fatty acids, DHA and EPA, may be protective against AMD.[35,37,38]

In fact, a recent 12-year study demonstrated that participants who reported the highest omega-3 FA intake were 30% less likely than their peers to develop central geographic atrophy (CGA) and neovascular (NV) AMD.[39]

Cognitive Function

Because DHA is integral to the maintenance of the cell membranes in the brain and important to the overall central nervous system function, regular consumption of n-3 FA is believed to dramatically reduce the risk of dementia,[40] thus preserving cognitive function in the aging population and contributing to mood improvement.[41,42,43,44,45] Recent studies also have concluded that fish oil consumption can also boost memory for healthy adults,[46] once again demonstrating that in order for health or disease prevention benefits from omega-3 FAs to be maximized, regular intake should begin early in life.

Development and behavior of children

Deficiencies and imbalances of omega-3 FAs, not only during the developmental phase but throughout the whole life span, have significant effects on brain function. Numerous observational studies have shown a link between childhood developmental disorders and fatty acid imbalances. For instance, neurocognitive disorders such as attention-deficit hyperactivity disorder (ADHD), dyslexia, dyspraxia and autism spectrum disorders are often associated with a relative lack of omega-3 fatty acids.[47,48] Additionally, DHA supplementation of infant formula has been shown to improve visual acuity in newborns.[49]

Body Composition

The results of a recent double blind study showed that 6 weeks of supplemental fish oil significantly increased lean mass, and significantly reduced fat mass in healthy adults.[50] This is in agreement with Couet et al.,[51] observing a significant 0.88 kg reduction in fat mass, and a non significant 0.20 kg increase in lean mass following 3 weeks of an increased consumption of fish oil. In their study, they added fish oil to the diet, but kept total fat and energy constant between the treatments. In this most recent study, the fish oil was added on top of an ad libitum diet, with directions given to the subjects to maintain their normal dietary patterns throughout the study.

Similarly, Hill et al.[52] found a significant reduction in fat mass following 12 weeks of supplementation with fish oil in overweight subjects. They also observed a non-significant increase in lean mass. Thorsdottir et al.[53] recently found that supplementation with fish oil, or inclusion of fish in an energy-restricted diet resulted in significantly greater weight loss in young men. They also found that young men taking the fish oil supplements had a significantly greater reduction in waist circumference compared to the control group, or the group that increased their dietary intake of fish.

When diet lacks the DHA and EPA content that has demonstrated the above protective qualities, an n-3 FA supplement would be prudent in order to help preserve overall health.

Typical Use

To maintain cardiac and brain health, take one or two softgels with any meal.

Precautions

Fish oil supplements should be used by children, pregnant women and nursing mothers only if recommended and monitored by a physician. Because of the possible anti-thrombotic effect of fish oil supplements, hemophiliacs and those taking warfarin (Coumadin) should exercise caution in their use.[54,55] Fish oil supplements should be stopped before any surgical procedure. Conflicting results have been reported regarding the effects of fish oil supplements on glycemic control in those with glucose intolerance including Type II diabetics.[21,56] Some early studies indicated that fish oil supplements might have detrimental effects in those groups. Recently, better designed studies have not reported these adverse effects; in fact studies are now suggesting benefits for diabetics.[57] There is no evidence that fish oil supplements have detrimental effects on glucose tolerance, insulin secretion or insulin resistance in non-diabetic subjects. Diabetics should discuss the use of these supplements with their physicians and note if the supplements affect their glycemic control. Diabetics who take fish oil supplements should be monitored by their physicians.

Contraindications

- Anyone taking greater than three grams per day should do so only under the care of their physician due to risk of excessive bleeding at higher doses[21]
- Should not be used if user is on anticoagulants or has uncontrolled hypertension[54,55]
- May raise blood sugar and LDL in people with diabetes[21]

Adverse Reactions

Fish oil supplementation is usually well-tolerated at three to four grams per day. Those side effects that have been reported include mild gastrointestinal upsets such as nausea and diarrhea, halitosis, eructation (belching) and "fishy" smelling breath, skin and even urine.[21] Taking greater than three grams per day of n-3 fatty acids can cause excessive bleeding.[21]

Upper Limit/Toxicity

The US Food and Drug Administration has set the "Generally Regarded as Safe (GRAS)" level for n-3 fatty acids at three grams per day.[58]

Summary

Purpose

Omega-3 FAs are uncommon in the American diet yet are shown to have greater potential than most other nutrients in maintaining good health. Additionally, it is well known that there is an increasing shortage of the fish that are the best sources of these omega-3 FA, making supplements an important consideration.

- Cardiovascular (CV) disease is the number one killer in the US and regular consumption of omega-3 FAs has the ability to reduce negative CV incidences
- Omega-3 FA supplementation would be targeted to all adults (over 18) who do not receive one to two grams per day of the omega-3 FAs EPA & DHA (equivalent to two to four servings of fatty fish/ weekly) as a potential natural preventative aid in age-related cognitive decline and prevention of CV disease
- Recommended as part of the dotFIT longevity program
- It has been demonstrated that supplemental fish oil can deliver the same benefits as the oil in fish[59,60,61]

Unique Features

- dotFIT's SuperOmega-3 fish oil complex provides maximum potencies of two key essential fatty acids, EPA and DHA
- Each softgel delivers 60% EPA and 40% DHA—double the potency of typical fish oil products
- To maximize the body's absorption of omega-3 essential fatty acids, each softgel is uniquely enteric-coated to withstand stomach acid and dissolve in the small intestine. The result is maximum absorption and no "fishy repeat" or "fish burps"

- dotFIT's SuperOmega-3 fish oil complex is mercury-free and contains no PCBs
- This formula considers use of other dotFIT products to help the user maintain a safe and optimal range of total nutrient intake
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Supplement Facts

Serving Size: 1 Softgel
Servings Per Container: 30
Calories 13
Fat Cal. 12

Amount Per Serving		% Daily Value*
Total Fat	**1.3 g**	**2%**
Saturated Fat	0.1 g	<1%
Trans Fat	0 g	**
Polyunsaturated Fat	1.1 g	**
Monounsaturated Fat	0.2 g	**
Cholesterol	**1 mg**	**<1%**
Vitamin E (D-Alpha Tocopheryl)	2 IU	7%
Total Omega-3 Polyunsaturates	600 mg	**
EPA (Eicosapentaenoic acid)	360 mg	**
DHA (Docosahexaenoic acid)	240 mg	**

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Gelatin, Glycerin, Water (Purified), Methacrylic acid, Copolymer, Triacetin FCC.

Contains No: Dairy, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten.
No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.
Components in this product are derived from natural sources.

Purity tested for pesticides, herbicides, PCBs and dioxins as well as heavy metals such as mercury.

This fish oil was processed using molecular distillation to ensure purity.

References

1 Gebauer SK, Psota TL, Harris WS, Kris-Etherton PM. n-3 fatty acid dietary recommendations and food sources to achieve essentiality and cardiovascular benefits. Am J Clin Nutr. 2006 Jun;83(6 Suppl):1526S-1535S. Review.
2 Arterburn LM, Hall EB, Oken H. Distribution, interconversion, and dose response of n-3 fatty acids in humans. Am J Clin Nutr. 2006 Jun;83(6 Suppl):1467S-1476S. Review.
3 Institute of Medicine. Seafood Choices: Balancing Benefits and Risks. Washington, DC: National Academies Press; 2006.
4 McKenney JM, Sica D. Prescription omega-3 fatty acids for the treatment of hypertriglyceridemia. Am J Health Syst Pharm. 2007 Mar 15;64(6):595-605.
5 Schwellenbach LJ, Olson KL, McConnell KJ, Stolcpart RS, Nash JD, Merenich JA; Clinical Pharmacy Cardiac Risk Service Study Group. The triglyceride-lowering effects of a modest dose of docosahexaenoic acid alone versus in combination with low dose eicosapentaenoic acid in patients with coronary artery disease and elevated triglycerides. J Am Coll Nutr. 2006 Dec;25(6):480-5.
6 Baldassarre D, Amato M, Eligini S, Barbieri SS, Mussoni L, Frigerio B, Kozakova M, Tremoli E, Sirtori CR, Colli S. Effect of n-3 fatty acids on carotid atherosclerosis and haemostasis in patients with combined hyperlipoproteinemia: a double-blind pilot study in primary prevention. Ann Med. 2006;38(5):367-75.
7 Nambi V, Ballantyne CM. Combination therapy with statins and omega-3 fatty acids. Am J Cardiol. 2006 Aug 21;98(4A):34i-38i. Epub 2006 May 30. Review.
8 Davidson MH. Mechanisms for the hypotriglyceridemic effect of marine omega-3 fatty acids. Am J Cardiol. 2006 Aug 21;98(4A):27i-33i. Epub 2006 May 26. Review.
9 Harris WS, Bulchandani D. Why do omega-3 fatty acids lower serum triglycerides? Curr Opin Lipidol. 2006 Aug;17(4):387-93.
10 Davidson MH. Mechanisms for the hypotriglyceridemic effect of marine omega-3 fatty acids. Am J Cardiol. 2006 Aug 21;98(4A):27i-33i. Epub 2006 May 26. Review.
11 Park Y, Harris WS. Omega-3 fatty acid supplementation accelerates chylomicron triglyceride clearance. J Lipid Res. 2003 Mar;44(3):455-63. Epub 2002 Dec 1.
12 Vanschoonbeek K, de Maat MP, Heemskerk JW. Fish oil consumption and reduction of arterial disease. J Nutr. 2003 Mar;133(3):657-60. Review.

13 Park Y, Jones PG, Harris WS. Triacylglycerol-rich lipoprotein margination: a potential surrogate for whole-body lipoprotein lipase activity and effects of eicosapentaenoic and docosahexaenoic acids. Am J Clin Nutr. 2004 Jul;80(1):45-50.
14 Ramel A, Martinez JA, Kiely M, Bandarra NM, Thorsdottir I. Moderate consumption of fatty fish reduces diastolic blood pressure in overweight and obese European young adults during energy restriction. Nutrition. 2010 Feb;26(2):168-74. Epub 2009 May 31.
15 Weber PC, Fischer S, von Schacky C, et al.: Dietary omega- 3 polyunsaturated fatty acids and eicosanoid formation in man. In Health Effects of Polyunsaturated Fatty Acids in Seafoods. Edited by Simopoulos AP, Kifer RR, Martin RE. Orlando: Academic Press; 1986:49–60.
16 Lewis RA, Lee TH, Austen KF: Effects of omega-3 fatty acids on the generation of products of the 5-lipoxygenase pathway. In Health Effects of Polyunsaturated Fatty Acids in Seafoods. Edited by Simopoulos AP, Kifer RR, Martin RE. Orlando: Academic Press; 1986:227–238.
17 Calder PC. Polyunsaturated fatty acids, inflammation, and immunity. Lipids. 2001 Sep;36(9):1007-24. Review.
18 Cleland LG, Caughey GE, James MJ, Proudman SM. Reduction of cardiovascular risk factors with long term fish oil treatment in early rheumatoid arthritis. J Rheumatol. 2006 Oct;33(10):1973-9. Epub 2006 Aug 1.
19 James MJ, Gibson RA, Cleland LG. Dietary polyunsaturated fatty acids and inflammatory mediator production. Am J Clin Nutr. 2000 Jan;71(1 Suppl):343S-8S. Review.
20 Simopoulos AP. Omega-3 fatty acids and athletics. Curr Sports Med Rep. 2007 Jul;6(4):230-6. Review.
21 Kris-Ehterton PM, Harris WS, Appel LJ, et al. Fish consumption, fish oil, omega-3 fatty acids, and cardiovascular disease.
Circulation 2002;106:2747-57. 22 Kottke TE, Wu LA, Brekke LN, Brekke MJ, White RD. Preventing sudden death with n-3 (omega-3) fatty acids and defibrillators. Am J Prev Med. 2006 Oct;31(4):316-323.
23 Leaf A, Kang JX, Xiao YF, Billman GE. Clinical prevention of sudden cardiac death by n-3 polyunsaturated fatty acids and mechanism of prevention of arrhythmias by n-3 fish oils. Circulation. 2003 Jun 3;107(21):2646-52. Review.
24 Leaf A, Xiao YF, Kang JX, Billman GE. Membrane effects of the n-3 fish oil fatty acids, which prevent fatal ventricular arrhythmias. J Membr Biol. 2005 Jul;206(2):129-39. Review.
25 Albert CM, Campos H, Stampfer MJ, Ridker PM, Manson JE, Willett WC, Ma J. Blood levels of long-chain n-3 fatty acids and the risk of sudden death. N Engl J Med. 2002 Apr 11;346(15):1113-8.
26 Leaf A. Prevention of sudden cardiac death by n-3 polyunsaturated fatty acids. Fundam Clin Pharmacol. 2006 Dec;20(6):525-38. Review.
27 Sun Q, Ma J, Campos H, Rexrode KM, Albert CM, Mozaffarian D, Hu FB. Blood concentrations of individual long-chain n-3 fatty acids and risk of nonfatal myocardial infarction. Am J Clin Nutr. 2008 Jul;88(1):216-23.
28 Lavie CJ, Milani RV, Mehra MR, Ventura HO. Omega-3 polyunsaturated fatty acids and cardiovascular diseases. J Am Coll Cardiol. 2009 Aug 11;54(7):585-94. Review.
29 Mantzioris E, Cleland LG, Gibson RA, Neumann MA, Demasi M, James MJ. Biochemical effects of a diet containing foods enriched with n-3 fatty acids. Am J Clin Nutr. 2000 Jul;72(1):42-8.
30 Cleland LG, James MJ. Marine oils for antiinflammatory effect -- time to take stock. J Rheumatol. 2006 Feb;33(2):207-9.
31 Cleland LG, James MJ, Proudman SM. Fish oil: what the prescriber needs to know. Arthritis Res Ther. 2006;8(1):202. Erratum in: Arthritis Res Ther. 2006;8(4):402.
32 Hampton GR, Nelsen PT. Age related macular degeneration: principles and practice. New York, NY: Raven Press, 1992.
33 Fliesler SJ, Anderson RE. Chemistry and metabolism of lipids in the vertebrate retina. Prog Lipid Res. 1983;22(2):79-131.
34 Bazan NG, Reddy TS, Bazan HE, Birkle DL. Metabolism of arachidonic and docosahexaenoic acids in the retina. Prog Lipid Res. 1986;25(1-4):595-606. Review.
35 Johnson EJ, Chung HY, Caldarella SM, Snodderly DM. The influence of supplemental lutein and docosahexaenoic acid on serum, lipoproteins, and macular pigmentation. Am J Clin Nutr. 2008 May;87(5):1521-9.
36 Neuringer M, Anderson GJ, Connor WE. The essentiality of n-3 fatty acids for the development and function of the retina and brain. Annu Rev Nutr. 1988;8:517-41. Review.
37 Johnson EJ, Schaefer EJ. Potential role of dietary n-3 fatty acids in the prevention of dementia and

macular degeneration. Am J Clin Nutr. 2006 Jun;83(6 Suppl):1494S-1498S. Review.

38 Augood C, Chakravarthy U, Young I, Vioque J, de Jong PT, Bentham G, Rahu M, Seland J, Soubrane G, Tomazzoli L, Topouzis F, Vingerling JR, Fletcher AE. Oily fish consumption, dietary docosahexaenoic acid and eicosapentaenoic acid intakes, and associations with neovascular age-related macular degeneration. Am J Clin Nutr. 2008 Aug;88(2):398-406.
39 Sangiovanni JP, Agrón E, Meleth AD, Reed GF, Sperduto RD, Clemons TE, Chew EY; Age-Related Eye Disease Study Research Group. {omega}-3 Long-chain polyunsaturated fatty acid intake and 12-y incidence of neovascular age-related macular degeneration and central geographic atrophy: AREDS report 30, a prospective cohort study from the Age-Related Eye Disease Study. Am J Clin Nutr. 2009 Dec;90(6):1601-7. Epub 2009 Oct 7.
40 Sosa AL, Albanese E, Prince M, Acosta D, Ferri CP, Guerra M, Huang Y, Jacob KS, de Rodriguez JL, Salas A, Yang F, Gaona C, Joteeshwaran A, Rodriguez G, de la Torre GR, Williams JD, Stewart R. Population normative data for the 10/66 Dementia Research Group cognitive test battery from Latin America, India and China: a cross-sectional survey. BMC Neurol. 2009 Aug 26;9:48.
41 Fontani G, Corradeschi F, Felici A, Alfatti F, Migliorini S, Lodi L. Cognitive and physiological effects of Omega-3 polyunsaturated fatty acid supplementation in healthy subjects. Eur J Clin Invest. 2005 Nov;35(11):691-9.
42 Kalmijn S, Launer LJ, Ott A, Witteman JC, Hofman A, Breteler MM. Dietary fat intake and the risk of incident dementia in the Rotterdam Study. Ann Neurol. 1997 Nov;42(5):776-82.
43 van Gelder BM, Tijhuis M, Kalmijn S, Kromhout D. Fish consumption, n-3 fatty acids, and subsequent 5-y cognitive decline in elderly men: the Zutphen Elderly Study. Am J Clin Nutr. 2007 Apr;85(4):1142-7.
44 Morris MC, Evans DA, Bienias JL, Tangney CC, Bennett DA, Wilson RS, Aggarwal N, Schneider J. Consumption of fish and n-3 fatty acids and risk of incident Alzheimer disease. Arch Neurol. 2003 Jul;60(7):940-6.
45 Kidd PM. Omega-3 DHA and EPA for cognition, behavior, and mood: clinical findings and structural-functional synergies with cell membrane phospholipids. Altern Med Rev. 2007 Sep;12(3):207-27. Review.
46 Quinn JF, Raman R, Thomas RG, Yurko-Mauro K, Nelson EB, Van Dyck C, Galvin JE, Emond J, Jack CR Jr, Weiner M, Shinto L, Aisen PS. Docosahexaenoic acid supplementation and cognitive decline in Alzheimer disease: a randomized trial. JAMA. 2010 Nov 3;304(17):1903-11.
47 Schuchardt JP, Huss M, Stauss-Grabo M, Hahn A. Significance of long-chain polyunsaturated fatty acids (PUFAs) for the development and behaviour of children. Eur J Pediatr. 2010 Feb;169(2):149-64. Epub 2009 Aug 12. Review.
48 McNamara RK, Able J, Jandacek R, Rider T, Tso P, Eliassen JC, Alfieri D, Weber W, Jarvis K, DelBello MP, Strakowski SM, Adler CM. Docosahexaenoic acid supplementation increases prefrontal cortex activation during sustained attention in healthy boys: a placebo-controlled, dose-ranging, functional magnetic resonance imaging study. Am J Clin Nutr. 2010 Apr;91(4):1060-7. Epub 2010 Feb 3.
49 Birch EE, Carlson SE, Hoffman DR, Fitzgerald-Gustafson KM, Fu VL, Drover JR, Castañeda YS, Minns L, Wheaton DK, Mundy D, Marunycz J, Diersen-Schade DA. e DIAMOND (DHA Intake And Measurement Of Neural Development) Study: a double-masked, randomized controlled clinical trial of the maturation of infant visual acuity as a function of the dietary level of docosahexaenoic acid. Am J Clin Nutr. 2010 Apr;91(4):848-59. Epub 2010 Feb 3.
50 Noreen EE, Sass MJ, Crowe ML, Pabon VA, Brandauer J, Averill LK. Effects of supplemental fish oil on resting metabolic rate, body composition, and salivary cortisol in healthy adults. J Int Soc Sports Nutr. 2010 Oct 8;7:31.
51 Couet C, Delarue P, Autoine JM, Lamisse F: Effect of dietary fish oil on body mass and basal fat oxidation in healthy adults. Int J Obes 1997 , 21:637-643
52 Hill AM, Buckley JD, Murphy KJ, Howe PR: Combining fish-oil supplements with regular aerobic exercise improves body composition and cardiovascular disease risk factors. Am J Clin Nutr 2007 , 85:1267-1274.
53 Thorsdottir I, Tomasson H, Gunnarsdottir I, Gisladottir E, Kiely M, Parra MD, Bandarra NM, Schaafsma G, Martinez JA: Randomized trial of weight-loss-diets for young adults varying in fish and fish oil content. Int J Obes (Lond) 2007 , 31:1560-1566.
54 Meydani SN, Dinarello CA. Influence of dietary fatty acids on cytokine production and its clinical implications. Nutr Clin Pract 1993;8:65-72.
55 Pedersen HS, Mulvad G, Seidelin KN, et al. N-3 fatty acids as a risk factor for haemorrhagic stroke. Lancet 1999;353:812-3.

56 Borkman M, Chisholm DJ, Furler SM, et al. Effects of fish oil supplementation on glucose and lipid metabolism in NIDDM. Diabetes 1989;38:1314-9.

57 Pooya Sh, Jalali MD, Jazayery AD, Saedisomeolia A, Eshraghian MR, Toorang F. The efficacy of omega-3 fatty acid supplementation on plasma homocysteine and malondialdehyde levels of type 2 diabetic patients. Nutr Metab Cardiovasc Dis. 2010 Jun;20(5):326-31. Epub 2009 Jun 21.
58 Department of Health and Human Services, US Food and Drug Administration. Substances Affirmed as Generally Recognized as Safe: Menhaden Oil. Federal Register. June 5, 1997, as amended March 23, 2005. Vol. 70(55):14530-14532. US Food and Drug Administration Web site. http://www.cfsan.fda.gov/_lrd/fr050323.html. Accessed September 25, 2008.
59 Harris WS, Pottala JV, Sands SA, Jones PG. Comparison of the effects of fish and fish-oil capsules on the n 3 fatty acid content of blood cells and plasma phospholipids. Am J Clin Nutr. 2007 Dec;86(6):1621-5.
60 Kris-Etherton PM, Hill AM. N-3 fatty acids: food or supplements? J Am Diet Assoc. 2008 Jul;108(7):1125-30.
61 Mozaffarian D. Fish and n-3 fatty acids for the prevention of fatal coronary heart disease and sudden cardiac death. Am J Clin Nutr. 2008 Jun;87(6):1991S-6S.

Advanced Brain Health™

Goal

Until late in the 20th century, the basic theory was that we enter adult life with a set number of brain cells that deteriorate gradually until brain function falls apart. During the past 10 years, neuroscientists have proved that this does not need to be the case. The brain does continue to form new connections and to make changes in response to new demands. Like most every other part of the body, the brain is a "use it or lose it" organ.[1] Despite this new knowledge, it is common for people to experience overall decline in brain function with age. This tendency may be influenced by reduced use of the brain and by limitations in brain nutrition.

Several substances are showing the potential to support brain function and to slow (and possibly stop or reverse) age-related decline in mental function. Among these substances, phosphatidylserine (PS), acetyl-L-carnitine (ALC), alpha-lipoic acid (ALA), and vitamin B-12 have been found to offer support to the maintenance of aging brain function. Following the middle-age years, supplementation with these compounds may balance a decline in the body's production or absorption of these substances that are essential for normal brain and neurological function.[2,3,4]

Rationale

Phosphatidylserine (PS): PS is a natural compound produced in the body and obtained in small amounts in some foods. PS is a special fat-like molecule that is called a phospholipid. It functions as a major component of cell and mitochondrial membranes. PS is thought to be especially important for the normal function of nerve and brain cells.[5,6] PS is the major type of phospholipid in the brain and is known to contribute to several essential components of brain cell function.[7,8] Many animal studies have demonstrated enhanced mental function from providing supplemental PS to older animals.[4] Similarly, several human studies have found that PS supplementation benefited mental functions in older people suffering from various degrees and types of dementia.[5,9,10] Since PS is present in virtually all cells in the body, it is not surprising that PS supplementation is being studied for its likely benefits to many functions of the body.[11] A recent study involving 131 participants concluded that supplementing PS with DHA from fish oils significantly improved cognitive performance compared to placebo users in non-demented elderly with memory complaints.[12] Once again these results support the use of supplementing BEFORE disease takes hold with the goal of staving off age-related declines due to chronic lack of proper brain nutrition.

Acetyl-L-Carnitine (ALC): ALC is a specific form of carnitine that is used for a variety of functions in many types of cells, including brain cells.[13] As well as being central to energy production in brain cells, ALC has been shown to be a powerful antioxidant in stressed brain tissues.[14,15] ALC is synthesized naturally in the body; however, ALC levels may decline in older adults.[16] Common foods such as red meats and milk products contain natural L-carnitine in modest amounts, but these amounts may not make up for the decline observed with aging. One theory of brain aging is based on observations that the energy generating components (mitochondria) in brain cells suffer increased amounts of oxidative damage with age.[17] The acetyl form of L-carnitine has been found to enhance mitochondrial function and to prevent brain mitochondrial decay and decline in mental function in aging animals.[18,19] Several human studies have demonstrated a wide variety of potential benefits to brain and nerve function.[20,21,22,23] Clinical trials have tested ALC supplementation in older people, showing benefits in the treatment of a variety of mental problems.[22,24,25,26] In a 2003 meta-analysis by Montgomery et al. that examined double blind placebo-controlled trials of at least 3 months' duration, ALC showed significant benefit over placebo.[27] Because of ALC qualities as a neuro/cyto protective agent, it continues to be aggressively studied for maintaining and improving brain health.[28,29,30]

Several studies have combined supplementation of ALC with alpha lipoic acid, resulting in a potentially enhanced beneficial effect on aging brain mitochondrial function (see next section).[18,19,31]

Alpha Lipoic Acid (ALA): Due to its essential functions, lipoic acid was initially thought to be a B-vitamin. It was soon realized that it is not a vitamin since the body can synthesize it. Despite its non-

vitamin status, lipoic acid continues to be the subject of extensive research more than 50 years after its discovery.[22,32,33,34,35] Much of the interest focuses on lipoic acid's central role in energy metabolism and in its ability to function as an antioxidant and free radical scavenger in mitochondria.[36] Although ALA is produced naturally in the cells of humans and animals, there is evidence that boosting ALA levels through supplementation can benefit nerve and brain function in older animals.[37,38,39,40,41,42] Human studies of supplementation with ALA have focused primarily on its possible role in the treatment of those with age-related problems in brain function.[33] Studies are needed to confirm that similar supplementation can slow age-related cognitive decline, but animal studies show that benefits are promising.[19,43,44] Lipoic acid supplementation also is being studied for its potential role in the treatment or prevention of a variety of nerve diseases, Type II diabetes, age-related eye conditions, liver disease, cancer, cardiovascular disease, etc.[19]

Vitamin B-12: Among other functions, vitamin B-12 provides essential support for the maintenance of neural tissues, including neural tissues of the brain. Some studies have reported that as many as one out of seven people over the age of 65 develop B12 deficiency due to a declining capacity to absorb the vitamin from foods.[45,46,47] This deficiency was especially prevalent in non-supplement users.[48] A deficiency may take years to develop, but a long-standing deficiency can result in permanent damage to neural tissues if diagnosis and treatment are delayed.[49,50] A recent study showed that higher total intakes, which included supplementation, of vitamins B-6 and B-12 were associated with a decreased likelihood of incident depression for up to 12 years of follow-up, after adjustment for age, sex, race, education, income, and antidepressant medication use. For example, each 10 additional milligrams of vitamin B-6 and 10 additional micrograms of vitamin B-12 were associated with 2% lower odds of depressive symptoms per year.[51] It has also been suggested that marginal deficiencies (i.e. not shown to be deficient by clinical testing) may lead to future brain health problems.[52] Consequently, prophylactic supplementation with vitamin B12 has been suggested as a reasonable precaution to protect vitamin B12 status in older adults with a suggested dose ranging from six to 300 mcg/day.[45]

Typical Use

Suitable for adults age 45 and older interested in supporting brain and nerve function during aging.

- One to three tablets per day with food
- Typical dosage based on age:
  - 45-55 years – one per day
  - 56-65 years – two per day
  - Over 65 years – three per day

Precautions

Advanced Brain Health is considered safe for the general population at the proper dosage in healthy users. Advanced Brain Health is designed to be safe to use along with any other dotFIT additional brain support elements that complement those already present in the dotFIT multivitamin formulas as well as the SuperiorAntioxidant and SuperOmega-3 formulas. Like any dietary supplement, users should consult with their physician and/or pharmacist before taking this supplement, especially if they are also taking any drugs for medical purposes.

Phosphatidylserine is generally well-tolerated[53] when taken at the suggested levels of one to three tablets per day (100 to 300 mg/day). Phosphatidylserine in Advanced Brain Health comes from soybean sources, removing concerns about any risk associated with bovine sources that were commonly used in the early research on the substance. Uncommon side effects of phosphatidylserine include gastrointestinal upset and insomnia.[54,55]

Acetyl-L-carnitine is typically well-tolerated[38] when taken at the suggested dose of one to three tablets per day (350 to 1050 mg/day). Rare side effects have included nausea, gastrointestinal upset, and restlessness.[56,57]

Alpha lipoic acid has been well-tolerated in clinical studies lasting from four months to two years at the suggested dose of one to three tablets per day (200 to 600 mg/day).[58,59,60] Studies of lipoic acid supplementation in people with conditions like Type II diabetes and peripheral arterial disease have reported

potential minor side effects such as tingling in legs and feet and mild stomach queasiness. However, it was difficult to know if this was caused by the supplement or the condition.[61]

Vitamin B-12 is very safe when taken at the dosage in this formula. Since toxicity from vitamin B12 is virtually unknown, no tolerable upper intake level has been established for vitamin B12 by the Institute of Medicine.[62]

Contraindications

The dotFIT Advanced Brain Health formula is contraindicated in pregnancy and lactation and for anyone suffering adverse reactions to any of the ingredients.

Adverse Reactions

There should be no serious side effects in healthy users at the recommended doses.

Phosphatidylserine: Uncommon side effects include gastrointestinal upset (300 mg/day or more) and insomnia (600 mg/day or more).[54,55]

Acetyl-L-carnitine: Side effects uncommon; those reported include gastrointestinal upset and agitation.[56,57,63]

Alpha-lipoic acid: Side effects are usually not seen unless dosage exceeds 600 mg/day. Reported reactions include headache, skin rash and stomach upset.[61,64]

Vitamin B12: Side effects unknown.

Upper Limit/Toxicity

The Institute of Medicine has not set an upper limit (UL) for any of the ingredients contained in the dotFIT Advanced Brain Health formula.

Phosphatidylserine: No upper limit has been established for human use. A 12-week study of people over 57 years of age concluded that PS is a safe supplement for elderly individuals at doses up to 600 mg per day (taken in doses of 200 mg three times daily).[65]

Acetyl-L-Carnitine: A recent risk assessment for L-carnitine established an "Upper Level for Supplements" (ULS) for L-carnitine at 2000 mg per day which is equivalent to about 3000 mg of acetyl-Lcarnitine.[66]

Alpha-lipoic acid: No upper limit has been established for human use. A two-year study of laboratory rats reported a no-observed-adverse-effect level (NOAEL) of 60 mg per kilogram body weight.[67] The dose in the dotFIT Advanced Brain Health formula is less than 1/10 of this dose.

Vitamin B12: No specific levels of intake are known to be toxic. Some theoretical concern has been expressed for excessively high intakes for extended periods of time. Carmel R. Efficacy and safety of fortification and supplementation with vitamin B12: biochemical and physiological effects.[68]

Summary

Purpose

- The goal of the Advanced Brain Health formula is to provide substances that help to support brain function and slow age-related decline in mental functions
- Complement to the dotFIT multivitamin and mineral, SuperiorAntioxidant, and SuperOmega-3 formulas

- The Advanced Brain Health formula rounds out the dotFIT longevity program by providing brainsupport compounds that add to and extend upon the important brain nutrients and protective components already present in the dotFIT multivitamin, antioxidant, and Omega-3 supplements

Unique Features

- Contains only well-researched brain support substances in their proper amounts
- Accurately complements the dotFIT multivitamin, antioxidant, and Omega-3 formulas
- This formula considers use of other dotFIT products to help the user maintain a safe and optimal range of total nutrient intake
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Supplement Facts

Serving Size: 2 Capsules — Servings Per Container: 60

Amount Per Serving		% Daily Value *
Vitamin B12 (as Cyanocobalamin)	100 mcg	1,667%*
Acetyl-L Carnitine	500 mg	**
Phosphatidylserine	100 mg	**
Alpha Lipoic Acid	100 mg	**

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Gelatin, Magnesium Stearate, Microcrystalline Cellulose, Titanium Dioxide.

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Yeast, Artificial flavors, or Preservatives added.

References

1 IOM (Institute of Medicine). 2008. From molecules to minds: Challenges for the 21st century workshop summary. Washington, DC: The National Academies Press.
2 McDaniel MA, Maier SF, Einstein GO. "Brain-specific" nutrients: a memory cure? Nutrition. 2003 Nov-Dec;19(11-12):957-75.
3 Vogiatzoglou A, Refsum H, Johnston C, Smith SM, Bradley KM, de Jager C, Budge MM, Smith AD. Vitamin B12 status and rate of brain volume loss in community-dwelling elderly. Neurology. 2008 Sep 9;71(11):826-32.
4 Suchy J, Chan A, Shea TB. Dietary supplementation with a combination of alpha-lipoic acid, acetyl-L-carnitine, glycerophosphocoline, docosahexaenoic acid, and phosphatidylserine reduces oxidative damage to murine brain and improves cognitive performance. Nutr Res. 2009 Jan;29(1):70-4.
5 Pepeu G, Pepeu IM, Amaducci L. A review of phosphatidylserine pharmacological and clinical effects. Is phosphatidylserine a drug for the ageing brain? Pharmacol Res. 1996 Feb;33(2):73-80.
6 Mozzi R, Buratta S, Goracci G. Metabolism and functions of phosphatidylserine in mammalian brain. Neurochem Res. 2003 Feb;28(2):195-214.
7 Crook T, Petrie W, Wells C, Massari DC. Effects of phosphatidylserine in Alzheimer's disease. Psychopharmacol Bull 1992;28:61-6.
8 Blokland A, Honig W, Brouns F, Jolles J. Cognition-enhancing properties of subchronic phosphatidylserine (PS) treatment in middle-aged rats: comparison of bovine cortex PS with egg PS and soybean PS. Nutrition 1999;15:778-83.
9 Kidd PM. PS (PhosphatidylSerine), Nature's Brain Booster, 2nd ed. St. George, UT: Total Health Communications; 2007.
10 Cenacchi T, Bertoldin T, Farina C, et al. Cognitive decline in the elderly: a double-blind, placebo-controlled multicenter study on efficacy of phosphatidylserine administration. Aging (Milano) 1993;5:123-133.
11 Kingsley M. Effects of phosphatidylserine supplementation on exercising humans. Sports Med. 2006;36(8):657-69.
12 Vakhapova V, Cohen T, Richter Y, Herzog Y, Korczyn AD. Phosphatidylserine containing omega-3 fatty acids may improve memory abilities in non-demented elderly with memory complaints: a double-blind placebo-controlled trial. Dement Cogn Disord. 2010;29(5):467-74. Epub 2010 Jun 3.
13 Rebouche CJ. Kinetics, pharmacokinetics, and regulation of L-carnitine and acetyl-L-carnitine metabolism. Ann N Y Acad Sci 2004;1033:30-41.

14 Altun ZS, Günes D, Aktas S, Erbayraktar Z, Olgun N. Protective effects of acetyl-L-carnitine on cisplatin cytotoxicity and oxidative stress in neuroblastoma. Neurochem Res. 2010 Mar;35(3):437-43. Epub 2009 Oct 23.
15 Rump TJ, Muneer PM, Szlachetka AM, Lamb A, Haorei C, Alikunju S, Xiong H, Keblesh J, Liu J, Zimmerman MC, Jones J, Donohue TM Jr, Persidsky Y, Haorah J. Acetyl-L-carnitine protects neuronal function from alcohol-induced oxidative damage in the brain. Free Radic Biol Med. 2010 Nov 30;49(10):1494-504. Epub 2010 Aug 12.
16 Malaguarnera M, Gargante MP, Cristaldi E, Colonna V, Messano M, Koverech A, Neri S, Vacante M, Cammalleri L, Motta M. Acetyl L-carnitine (ALC) treatment in elderly patients with fatigue. Arch Gerontol Geriatr. 2008 Mar-Apr;46(2):181-90. Epub 2007 Jul 20.
17 Head E, Liu J, Hagen TM, Muggenburg BA, Milgram NW, Ames BN, Cotman CW. Oxidative damage increases with age in a canine model of human brain aging. J Neurochem. 2002 Jul;82(2):375-81.
18 Milgram NW, Araujo JA, Hagen TM, Treadwell BV, Ames BN. Acetyl-L-carnitine and alpha-lipoic acid supplementation of aged beagle dogs improves learning in two landmark discrimination tests. FASEB J. 2007 Nov;21(13):3756-62. Epub 2007 Jul 10.
19 Long J, Gao F, Tong L, Cotman CW, Ames BN, Liu J. Mitochondrial decay in the brains of old rats: print] ameliorating effect of alphalipoic acid and acetyl-l-carnitine. Neurochem Res. 2008 Oct 10. [Epub ahead of print]
20 Pettegrew JW, Levine J, McClure RJ. Acetyl-L-carnitine physical-chemical, metabolic, and therapeutic properties: relevance for its mode of action in Alzheimer's disease and geriatric depression. Mol Psychiatry 2000; 5: 616-632.
21 Rossini M, Di Munno O, Valentini G, Bianchi G, Biasi G, Cacace E, Malesci D, La Montagna G, Viapiana O, Adami S. Doubleblind, multicenter trial comparing acetyl l-carnitine with placebo in the treatment of fibromyalgia patients. Clin Exp Rheumatol. 2007 Mar-Apr;25(2):182-8.
22 Soczynska JK, Kennedy SH, Chow CS, Woldeyohannes HO, Konarski JZ, McIntyre RS. Acetyl-L-carnitine and alpha-lipoic acid: possible neurotherapeutic agents for mood disorders? Expert Opin Investig Drugs. 2008 Jun;17(6):827-43. Review.
23 Malaguarnera M, Gargante MP, Cristaldi E, Colonna V, Messano M, Koverech A, Neri S, Vacante M, Cammalleri L, Motta M. Acetyl L-carnitine (ALC) treatment in elderly patients with fatigue. Arch Gerontol Geriatr. 2008 Mar-Apr;46(2):181-90. Epub 2007 Jul 20.
24 Cucinotta D, Passeri M, Ventura S, et al. Multicenter clinical placebo-controlled study with acetyl-L-carnitine (ALC) in the treatment of mildly demented elderly patients Drug Development Res 1988;14:213-6.
25 Passeri M, Cucinotta D, Bonati PA, et al. Acetyl-L-carnitine in the treatment of mildly demented elderly patients. Int J Clin Pharmacol Res 1990;10:75-9.
26 Salvioli G, Neri M. L-acetylcarnitine treatment of mental decline in the elderly. Drugs Exp Clin Res 1994;20:169-76.
27 Montgomery SA, Thal LJ, Amrein R. Meta-analysis of double blind randomized controlled clinical trials of acetyl-L-carnitine versus placebo in the treatment of mild cognitive impairment and mild Alzheimer's disease. Int Clin Psychopharmacol 2003;18:61-71.
28 Bagetta V, Barone I, Ghiglieri V, Di Filippo M, Sgobio C, Bernardi G, Calabresi P, Picconi B. Acetyl-L-Carnitine selectively prevents post-ischemic LTP via a possible action on mitochondrial energy metabolism. Neuropharmacology. 2008 Aug;55(2):223-9. Epub 2008 May 24.
29 Traina G, Federighi G, Brunelli M, Scuri R. Cytoprotective effect of acetyl-L-carnitine evidenced by analysis of gene expression in the rat brain. Mol Neurobiol. 2009 Apr;39(2):101-6. Epub 2009 Feb 7.
30 Calabrese V, Cornelius C, Mancuso C, Lentile R, Stella AM, Butterfield DA. Redox homeostasis and cellular stress response in aging and neurodegeneration. Methods Mol Biol. 2010;610:285-308.
31 Shenk JC, Liu J, Fischbach K, Xu K, Puchowicz M, Obrenovich ME, Gasimov E, Alvarez LM, Ames BN, Lamanna JC, Aliev G. The effect of acetyl-L-carnitine and R-alpha-lipoic acid treatment in ApoE4 mouse as a model of human Alzheimer's disease. J Neurol Sci. 2009 Aug 15;283(1-2):199-206. Epub 2009 Apr 1.
32 Petersen Shay K, Moreau RF, Smith EJ, Hagen TM. Is alpha-lipoic acid a scavenger of reactive oxygen species in vivo? Evidence for its initiation of stress signaling pathways that promote endogenous antioxidant capacity. IUBMB Life. 2008 Jun;60(6):362-7.
33 Liu J. The effects and mechanisms of mitochondrial nutrient alpha-lipoic acid on improving age-associated mitochondrial and cognitive dysfunction: an overview. Neurochem Res. 2008 Jan;33(1):194-203.
34 Bolognesi ML, Minarini A, Tumiatti V, Melchiorre C. Lipoic acid, a lead structure for multi-target-

directed drugs for neurodegeneration. Mini Rev Med Chem. 2006 Nov;6(11):1269-74. Review.
35 Bilska A, Wlodek L. Lipoic acid - the drug of the future? Pharmacol Rep. 2005 Sep-Oct;57(5):570-7. Review.
36 Packer L, Witt EH, Tritschler HJ. alpha-Lipoic acid as a biological antioxidant. Free Radic Biol Med. 1995 Aug;19(2):227-50. Review.
37 Stoll S, Hartmann H, Cohen SA, Müller WE. The potent free radical scavenger alpha-lipoic acid improves memory in aged mice: putative relationship to NMDA receptor deficits. Pharmacol Biochem Behav. 1993 Dec;46(4):799-805.
38 Farr SA, Poon HF, Dogrukol-Ak D, Drake J, Banks WA, Eyerman E, Butterfield DA, Morley JE. The antioxidants alpha-lipoic acid and N-acetylcysteine reverse memory impairment and brain oxidative stress in aged SAMP8 mice. J Neurochem. 2003 Mar;84(5):1173-83.
39 Poon HF, Farr SA, Thongboonkerd V, Lynn BC, Banks WA, Morley JE, Klein JB, Butterfield DA. Proteomic analysis of specific brain proteins in aged SAMP8 mice treated with alpha-lipoic acid: implications for aging and age-related neurodegenerative disorders. Neurochem Int. 2005 Jan;46(2):159-68.
40 Cui X, Zuo P, Zhang Q, Li X, Hu Y, Long J, Packer L, Liu J. Chronic systemic D-galactose exposure induces memory loss, neurodegeneration, and oxidative damage in mice: protective effects of R-alpha-lipoic acid. J Neurosci Res. 2006 Aug 15;84(3):647-54.
41 Quinn JF, Bussiere JR, Hammond RS, Montine TJ, Henson E, Jones RE, Stackman RW Jr. Chronic dietary alpha-lipoic acid reduces deficits in hippocampal memory of aged Tg2576 mice. Neurobiol Aging. 2007 Feb;28(2):213-25. Epub 2006 Jan 31.
42 Manda K, Ueno M, Moritake T, Anzai K. Radiation-induced cognitive dysfunction and cerebellar oxidative stress in mice: protective effect of alpha-lipoic acid. Behav Brain Res. 2007 Feb 12;177(1):7-14. Epub 2006 Dec 4.
43 Ames BN. The metabolic tune-up: metabolic harmony and disease prevention. J Nutr. 2003 May; 133(5 Suppl 1):1544S-8S.
44 Ames BN. Delaying the mitochondrial decay of aging. Ann N Y Acad Sci. 2004 Jun; 1019: 406-11.
45 Stabler SP, Lindenbaum J, Allen RH. Vitamin B-12 deficiency in the elderly: current dilemmas. Am J Clin Nutr. 1997 Oct;66(4):741-9.
46 Smith AD. Vitamin B12 status and rate of brain volume loss in community-dwelling elderly. Neurology. 2008 Sep 9;71(11):826-32.
47 Sánchez H, Albala C, Herlramp F E, Verdugo R, Lavados M, Castillo JL, Lera L, Uauy R. [Prevalence of vitamin B-12 deficiency in older adults]. Rev Med Chil. 2010 Jan;138(1):44-52. Epub 2010 Mar 26. Spanish.
48 Johnson MA, Hausman DB, Davey A, Poon LW, Allen RH, Stabler SP; Georgia Centenarian Study. Vitamin B12 deficiency in African American and white octogenarians and centenarians in Georgia. J Nutr Health Aging. 2010 May;14(5):339-45.
49 Savage DG, Lindenbaum J. Neurological complications of acquired cobalamin deficiency: clinical aspects. Baillieres Clin Haematol. 1995 Sep;8(3):657-78.
50 Andrès E, Federici L, Affenberger S, Vidal-Alaball J, Loukili NH, Zimmer J, Kaltenbach G. B12 deficiency: a look beyond pernicious anemia. J Fam Pract. 2007 Jul;56(7):537-42.
51 Skarupski KA, Tangney C, Li H, Ouyang B, Evans DA, Morris MC. Longitudinal association of vitamin B-6, folate, and vitamin B-12 with depressive symptoms among older adults over time. Am J Clin Nutr. 2010 Aug;92(2):330-5. Epub 2010 Jun 2.
52 Smith AD, Refsum H. Vitamin B-12 and cognition in the elderly. Am J Clin Nutr. 2009 Feb;89(2):707S-11S. Epub 2008 Dec 30. Review.
53 Jellin JM, Gregory PJ, Batz F, Hitchens K, et al. Pharmacist's Letter/Prescriber's Letter Natural Medicines Comprehensive Database. Stockton, CA: Therapeutic Research Faculty. Online version, October 2008.
54 Pepping J. Phosphatidylserine. Am J Health-Syst Pharm 1999;56:2038,2043-4.
55 Kidd PM. Phosphatidylserine; Membrane nutrient for memory. A clinical and mechanistic assessment. Altern Med Rev 1996;1:70-84.
56 De Grandis D, Minardi C. Acetyl-L-carnitine (levacecarnine) in the treatment of diabetic neuropathy. A long-term, randomised, double-blind, placebo-controlled study. Drugs R D 2002; 3:223-31.
57 Sima AAF, Calvani M, Mehra M, et al. Acetyl-L-carnitine improves pain, nerve regeneration, and vibratory perception in patients with chronic diabetic neuropathy: An analysis of two randomized, placebo-controlled trials. Diabetes Care 2005;28:89-94.
58 Reljanovic M, Reichel G, Rett K, et al. Treatment of diabetic polyneuropathy with the antioxidant

thioctic acid (alpha-lipoic acid): A 2-year, multicenter, randomized, double-blind, placebo-controlled trial

(ALADIN II). Alpha Lipoic Acid in Diabetic Neuropathy [abstract]. Free Radic Res 1999;31:171-7.
59 Ziegler D, Hanefeld M, Ruhnau K, et al. Treatment of symptomatic diabetic polyneuropathy with the antioxidant alpha-lipoic acid: A 7-month, multicenter, randomized, controlled trial (ALADIN III Study). Diabetes Care 1999;22:1296-301.
60 Ametov AS, Barinov A, Dyck PJ, et al. The sensory symptoms of diabetic polyneuropathy are improved with alpha-lipoic acid. Diabetes Care 2003;26:770-6.
61 Vincent HK, Bourguignon CM, Vincent KR, Taylor AG. Effects of alpha-lipoic acid supplementation in peripheral arterial disease: a pilot study. J Alt Complement Med 2007;13:577-84.
62 IOM (Institute of Medicine). 1998. Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Washington, DC: The National Academies Press.
63 Spagnoli A, Lucca U, Menasce G, et al. Long-term acetyl-L-carnitine treatment in Alzheimer's Disease. Neurology 1991;41:1726-32.
64 Ziegler D, Ametov A, Barinov A, Dyck PJ, Gurieva I, Low PA, Munzel U, Yakhno N, Raz I, Novosadova M, Maus J, Samigullin R. Oral treatment with alpha-lipoic acid improves symptomatic diabetic polyneuropathy: the SYDNEY 2 trial. Diabetes Care. 2006 Nov;29(11):2365-70.
65 Jorissen BL, Brouns F, Van Boxtel MP, Riedel WJ. Safety of soy-derived phosphatidylserine in elderly people. Nutr Neurosci. 2002 Oct;5(5):337-43.
66 Hathcock JN, Shao A. Risk assessment for carnitine. Regul Toxicol Pharmacol. 2006 Oct;46(1):23-8.
67 Cremer DR, Rabeler R, Roberts A, Lynch B. Long-term safety of alpha-lipoic acid (ALA) consumption: A 2-year study. Regul Toxicol Pharmacol. 2006 Dec;46(3):193-201.
68 Carmel R. Efficacy and safety of fortification and supplementation with vitamin B12: biochemical and physiological effects. Food Nutr Bull. 2008 Jun;29(2 Suppl):S177-87.

Fitness & Performance Enhancing Dietary Supplements

weight loss dotFIT

The goal of supplements in this category is to assist the user in complying with the daily routine that leads to weight reduction by acting in one or more of the following ways:

- Help create and maintain a calorie deficit by increasing daily calorie expenditure when compared to a non-supplemented state
- Raise energy levels that may make one more active throughout the day
- Reduce the drive to consume food
- Decrease calorie absorption

The dieter would cease supplementation once the weight goal is reached or when they have their daily routines under control to continue making progress without supplements.

See Appendix 2: Three proven strategies for weight reduction, maintenance of weight loss and prevention of weight gain.

FatRelease®

FatRelease contains the necessary compounds to support the health and proper functioning of the liver while supplying ingredients designed to decrease dietary fat absorption, support appetite and deliver the many potential benefits of green tea (EGCG).[1] As the body gains fat weight so does the liver, leading to sluggish performance and oxidative stress. Both conditions can have a negative effect on the liver's health[2,3] and ability to burn fat.[4,5]

Rationale

Choline is a lipotropic agent that has been shown to hasten the removal of fat from the liver.[6] Choline is also the starting material for several important compounds including one's involved with the secretion of very low density lipoproteins (VLDL) thus again, helping to rid the liver of fat.[7] Recently the Institute of Medicine (IOM) established the adequate intake (AI) of choline at 425-550mgs/day for women and men respectively and that choline deficiency can have a negative impact on different disease states especially related to fatty livers.[8,9] There is now evidence that current choline recommendations may be suboptimal for a large percentage of the population and that many others may have intakes below even the current recommendations.[10,11,12,13]

Milk Thistle has been used safely for centuries in treatment of liver problems including improving circulation, maintaining the integrity of liver cell membranes while increasing liver's regenerative ability and formation of new cells.[14,15,16] Milk thistle also exhibits antiviral, anti-inflammatory, and immunomodulatory functions in human liver and immune cells.[17]

N-Acetyl cysteine (NAC) is added because it acts as an antioxidant and hepatoprotectant in order to help combat oxidative stress[18] including that brought on by accumulating fat in the liver.[19,20]

Epigallocatechin gallate (EGCG) from Green tea also works as an antioxidant and has the potential to destroy fat cells,[21] increase overall energy expenditure,[22] and has demonstrated positive effects on fat oxidation.[23,24,25,26,27,28] Recent findings suggest that green tea catechin consumption enhances exercise-induced changes in abdominal fat and serum triglycerides.[29]

Rhododendron caucasicum (RC) has been shown to decrease the body's absorption of dietary fat by inhibiting gastrointestinal lipase (enzyme that prepares dietary fat for absorption) thus reducing absorbed calories.[30] During three months of clinical trials, patients who received Rhododendron caucasicum spring leaves extract, in conjunction with a low calorie diet, reduced their original weight from 10 to 20 pounds,
losing two to three times more weight than the placebo subjects (see Figure 1).[30]

Engelhardtia chrysolepis has demonstrated superior antioxidant activity in suppressing lipid peroxidation and has also been shown to inhibit a key enzyme involved in the making of cholesterol.[31]

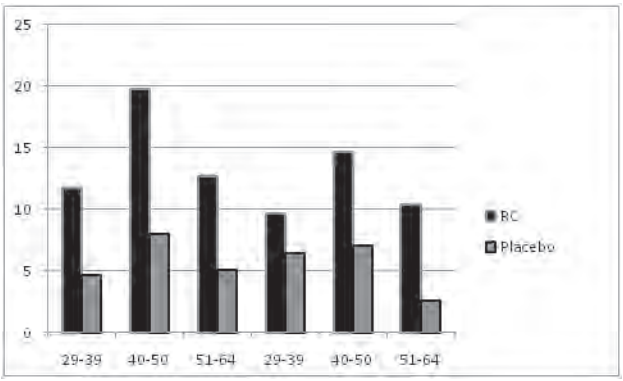

Figure 1: As demonstrated in the graph, during three months of dieting, the Rhododendron group lost two to three hundred percent more weight than the placebo subjects.

Typical Use

Non-stimulant fat-loss aid

- Recommended for people who struggle with controlling fat intake
- Can be used alone or as part of the dotFIT LeanPak90
- Take one tablet three times daily, 30 minutes before meals and with at least 8 oz. of water
- Discontinue after reaching fat loss goal

Precautions

FatRelease is generally considered a safe fat-loss aid.

Contraindications

FatRelease is contraindicated in pregnancy and lactation because of a lack of data for this population.

Adverse Reactions

EGCG: Typical doses range from one to 10 cups of green tea per day without any adverse events.[32]

Choline is not likely to cause side effects at doses up to 3000 mg/day.[33]

Rhododendron caucasicum is well-tolerated in the recommended dosage.[30]

Upper Limit/Toxicity

Choline: The UL for choline is 3500 mg/day and the LOAEL is 7500 mg/day.

NAC: The LD50 for NAC in mice is 7888 mg/kg and in rats is 6000 mg/kg. An AMES test performed on NAC was negative for mutagenicity.[16]

Milk Thistle: Is considered relatively safe for long-term use.[34]

EGCG: High doses of green tea or green tea extract, equivalent to 21-25 cups of tea per day can cause gastrointestinal distress.[35,36]

Rhododendron caucasicum and Engelhardtia chrysolepis: no data available at this time.

Summary

Purpose

- Supplies many of the nutrients involved in fat metabolism
- For people who struggle with controlling fat intake
- Non-stimulant body fat/weight reduction aid
- For very overweight or obese people (females >32% BF & males >22) to support liver health

Unique Features

- The product works at many different levels within the body (appetite, metabolism, fat absorption, etc.) to support the loss of body fat
- Blend is proprietary to dotFIT
- Can be used alone or as part of the dotFIT LeanPak90®
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Supplement Facts

Serving Size: 1 Tablet — Servings Per Container: 90

Amount Per Serving	% Daily Value*
Green Tea Extract (Leaf) [Standardized for 98% Polyphenols (196mg), 75% Catechins (150mg), 45% EGCG (90 mg), 7% Caffeine (naturally occurring - 14 mg)]	200 mg **
Choline (as Choline Bitartrate)	133 mg **
N-Acetyl Cysteine (NAC)	50 mg **
Milk Thistle Seed Extract (80% Silymarin)	166 mg **
dotFIT® Proprietary Herbal Complex (Rhododendron caucasicum and Engelhardtia chrysolepis)	133 mg **

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

** % Daily Value not established.

Other Ingredients: Calcium Phosphate, Microcrystalline Cellulose, Croscarmellose, Stearic acid (Vegetable source), Silicon Dioxide, and Magnesium Stearate (Vegetable source).

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial Coloring, Flavoring or Preservatives added.

WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. Do not use if safety seal under cap is broken or missing. Store in a cool dry place. **KEEP OUT OF REACH OF CHILDREN.**

†These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

References

1 Hursel R, Viechtbauer W, Westerterp-Plantenga MS. The effects of green tea on weight loss and weight maintenance: a meta-analysis. Int J Obes (Lond). 2009 Sep;33(9):956-61. Epub 2009 Jul 14. Review.
2 Jiang J, Torok N. Nonalcoholic steatohepatitis and the metabolic syndrome. Metab Syndr Relat Disord. 2008 Spring;6(1):1-7. Review.
3 Tilg H, Moschen AR. Inflammatory mechanisms in the regulation of insulin resistance. Mol Med. 2008 Mar-Apr;14(3-4):222-31. Review.
4 Schiff L, Schiff ER. Diseases of the liver, 6th ed. Philadelphia: JB Lippincott Company;1987.
5 Dulloo AG, Antic V, Montani JP. Ectopic fat stores: housekeepers that can overspill into weapons of lean body mass destruction. Int J Obes Relat Metab Disord. 2004 Dec;28 Suppl 4:S1-2.
6 Michel V, Yuan Z, Ramsubir S, Bakovic M. Choline transport for phospholipid synthesis. Exp Biol Med (Maywood). 2006 May;231(5):490-504. Review.
7 Vance DE. Role of phosphatidylcholine biosynthesis in the regulation of lipoprotein homeostasis. Curr Opin Lipidol. 2008 Jun;19(3):229-34. Review.
8 Zeisel SH, da Costa KA. Choline: an essential nutrient for public health. Nutr Rev. 2009 Nov;67(11):615-23. Review.
9 Li Z, Vance D. Phosphatidylcholine and choline homeostasis. J Lipid Res. 2008;49:1187–1194.
10 Food and Nutrition Board, Institute of Medicine. Dietary Reference Intakes: Thiamin, Riboflavin, Niacin, Vitamin B-6, Vitamin B012, Pantothenic Acid, Biotin, and Choline. Washington, D.C.: National Academy of Sciences; 1998. pp. 390–422.
11 Penry J, Manore M. Choline: an important micronutirent for maximal endurance-exercise performance? Int J Sport Nutr Exerc Metab. 2008;18:191–203.
12 Zeisel S. Choline: Critical role during fetal development and dietary requirements in adults. Annu Rev Nutr. 2006;26:229–250.
13 Caudill MA. Pre- and postnatal health: evidence of increased choline needs. J Am Diet Assoc. 2010 Aug;110(8):1198-206. Review.
14 Giese LA. Milk thistle and the treatment of hepatitis. Gastroenterol Nurs. 2001 Mar-Apr;24(2):95-7.
15 Trappoliere M, Tuccillo C, Federico A, Di Leva A, Niosi M, D'Alessio C, Capasso R, Coppola F, Dauria M, Loguercio C. The treatment of NAFLD. Eur Rev Med Pharmacol Sci. 2005 Sep-Oct;9(5):299-304. Review.
16 Flora K, Hahn M, Rosen H, Benner K. Milk thistle (Silybum marianum) for the therapy of liver disease. Am J Gastroenterol. 1998 Feb;93(2):139-43.
17 Polyak SJ, Morishima C, Lohmann V, Pal S, Lee DY, Liu Y, Graf TN, Oberlies NH. Identification of hepato-protective flavonolignans from silymarin. Proc Natl Acad Sci U S A. 2010 Mar 30;107(13):5995-9. Epub 2010 Mar 15.
18 Yedjou CG, Tchounwou CK, Haile S, Edwards F, Tchounwou PB. N-acetyl-cysteine protects against DNA damage associated with lead toxicity in HepG2 cells. Ethn Dis. 2010 Winter;20(1 Suppl 1):S1-101-3.
19 Angulo P. Treatment of nonalcoholic fatty liver disease. Ann Hepatol. 2002 Jan-Mar;1(1):12-9. Review.
20 Kelly GS. Clinical applications of N-acetylcysteine. Altern Med Rev. 1998 Apr;3(2):114-27. Review.

21 Lin J, Della-Fera MA, Baile CA. Green tea polyphenol epigallocatechin gallate inhibits adipogenesis and induces apoptosis in 3T3-L1 adipocytes. Obes Res. 2005 Jun;13(6):982-90.
22 Murase T, Nagasawa A, Suzuki J, Hase T, Tokimitsu I. Beneficial effects of tea catechins on diet-induced obesity: stimulation of lipid catabolism in the liver. Int J Obes Relat Metab Disord. 2002 Nov;26(11):1459-64.
23 Diepvens K, Westerterp KR, Westerterp-Plantenga MS. Obesity and thermogenesis related to the consumption of caffeine, ephedrine, capsaicin and green tea. Am J Physiol Regul Integr Comp Physiol. 2006 Jul 13; [Epub ahead of print]
24 Dulloo AG, Seydoux J, Girardier L, Chantre P, Vandermander J. Green tea and thermogenesis: interactions between catechinpolyphenols, caffeine and sympathetic activity. Int J Obes Relat Metab Disord. 2000 Feb;24(2):252-8.
25 Berube-Parent S, Pelletier C, Dore J, Tremblay A. Effects of encapsulated green tea and Guarana extracts containing a mixture of epigallocatechin-3-gallate and caffeine on 24 h energy expenditure and fat oxidation in men. Br J Nutr. 2005 Sep;94(3):432- 6.
26 Nagao T, Meguro S, Soga S, Otsuka A, Tomonobu K, Fumoto S, Chikama A, Mori K, Yuzawa M, Watanabe H, Hase T, Tanaka Y, Tokimitsu I, Shimasaki H, Itakura H. Tea catechins suppress accumulation of body fat in humans. J Oleo Sci 2001; 50: 717– 728.
27 Dulloo AG, Duret C, Rohrer D, Girardier L, Mensi N, Fathi M, Chantre P, Vandermander J. Efficacy of a green tea extract rich in catechin polyphenols and caffeine in increasing 24-h energy expenditure and fat oxidation in humans. Am J Clin Nutr. 1999 Dec;70(6):1040-5.
28 Zheng G, Sayama K, Okubo T, Juneja LR, Oguni I. Anti-obesity effects of three major components of green tea, catechins, caffeine and theanine, in mice. In Vivo. 2004 Jan-Feb;18(1):55-62.
29 Maki KC, Reeves MS, Farmer M, Yasunaga K, Matsuo N, Katsuragi Y, Komikado M, Tokimitsu I, Wilder D, Jones F, Blumberg JB, Cartwright Y. Green tea catechin consumption enhances exercise-induced abdominal fat loss in overweight and obese adults. J Nutr. 2009 Feb;139(2):264-70. Epub 2008 Dec 11.
30 Abidov T, Grachev SV, Klimenov AL, Kalyuzhin OV. Effect of Rhododendron caucasicum extract on body weight and dietary lipids absorption in obese patients: a double-blind placebo controlled clinical study. Final report: Russian Ministry of Health; Grant: No 03-122-1997; Clinical Study; Project No: 0101-1997. 8 pp.
31 Abidov MT, Grachev SV, Klimenov AL, Kalyuzhin OV. The effects of Aralox, a phytomedicine, consisting of standardized extracts of Aralia mandshurica (Araliaceae) and Engelhardtia chrysolepis (Juglandaceae), on body fat loss, lipolytic activity and adipocytes perilipins, in obese, non-diabetic women on a restricted calorie diet is investigated in a double-blind, randomized, placebo-controlled clinical trial. Remedium Medical Journal, Russian Academy of Sciences 2005:35-47.
32 Nemecz G. Green tea. US Pharm 2000;May:67-70.
33 Yates AA, Schlicker SA, Suitor CW. Dietary reference intakes: The new basis for recommendations for calcium and related nutrients, B vitamins, and choline. J Am Diet Assoc 1998;98:699-706.
34 Boerth J, Strong KM. The clinical utility of milk thistle (Silybum marianum) in cirrhosis of the liver. J Herb Pharmacother. 2002;2(2):11-7.
35 Pisters KM, Newman RA, Coldman B, et al. Phase I trial of oral green tea extract in adult patients with solid tumors. J Clin Oncol 2001;19:1830-8.
36 Jatoi A, Ellison N, Burch PA, et al. A phase II trial of green tea in the treatment of patients with androgen independent metastatic prostate carcinoma. Cancer 2003;97:1442-6.

CarbRepel®

CarbRepel contains a fibrous blend with citrus pectin to support appetite control while also containing a unique extract that has been shown to significantly reduce the body's absorption of starches from carbohydrates. The combined goal of this product is to reduce voluntary caloric intake and absorption of unneeded calories in order to ease and accelerate a user's body fat reduction when compared to a non-supplemented state. CarbRepel works through different and complimentary body-weight regulation pathways than FatRelease® and ThermAccel®, making it ideal for cycling or use by itself, especially for people who tend to overeat carbohydrates/sugars.

Rationale

Phase 2®, a proprietary extract of the bean Phaseolus vulgaris, contains phaseolamin, which can block the action of alpha amylase, the enzyme that breaks down carbohydrates and allows them to be absorbed into your body. Five hundred to 1000 mgs of this natural extract has been shown to dramatically reduce the absorption of starches (thus calories) resulting in significantly greater weight loss in numerous studies when compared to placebo.[1,2,3,4,5,6,7] (See Figure 2.)

Low glycemic diets have been associated with healthier outcomes[8] including improved blood sugar control and insulin sensitivity[9] and a longer feeling of fullness.[10] Recently Phase 2 was tested for its ability to lower the glycemic index (GI) of ingested carbohydrate. Using white bread as the test carbohydrate, Phase 2 was found to significantly reduce its GI thus demonstrating its ability to improve the GI of meals that include simple starches/carbohydrates.[11]

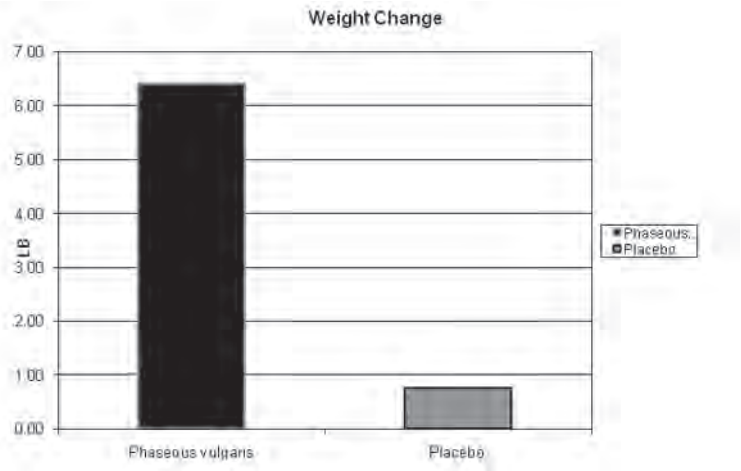

Figure 2: Subjects consumed a 2000-2200 calorie carbohydrate-rich diet. The Phase 2 group experienced ~700% greater weight loss compared to the placebo..

Citrus Pectin is a fiber found in many fruits and has been demonstrated to slow gastric emptying[12] – in other words, it helps keep food in the stomach longer. Proper use of pectin may make a significant contribution to controlling appetite by allowing the user to feel fuller sooner and longer thus potentially delaying or reducing the next meal.[13,14]

Pomegranate leaf extract in proper amounts may help support a person's lipid profile (total cholesterol, trigylcerides, etc) especially when consuming foods high in fat.[15]

††The trademark Phase 2 Starch Neutralizer® is being used under license.

Typical Use

- A non-stimulant fat loss and appetite aid for those who tend to overeat carbohydrates

- Anyone seeking to enhance body fat reduction without affecting the central nervous system (CNS)
- Discontinue after reaching body fat goal
- Can be used alone or as part of the LeanPak90®
- Take 2 tablets twice daily, 30 minutes before your largest carbohydrate containing meals or snacks with at least 8 oz of water

Precautions

CarbRepel is generally considered a safe fat-loss aid when used appropriately.

Contraindications

The compounds in CarbRepel are contraindicated in pregnancy and lactation because of a lack of data for these populations.

Adverse Reactions

Phaseolus vulgaris when used appropriately seems to be safe when used for two to three months[16,17,18]

Citrus Pectin in large doses (20g) can cause gastrointestinal side effects.[19] Pectin has Generally Regarded as Safe (GRAS) status in the United States.[20]

Pomegranate leaf extract is generally well-tolerated.

Upper Limit/Toxicity

There are no established upper limits for the compounds found in CarbRepel.

Summary

Purpose

- The purpose of this product is to reduce caloric intake and absorption in order to accelerate body fat reduction
- A non-stimulant fat loss and appetite aid for those who tend to overeat carbohydrates

Unique Features

- The all natural ingredient Phase 2® is the first nutritional ingredient that has been clinically and scientifically proven to neutralize starch
- The FDA has accepted the following claims based on 14 clinical investigations:
  - "May assist in weight control when used in conjunction with a sensible diet and exercise program"
  - "May reduce the enzymatic digestion of dietary starches"
- Formula and recommendations are proprietary to dotFIT
- Can be used alone or as part of the dotFIT LeanPak90
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Supplement Facts

Serving Size: 2 Tablets — Servings Per Container: 60

Amount Per Serving	% Daily Value*
Phase 2 Starch Neutralizer®‡ White Kidney Bean Extract (Phaseolus vulgaris)	750mg **
Citrus Pectin	375 mg **
Pomegranate Fruit Extract (Total Polyphenols 110 mg, Ellagic Acid 55 mg)	137.5 mg **

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

** % Daily Value not established.

Other Ingredients: Calcium Phosphate, Microcrystalline Cellulose, Hydroxypropylmethylcellulose, Stearic acid (Vegetable source), Magnesium Stearate (Vegetable source), and Silicon Dioxide.

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial Coloring, Flavoring or Preservatives added. Components in this product are derived from natural sources.

‡The trademark Phase 2 Starch Neutralizer® is being used under license.

WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. Do not use if safety seal under cap is broken or missing. Store in a cool dry place. **KEEP OUT OF REACH OF CHILDREN.**

†These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

References

1 Tappenden KA, Martin A, Layman DK, Baum J. Evaluation of the efficacy of an amylase inhibitor. FASEB 2001; 15(4):A301.

2 Vinson JA, Shuta DM. In vivo effectiveness of a starch absorption blocker in a double-blind placebo-controlled study with normal college-age subjects. 2001. Unpublished. http://www.starchstopper.com/study3.html.

3 Vinson JA, Shuta DM, Al Kharrat H. In vivo effectiveness of a starch absorption blocker in a double-blind placebo-controlled study with normal subjects. 2001. unpublished. http://www.starchstopper.com/study6.html.

4 Vinson JA, Al Kharrat H. In Vivo Effectiveness of a Starch Absorption Blocker in a Double-Blind Placebo-Controlled Study with Normal Subjects. 2003. unpublished. http://www.starchstopper.com/study_vivoeffect.html.

5 Vinson JA. Investigation of the efficacy of Phase 2® , a purified bean extract from Pharmachem Laboratories. 2001. unpublished. http://www.starchstopper.com/study1.html

6 Anonymous. Starch Neutralizer Promotes Weight Loss, Lowers Triglyceride Levels. http://www.starchstopper.com/study_dec1002.html

7 Thom E. A randomized, double-blind, placebo-controlled trial of a new weight-reducing agent of natural origin. J Int Med Res 2000; 28:229-33.

8 Barclay AW, Petocz P, McMillan-Price J, Flood VM, Prvan T, Mitchell P, Brand-Miller JC. Glycemic index, glycemic load, and chronic disease risk--a meta-analysis of observational studies. Am J Clin Nutr. 2008 Mar;87(3):627-37. Review.

9 Brand-Miller J, Hayne S, Petocz P, Colagiuri S. Low-glycemic index diets in the management of diabetes: a meta-analysis of randomized controlled trials. Diabetes Care. 2003 Aug;26(8):2261-7.

10 Roberts SB. Glycemic index and satiety. Nutr Clin Care. 2003 Jan-Apr;6(1):20-6. Review.

11 Udani JK, Singh BB, Barrett ML, Preuss HG. Lowering the glycemic index of white bread using a white bean extract. Nutr J. 2009 Oct 28;8:52.

12 Anonymous. Pectin delays gastric emptying. Nutrition reviews 1989; 47(9):268-70.

13 Di Lorenzo C, Williams C M, Hajnal F, Valenzuela J E. Pectin delays gastric emptying and increases satiety in obese subjects. Gastroenterology 1988; 95(5):1211-5.

14 Tiwary CM, Ward JA, Jackson BA. Effect of pectin on satiety in healthy US Army adults. Journal of the American College of Nutrition 1997; 16(5):423-8.

15 Lei F, Zhang XN, Wang W, Xing DM, Xie WD, Su H, Du LJ. Evidence of anti-obesity effects of the pomegranate leaf extract in high-fat diet induced obese mice. Int J Obes (Lond). 2007 Jun;31(6):1023-9. Epub 2007 Feb 13.

16 Birketvedt GS, Travis A, Langbakk B, Florholmen JR. Dietary supplementation with bean extract improves lipid profile in overweight and obese subjects. Nutrition 2002;18:729-33.

17 Udani J, Hardy M, Madsen DC. Blocking carbohydrate absorption and weight loss: A clinical trial using phase 2 brand proprietary fractionated white bean extract. Altern Med Rev 2004;9:63-9.

18 Celleno L, Tolaini MV, D'Amore A, et al. A dietary supplement containing standardized Phaseolus vulgaris extract influences body composition of overweight men and women. Int J Med Sci 2007;4:45-52.
19 Knopp RH, Superko HR, Davidson M, et al. Long-term blood cholesterol-lowering effects of a dietary fiber supplement. Am J Prev Med 1999;17:18-23.
20 FDA. Center for Food Safety and Applied Nutrition, Office of Premarket Approval, EAFUS: A food additive database. Available at: vm.cfsan.fda.gov/~dms/eafus.html.

ThermAccel®

ThermAccel is formulated to deliver a "better stimulant effect" when compared to competitors and increase thermogenesis (wasting calories as heat) by combining a new energy complex with caffeine and caffeine-containing herbs. ThermAccel also addresses appetite control by incorporating two powerful natural ingredients, Caralluma fimbriata and Lepticore™, that work through unique body fat regulation pathways. ThermAccel works through different and complimentary weight regulation mechanisms than FatRelease® and CarbRepel®, making it ideal for cycling or use by itself, especially for people needing appetite control who do well with a stimulant approach to a body fat/weight reduction program.

Rationale

New thermogenic complex (Caffeine, Yerba Mate, Guarana seeds, Green tea leaf extract and Cayenne fruit) are uniquely combined to increase the user's total daily calorie burn by increasing thermogenesis (increasing metabolism through wasting calories/fat as heat) and by stimulating a desire to increase physical activity through enhanced alertness and stimulation of the central nervous system. Caffeine and caffeine-containing herbs have also demonstrated a positive effect on appetite suppression and fat oxidation.[1,2,3,4] Taken together, these functional ingredients have the potential to produce significant effects on metabolic targets such as satiety, thermogenesis and fat oxidation.[5]

Caffeine has been shown to increase energy expenditure (EE) approximately 3-5% in the first 2.5 hours after ingestion.[4,6] Comparable increases in EE have been shown with Epigallocatechin gallate (EGCG) in human subjects.[7] Combining caffeine and EGCG together may have a synergistic effect on 24 hour EE.[5,8] Respiratory quotient is lower in subjects who consume EGCG which indicates greater fat oxidation. According to Dulloo et al, fat oxidation accounted for approximately 42% of the total calories burned over the course of 24 hours in the EGCG group compared to the placebo (32%) and caffeine (34%) groups.[7] (See Figure 3 and 4.)

Epigallocatechin gallate (EGCG) from Green tea has demonstrated antioxidant properties, a potential to destroy fat cells,[9] increase overall energy expenditure[10,11] (especially in the presence of caffeine) and has shown positive effects on fat oxidation.[2,5,6,12,13,14,15,16]

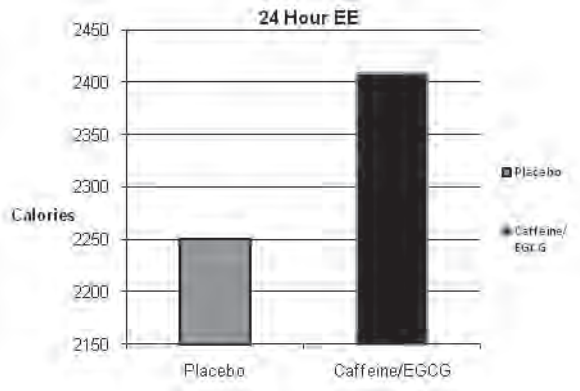

Figure 3: Studies show at least a 10% increase in 24 hour EE or equivalent to 157 more calories burned in the caffeine/EGCG group (Average subject's weight 173 lbs).

Capsaicin from Cayenne fruit can stimulate sympathetic nervous system (SNS) activity, promote the secretion of catecholamine (epinephrine and norepinephrine, which increases metabolic rate[17] and temperature[18]), and has been shown to increase the expression of the uncoupling protein[19,20] (UCP) in many tissues leading to an increase in wasting calories as heat. A recent study confirmed previous findings that ingestion of 10 mg of capsinoids increased adrenergic activity, energy expenditure, and resulted in a shift in substrate utilization toward lipid, thus demonstrating the thermogenic and metabolic effects of capsinoids and further highlights its potential role as an adjunct weight loss aid, in addition to diet and exercise.[21]

dotFIT's proprietary complex includes *__Lepticore__™, which is a new, safe and natural complex of plant-based polysaccharides and esterified fatty acids that has demonstrated ability to reduce stored body fat [22,23,24,25,26,27,28,29,30,31] and enhance weight loss in recent scientific findings.[24,27,28,30] Proposed mechanisms are the complex's ability to interact with the signaling between the brain, adipose tissue and liver to help control leptin, a hormone that regulates body fat storage. Additionally, the swelling-soluble properties of the complex may have a prolonged satiating effect thus reducing caloric intake. In the study conducted at the University of Connecticut, the supplemented group lost 92% more weight than the placebo[32](See Figure 5.)

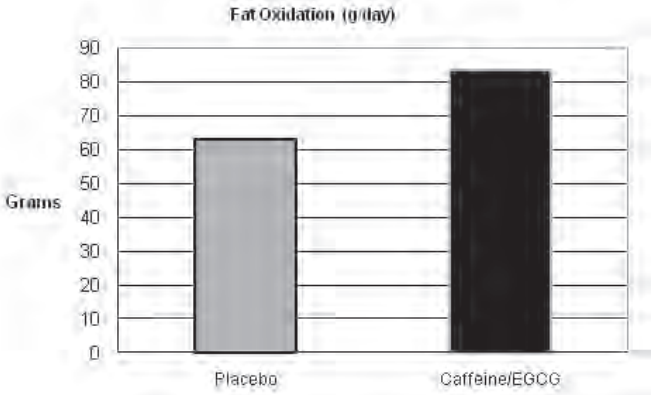

Figure 4: In the same study approximately 20 more grams of fat was oxidized by the supplemented group daily.

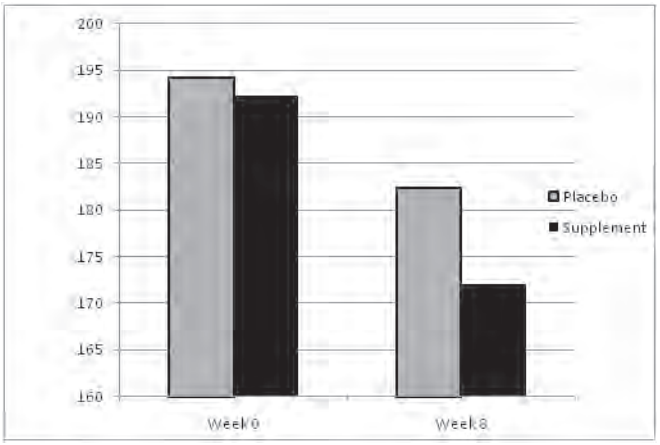

Figure 5: In an eight week period with all things equal, the Loleptin group lost ~8.5 lbs more than the placebo group or 92% more weight.

Caralluma fimbriata (CF) is a natural extract from an edible succulent cactus that has a long and safe history of use as an appetite suppressant[33] much like the supplement Hoodia gordonii.[34,35,36,37] Unlike Hoodia, CF has been researched for safety and efficacy, producing positive results. Potential mechanisms of action include the fact that CF contains pregnane glycosides that may suppress appetite by amplifying the signaling of energy sensing functions in the brain (hypothalamus).[38] Additionally, CF may act much like another common appetite suppressant, hydroxycitrate (HCA), by blocking citratelyase. This prevents fat accumulation and redirects extra energy/calories to glycogen stores, which would also improve signals of satiety.

L-Theanine: Theanine is the major amino acid found in green tea.[39] Green tea contains one to three percent theanine.[40,41] It has historically been used for its relaxing and anti-anxiety effects.[41] It may lessen the jitteriness effect common with caffeine-containing supplements.[42,43] L-Theanine is still being tested in combination with caffeine with positive results for improving cognitive skills.[44]

Lepticore™ is a trademark of Pipeline Nutraceuticals, Inc. Protected by US patents 6,899,892,5,569,679 and patents pending.

Typical Use

- For anyone seeking a stimulant with extra appetite control
- For people who need a serious multiple pronged approach to weight control including a strong stimulatory effect to help increase metabolism
- Do not use if taking heart medications
- Do not mix with other stimulants
- Discontinue after reaching body fat reduction goal
- Take 4 tablets daily, 2 at breakfast and 2 with lunch with at least 8-oz of water

Precautions

ThermAccel contains moderate doses of stimulants and should not be used by those seeking to avoid stimulants.

Contraindications

ThermAccel is contraindicated for pregnant and lactating women and those under the age of 18. Caffeine is contraindicated in hypertension, anxiety and thyroid disease. Caffeine can interfere with some medications such as lithium and MAO inhibitors. Caffeine is also contraindicated in those with cardiac arrhythmias, other forms of heart disease and peptic ulcers.

Adverse Reactions

Caffeine use may result in diuresis (increased water loss, usually in non-users) and insomnia when taken late in the day. Numerous studies on the safety of caffeine exist. Caffeine abuse can cause tension, anxiety, excitability and restlessness at doses over 400 mg at one time. Doses over 1000 mg at one time can elicit toxicity symptoms.[45] Because ThermAccel has 130 mg/serving, adverse effects may occur in sensitive individuals. Taking ThermAccel with other stimulants is not advised.

Caralluma fimbriata is safe at the amounts found in ThermAccel.[33]

Upper Limit/Toxicity

None of the compounds in ThermAccel approach toxic levels. Doses of caffeine should not exceed 1000 mg/day.

Summary

Purpose

- ThermAccel is probably the most powerful of the weight loss products based on its stimulatory effect combined with two relatively well-researched new additions that target appetite control and potentially enhance fat cell signaling
- The combination of ingredients in ThermAccel is unique to dotFIT and delivers a multi-tiered attack on body fat

Unique Features

- The proprietary thermogenic blend delivers an enhanced and superior stimulatory effect when compared to other products
- Formula and recommendations are proprietary to dotFIT
- Can be used alone or as part of the LeanPak90®
- The tiered approach is designed to aggressively attack the final desired outcomes
- ThermAccel contains Lepticore™, which has been awarded the patent and claims listed below*
- ThermAccel will deliver all the ingredients by means of a two-stage technology involving microspheres and macrospheres, providing immediate and prolonged activity for the entire day

- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

*Products containing Lepticore™ from Pipeline Nutraceuticals, Inc. have the attached rights of employing the patent number on labels and brochures. At efficacious levels, suggested structure-function or marketing statements may include the following:

- Assists in promoting fat loss (supported by US Patent 6,899,892)
- Assists in promoting a lower percentage of body fat (supported by US Patent 6,899,892)
- Promotes the reduction of stored fat by increasing fatty acid utilization in the fat cell
- Promotes the reduction of fat and an enhanced muscle-to-fat ratio
- Promotes the regulation of energy balance allowing for improved mental energy

Supplement Facts

Serving Size: 2 Tablets — Servings Per Container: 60

Amount Per Serving	% Daily Value*
LumaThin™ Caralluma Powder	520 mg **
dotFIT® Proprietary Lepticore™ Complex‡ (Acacia Polysaccharides, Esterified Fatty Acids, Pomegranate Extract, Aphyanizomenon Flos-Aquae Extract and Beta-Carotene)	310 mg **
L-Theanine	100 mg **
ThermAccel™ Thermogenic Complex Green Tea Extract (providing 270 mg EGCG), Caffeine (providing 350 mg of caffeine), Yerba Mate Powder, Guarana Seed Powder and Cayenne Fruit (standarized for 150,000 Heat Units)	1,000 mg **

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

** % Daily Value not established.

Other Ingredients: Calcium Phosphate, Microcrystalline Cellulose, Hydroxypropylmethylcellulose, Xanthum gum, Stearic acid (Vegetable source), Silicon Dioxide, and Magnesium Stearate (Vegetable source).

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial Coloring, Flavoring or Preservatives added.

‡Lepticore™ is a trademark of Pipeline Nutraceuticals, Inc. Protected by US patents 6,899,892,5,569,679 and patents pending.

WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. This product contains caffeine and should not be taken by those wishing to eliminate caffeine from their diets. Do not exceed recommended daily intake. Improper use of this product will not improve results and is not advised. Do not use if safety seal under cap is broken or missing. Store in a cool dry place. **KEEP OUT OF REACH OF CHILDREN.**

†These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

References

1 Koot P, Deurenberg P. Comparison of changes in energy expenditure and body temperatures after caffeine consumption. Ann Nutr Metab. 1995;39(3):135-42.
2 Diepvens K, Westerterp KR, Westerterp-Plantenga MS. Obesity and thermogenesis related to the consumption of caffeine, ephedrine, capsaicin and green tea. Am J Physiol Regul Integr Comp Physiol. 2006 Jul 13; [Epub ahead of print]
3 Bracco D, Ferrarra JM, Arnaud MJ, Jequier E, Schutz Y. Effects of caffeine on energy metabolism, heart rate, and methylxanthine metabolism in lean and obese women. Am J Physiol. 1995 Oct;269(4 Pt 1):E671-8.
4 Dulloo AG, Geissler CA, Horton T, Collins A, Miller DS. Normal caffeine consumption: influence on thermogenesis and daily energy expenditure in lean and postobese human volunteers. Am J Clin Nutr. 1989 Jan;49(1):44-50.
5 Hursel R, Westerterp-Plantenga MS. Thermogenic ingredients and body weight regulation. Int J Obes (Lond). 2010 Apr;34(4):659-69. Epub 2010 Feb 9. Review.
6 Diepvens K, Westerterp KR, Westerterp-Plantenga MS. Obesity and thermogenesis related to the consumption of caffeine, ephedrine, capsaicin, and green tea. Am J Physiol Regul Integr Comp Physiol. 2007 Jan;292(1):R77-85. Epub 2006 Jul 13. Review.
7 Dulloo AG, Duret C, Rohrer D, Girardier L, Mensi N, Fathi M, Chantre P, Vandermander J. Efficacy of a green tea extract rich in catechin polyphenols and caffeine in increasing 24-h energy expenditure and fat oxidation in humans. Am J Clin Nutr. 1999 Dec;70(6):1040-5.
8 Bérubé-Parent S, Pelletier C, Doré J, Tremblay A. Effects of encapsulated green tea and Guarana extracts containing a mixture of epigallocatechin-3-gallate and caffeine on 24 h energy expenditure and fat oxidation in men. Br J Nutr. 2005 Sep;94(3):432-6.
9 Lin J, Della-Fera MA, Baile CA. Green tea polyphenol epigallocatechin gallate inhibits adipogenesis and induces apoptosis in 3T3- L1 adipocytes. Obes Res. 2005 Jun;13(6):982-90.
10 Murase T, Nagasawa A, Suzuki J, Hase T, Tokimitsu I. Beneficial effects of tea catechins on diet-induced obesity: stimulation of lipid catabolism in the liver. Int J Obes Relat Metab Disord. 2002 Nov;26(11):1459-64.

11 Rains TM, Agarwal S, Maki KC. Antiobesity effects of green tea catechins: a mechanistic review. J Nutr

Biochem. 2010 Nov 5. [Epub ahead of print]
12 Dulloo AG, Seydoux J, Girardier L, Chantre P, Vandermander J. Green tea and thermogenesis: interactions between catechinpolyphenols, caffeine and sympathetic activity. Int J Obes Relat Metab Disord. 2000 Feb;24(2):252-8.
13 Berube-Parent S, Pelletier C, Dore J, Tremblay A. Effects of encapsulated green tea and Guarana extracts containing a mixture of epigallocatechin-3-gallate and caffeine on 24 h energy expenditure and fat oxidation in men. Br J Nutr. 2005 Sep;94(3):432- 6.
14 Nagao T, Meguro S, Soga S, Otsuka A, Tomonobu K, Fumoto S, Chikama A, Mori K, Yuzawa M, Watanabe H, Hase T, Tanaka Y, Tokimitsu I, Shimasaki H, Itakura H. Tea catechins suppress accumulation of body fat in humans. J Oleo Sci 2001; 50: 717 – 728.
15 Dulloo AG, Duret C, Rohrer D, Girardier L, Mensi N, Fathi M, Chantre P, Vandermander J. Efficacy of a green tea extract rich in catechin polyphenols and caffeine in increasing 24-h energy expenditure and fat oxidation in humans. Am J Clin Nutr. 1999 Dec;70(6):1040-5.
16 Zheng G, Sayama K, Okubo T, Juneja LR, Oguni I. Anti-obesity effects of three major components of green tea, catechins, caffeine and theanine, in mice. In Vivo. 2004 Jan-Feb;18(1):55-62.
17 Westerterp-Plantenga M, Diepvens K, Joosen AM, Bérubé-Parent S, Tremblay A. Metabolic effects of spices, teas, and caffeine. Physiol Behav. 2006 Aug 30;89(1):85-91. Epub 2006 Mar 30. Review.
18 Belza A, Jessen AB. Bioactive food stimulants of sympathetic activity: effect on 24-h energy expenditure and fat oxidation. Eur J Clin Nutr. 2005 Jun;59(6):733-41.
19 Masuda Y, Haramizu S, Oki K, Ohnuki K, Watanabe T, Yazawa S, Kawada T, Hashizume S, Fushiki T. Up-regulation of uncoupling proteins by oral administration of capsiate, a nonpungent capsaicin analog. J Appl Physiol. 2003 Dec;95(6):2408- 15. Epub 2003 Sep 5.
20 Snitker S, Fujishima Y, Shen H, Ott S, Pi-Sunyer X, Furuhata Y, Sato H, Takahashi M. Effects of novel capsinoid treatment on fatness and energy metabolism in humans: possible pharmacogenetic implications. Am J Clin Nutr. 2009 Jan;89(1):45-50. Epub 2008 Dec 3.
21 Josse AR, Sherriffs SS, Holwerda AM, Andrews R, Staples AW, Phillips SM. Effects of capsinoid ingestion on energy expenditure and lipid oxidation at rest and during exercise. Nutr Metab (Lond). 2010 Aug 3;7:65.
22 Eikelis N and Esler M. The neurobiology of human obesity. Exp Physiol. 2005; (90)5: 673 – 682.
23 Drevon CA. Fatty acids and expression of adipokines. Bichimica et Biophysica Acta 2005, 1740: 287-292.
24 Meier U, Gressner AM. Endocrine regulation of energy metabolism: Review of pathobiochemical and clinical chemical aspects of leptin, ghrelin, adiponectin and resistin. Clin Chemistry 2004, 50(9): 1511-1525.
25 Cohen P, Miyazaki M, Socci ND, Hagge-Greenberg A, Liedtke W, Soukas AA, Sharma R, Hudgins LC, Ntambi JM, Friedman JM. Role for stearoyl-CoA desaturase-1 in leptin-mediated weight loss. Science. 2002 12; 297(5579):240-3.
26 Cohen P, Friedman JM. Leptin and the control of metabolism: role for stearoyl-CoA desaturase-1 (SCD-1). J Nutr. 2004 Sep; 134(9):2455S-2463S.
27 Eikelis N and Esler M. The neurobiology of human obesity. Exp Physiol. 2005; (90)5: 673 – 682.
28 Drevon CA. Fatty acids and expression of adipokines. Bichimica et Biophysica Acta 2005, 1740: 287-292.
29 Meier U, Gressner AM. Endocrine regulation of energy metabolism: Review of pathobiochemical and clinical chemical aspects of leptin, ghrelin, adiponectin and resistin. Clin Chemistry 2004, 50(9): 1511-1525.
30 US Patent 6,899,892
31 Cohen P, Miyazaki M, Socci ND, Hagge-Greenberg A, Liedtke W, Soukas AA, Sharma R, Hudgins LC, Ntambi JM, Friedman JM. Role for stearoyl-CoA desaturase-1 in leptin-mediated weight loss. Science. 2002 12; 297(5579):240-3.
32 Kraemer WJ, Volek JS, Fragala MS, et al. Influences of a dietary supplement in combination with an exercise and diet regimen, on adipocytokines and adiposity in Women who are Overweight. Human Performance Laboratory, Department of Kinesiology, University of Connecticut; 2007.
33 Kuriyan R, Raj T, Srinivas SK, Vaz M, Rajendran R, Kurpad AV. ct of Caralluma fimbriata extract on appetite, food intake and anthropometry in adult Indian men and women. Appetite. 2007 May;48(3):338-44. Epub 2006 Nov 13.
34 Wealth of India. A Dictionary of Indian Raw Materials and Industrial Products 3:266-267, 1992.
35 http://www.botany.com/caralluma.html

36 Report of KS Laddha, Medicinal Natural Products Research Laboratory, University of Mumbai, Matunga, Mumbai, India.
37 http://www.hort.purdue.edu/newcrop/FamineFoods/ff_families/ASCLEPIADACEAE.Html.
38 Lawrence RM, Choudhary S. Slimaluma - Caralluma Fimbriata Extract: A Clinically Proven Herbal Alter-

native in the Management of Obesity. Ronald M. Lawrence, M.D., Malibu, California.
39 Haskell CF, Kennedy DO, Milne AL, Wesnes KA, Scholey AB. The effects of L-theanine, caffeine and their combination on cognition and mood. Biol Psychol. 2008 Feb;77(2):113-22. Epub 2007 Sep 26.
40 Kakuda T, Yanase H, Utsunomiya K, et al. Protective effect of gamma-glutamylethylamide (theanine) on ischemic delayed neuronal death in gerbils. Neurosci Lett 2000;289:189-92.
41 Sadzuka Y, Sugiyama T, Sonobe T. Efficacies of tea components on doxorubicin induced antitumor activity and reversal of multidrug resistance. Toxicol Lett 2000;114:155-62.
42 Bryan J. Psychological effects of dietary components of tea: caffeine and L-theanine. Nutr Rev. 2008 Feb;66(2):82-90. Review.
43 Rogers PJ, Smith JE, Heatherley SV, Pleydell-Pearce CW. Time for tea: mood, blood pressure and cognitive performance effects of caffeine and theanine administered alone and together. Psychopharmacology (Berl). 2008 Jan;195(4):569-77. Epub 2007 Sep 23.
44 Einöther SJ, Martens VE, Rycroft JA, De Bruin EA. L-theanine and caffeine improve task switching but not intersensory attention or subjective alertness. Appetite. 2010 Apr;54(2):406-9. Epub 2010 Jan 15.
45 Hardman JG, Limvird LE, Molinoff PB, Ruddon RW, Goodman Gilman A, editors. Goodman & Gilman's The pharmacological basis of therapeutics. 9th Ed. New York: McGraw-Hill; 1996. p 1274, 1275, 1426; 1903p.

LeanMR™ Balanced Nutrition Shake

Goal

The purpose of the LeanMR formula is to support body fat/weight reduction by delivering better, satisfying nutrition in fewer calories.

LeanMR was designed to provide maximum support for lean body mass (LBM), a steady supply of energy, and optimal fullness (satiety) within the least amount of calories in order to improve the dieting experience and accelerate results.

With only 180-190 calories per serving, LeanMR provides

- 20 grams of the highest-quality protein, whey protein isolate to support the preservation or increase of LBM while decreasing body fat
- The perfect dose and blend of necessary fats including Conjugated Linoleic Acid (Tonalin®) to support the special needs and appetites of active individuals during dieting
- 19.5 grams of a Sustained Release Patented Carbohydrate Blend with 6-7 grams of fiber (Fibersol-2® and Glucomannan) and no sugar to deliver immediate and long-lasting energy and fullness

Rationale

LeanMR Drink Mix for Weight Control

In all studies meal replacements (MR) have been shown to be an extremely effective aid to weight reduction[1,2,3,4] and in almost all cases more effective than conventional methods of dietary restrictions.[5,6,7,8] (see Figure 6.) Additionally MR have been shown to be just as effective as dietary restriction combined with pharmacological therapy.[9]

And most importantly, continuous use of MR may be the most effective means of all treatments when it comes to maintaining weight loss.[1,10,11,12] (See Figure 7.)

MRs are generally used to replace one or two meals a day and allow freedom of choice for the remaining allotted foods/calories.

Meal replacements allow

- Portion control: people generally attempt to consume meals to completion,[13,14] therefore meal portion size significantly impacts a person's total calorie intake.[13,15] Overwhelming evidence validates that the smaller the portions, the fewer daily calories consumed[15] and vice-versa. In other words, people tend to "eat with their eyes not their stomachs". Use of portion-controlled meals has proven to yield greater weight loss than conventional diet therapy alone.[16,17,18,19]
- Accurate calorie counts of total daily food intake when compared to having to estimate the calories of self-prepared or unmarked meals.[20]
- Satiety (fullness): use of a properly formulated MR such as the LeanMR mix allows the user to increase the frequency of daily meals while managing calories. This in turn satisfies appetite and maintains greater daily energy levels i.e. more nutrition and fullness with fewer calories, and often a significant savings in groceries. Proper use throughout the day can deliver good nutrition while helping to save calories, allowing the user to partake in larger meals or favorite foods at desired times (e.g. higher calorie lunches and/or dinners).
- Higher protein-to-calorie ratio: helps protect lean body mass while dieting, which is otherwise lost when consuming only a restricted conventional diet.[2,3]

Sustained-Release Carbohydrate with Fibersol® Blend

The combination of Rice Oligodextrins (low glycemic carbohydrate source), Palatinose™ (generic name Isomaltulose), Glucomannan (a soluble fiber) and Fibersol-2™ (functional soluble fiber) allow for users of the LeanMR mix to experience even and prolonged energy levels and greater satiety.

Palatinose™ is a low glycemic functional carbohydrate that delivers prolonged energy due to its unique structure and low insulinemic response. With its slow but complete absorption, Palatinose provides constant and extended streams of energy for muscles and brain. This new energy source lasts over a longer period of time when compared to quickly absorbed carbohydrates.[21]

Fibersol-2™ is a soluble fiber and is included in this formula to deliver dietary fiber's well known positive impact on health and weight control/appetite. Fiber is extremely important in a weight control program because it produces the feeling of fullness sooner and longer when added to a meal.[23] Fibersol-2, a digestive resistant maltodextrin, is a soluble fiber that doesn't act like one. Fibersol-2 doesn't affect taste or interfere with mineral or calcium absorption, traits that are common among other fibers. Because Fibersol-2 is fermented slowly; it produces less acid and gas than most soluble fibers. All these traits make Fibersol-2 the perfect fiber to add to the diet and therefore are included in the LeanMR mix. The user receives the benefits of a "better fiber" in a convenient delivery system without fiber's sometimes less desirable effects (taste, gas, bloating, etc.). Studies have shown Fibersol-2 to improve bowel regularity,[24] exert a positive effect on blood glucose,[25] lower cholesterol and serum triglycerides,[25] increase probiotic levels (feed good bacteria) and help keep the digestive tract clean and healthy.[26] Additionally Fibersol-2 has been approved as GRAS (generally regarded as safe) status by the Food and Drug Administration (FDA).

Glucomannan is a soluble fiber added to Lean Mix because it has been clinically shown to beneficially affect total cholesterol, LDL cholesterol, body weight and fasting blood glucose.[27] Glucomannan continues to be used within fiber mixtures successfully in clinical trials related to improved weight loss, satiety and decreases in LDL-cholesterol.[28,29,30]

Healthy Dietary Fat Blend

The LeanMR mix includes a combination of important fats for added satiety and health maintenance including Conjugated Linoleic Acid (CLA) supplied by Tonalin®.[31] CLA has demonstrated numerous potential health benefits and regular dosages have been shown to exert modest but positive effects on body composition.[32]

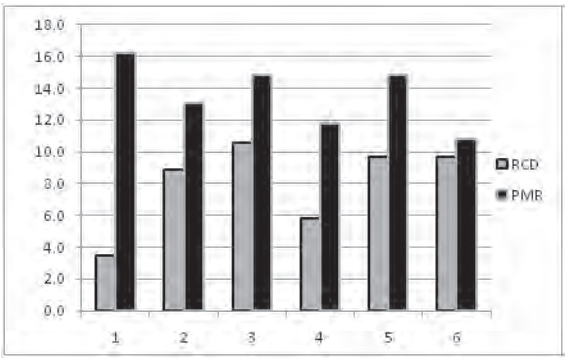

Figure 6: In all six studies the groups that were using meal replacements (PMR) as part of their overall calorie intake lost significantly more weight than the reduced calorie diet (RCD) group.[1]

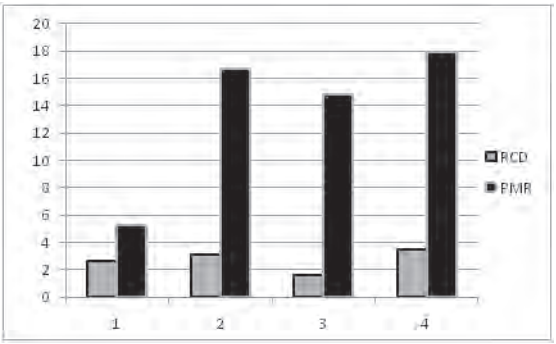

Figure 7: In a 1-year follow-up in the groups that were tracked, the subjects still using meal replacements maintained significantly more weight loss than the RCD group.[1]

Summary

Purpose

The LeanMR™ mix is to be used primarily as a satisfying and healthy meal replacement that supports body fat/weight loss goals to a better extent than competitive products. It delivers high satiety and nutrition in fewer calories:

- A healthy, convenient food replacement designed to be integrated into daily meal planning in order to assist the user in reaching and maintaining weight control and health goals
- Supply nutrient-rich, convenient snacks between meals to boost energy, curb hunger and assist in weight control by controlling calories
- Also can be used for "snacking", which may decrease the amount of food consumed in the subsequent meal or keep one from making an inappropriate food choice (e.g. high-calorie meal driven by an uncontrolled craving) as often happens when extra hungry and especially during weight loss

Unique Features

- Contains the highest quality whey protein – high protein product
- Proprietary blend of carbohydrates, including functional fibers, deliver a "better lasting" energy and satiety to support aggressive weight loss goals
- Contains NO ASPARTAME, no sugar and relatively LOW sodium
- Six to seven grams of fiber (24 to 28% of daily needs) for satiety and health (including helping to maintain the integrity of the digestive track and bowel regularity)
- Healthy blend of essential fats including CLA
- Designed in a synergistic relationship with all dotFIT products and a person's traditional food intake. It is NOT spiked with unnecessary nutrients. Most other products in this space (e.g. bars, shakes, etc.) are heavily spiked with many nutrients, leading to undesirable levels within the body when combining multiple manufacturers, products and normal food intake
- When consuming only dotFIT products as directed with one's normal daily food intake, the recipient is assured of keeping the body at a safe and optimal nutrient level
- Formulated and manufactured for great taste and pleasing texture in a FDA-registered facility in compliance with Good Manufacturing Practices (GMPs) and maintains rigorous product testing, exclusively for dotFIT, LLC

Nutrition Facts

Serving Size: 2 Scoops (51 g)
Servings Per Container: About 20
Calories 190
Fat Cal. 15

Amount Per Serving		% Daily Value*
Total Fat	**2 g**	**3%**
Saturated Fat	.5 g	3%
Trans Fat	0 g	**
Cholesterol	**10 mg**	**3%**
Sodium	**180 mg**	**8%**
Total Carbohydrate	**24 g**	**8%**
Dietary Fiber	7 g	28%
Sugars	0 g	**
Protein	**20 g**	**40%**
Vitamin A (as Beta Carotene)	500 IU	10%
Vitamin C (as Ascorbic acid)	6 mg	10%
Calcium (from Calcium Lactate Gluconate)	200 mg	20%
Iron (as Ferrous Sulfate)	1.8 mg	10%
Vitamin D (as Cholecalciferol)	40 IU	10%
Vitamin E (as Succinate)	3 IU	10%
Thiamine (as Thiamin Hydrochloride)	.15 mg	10%
Riboflavin	.17 mg	10%
Niacin (as Niacinamide)	2 mg	10%
Vitamin B6 (as Pyridoxine Hydrochloride)	.2 mg	10%
Vitamin B12 (as Cyanocobalamin)	.6 mcg	10%
Biotin	30 mcg	10%
Pantothenic acid (as D-Calcium Pantothenate)	1 mg	10%
Iodine (as Potassium Iodide)	15 mcg	10%
Magnesium (as Magnesium Phosphate)	40 mg	10%
Zinc (as Zinc Sulfate)	1.5 mg	10%
Copper (as Copper Gluconate)	.2 mcg	10%
Sustained Release Carbohydrates Blend Rice Oligodextrins, Digestion Resistant Maltodextrin (Fibersol-2), Isomaltulose, Glucomannan	21.5 g	**
Lean Fats Blend Flaxseed Powder, High Oleic Sunflower Oil, Conjugated Linoleic Acid	2.5 g	**

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Whey Protein Isolate, Lean Carb Blend (Rice Oligodextrins, Fibersol-2, Isomaltulose), Dutch Process Cocoa, Fat Blend (Flaxseed powder, High Oleic Sunflower oil, Conjugated Linoleic acid, Glucomannan, Vitamin and Mineral Blend (Calcium Lactate Gluconate, Magnesium Phosphate, Ascorbic acid, Vitamin E Succinate, Niacinamide, Ferrous Sulfate, Zinc Sulfate, Pantothenic acid, Beta Carotene, Pyridoxine HCl, Copper Gluconate, Riboflavin, Thiamin HCl, Biotin, Potassium Iodide, Cyanocobalamin, Vitamin D [Cholecalciferol]), Natural and Artificial Flavors, Carboxymethylcellulose gum, Salt, Sucralose, Acesulfame Potassium.

Contains: Derived from Milk.

	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Saturated Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Potassium	3,500mg	3,500mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g
Calories per gram:	Fat 9 • Carbohydrate 4 • Protein 4	

References

1 Heymsfield SB, van Mierlo CA, van der Knaap HC, Heo M, Frier HI. Weight management using a meal replacement strategy: meta and pooling analysis from six studies. Int J Obes Relat Metab Disord. 2003 May;27(5):537-49.
2 Smith TJ, Sigrist LD, Bathalon GP, McGraw S, Karl JP, Young AJ. Efficacy of a meal-replacement program for promoting blood lipid changes and weight and body fat loss in US Army soldiers. J Am Diet Assoc. 2010 Feb;110(2):268-73.
3 Flechtner-Mors M, Boehm BO, Wittmann R, Thoma U, Ditschuneit HH. Enhanced weight loss with protein-enriched meal replacements in subjects with the metabolic syndrome. Diabetes Metab Res Rev. 2010 Jul;26(5):393-405.
4 Hamdy O, Zwiefelhofer D. Weight management using a meal replacement strategy in type 2 diabetes. Curr Diab Rep. 2010 Apr;10(2):159-64. Review.
5 Ashley JM, St Jeor ST, Perumean-Chaney S, Schrage J, Bovee V. Meal replacements in weight intervention. Obes Res. 2001 Nov;9 Suppl 4:312S-320S.
6 Ditschuneit HH. Do meal replacement drinks have a role in diabetes management? Nestle Nutr Workshop Ser Clin Perform Programme. 2006;11:171-9; discussion 179-81. Review.
7 Li Z, Hong K, Saltsman P, DeShields S, Bellman M, Thames G, Liu Y, Wang HJ, Elashoff R, Heber D. Long-term efficacy of soy based meal replacements vs an individualized diet plan in obese type II DM patients: relative effects on weight loss, metabolic parameters, and C-reactive protein. Eur J Clin Nutr. 2005 Mar;59(3):411-8.
8 Poston WS, Haddock CK, Pinkston MM, Pace P, Karakoc ND, Reeves RS, Foreyt JP. Weight loss with meal replacement and meal replacement plus snacks: a randomized trial. Int J Obes (Lond). 2005 Sep;29(9):1107-14.
9 Douketis JD, Macie C, Thabane L, Williamson DF. Systematic review of long-term weight loss studies in obese adults: clinical significance and applicability to clinical practice. Int J Obes (Lond). 2005 Oct;29(10):1153-67. Review.
10 Ditschuneit HH, Flechtner-Mors M. Value of structured meals for weight management: risk factors and long-term weight maintenance. Obes Res. 2001 Nov;9 Suppl 4:284S-289S.
11 Rothacker DQ. Five-year self-management of weight using meal replacements: comparison with matched controls in rural Wisconsin. Nutrition 2000;16:344–8.
12 Flechtner-Mors M, Ditschuneit HH, Johnson TD, Suchard MA, Adler G. Metabolic and weight loss effects of long-term dietary intervention in obese patients: four-year results. Obes Res. 2000 Aug;8(5):399-402.
13 Levitsky DA, Youn T. The more food young adults are served, the more they overeat. J Nutr. 2004 Oct;134(10):2546-9.
14 Wansink B, Painter JE, North J. Bottomless bowls: why visual cues of portion size may influence intake. Obes Res. 2005 Jan;13(1):93-100.
15 Rolls BJ, Roe LS, Meengs JS. Reductions in portion size and energy density of foods are additive and lead to sustained decreases in energy intake. Am J Clin Nutr. 2006 Jan;83(1):11-7.
16 Jeffery RW, Wing RR, Thorson C, Burton LR, Raether C, Harvey J, Mullen M. Strengthening behavioral interventions for weight loss: a randomized trial of food provision and monetary incentives. J Consult Clin Psychol. 1993 Dec;61(6):1038-45
17 McCarron DA, Oparil S, Chait A, Haynes RB, Kris-Etherton P, Stern JS, Resnick LM, Clark S, Morris CD, Hatton DC, Metz JA, McMahon M, Holcomb S, Snyder GW, Pi-Sunyer FX. Nutritional management of cardiovascular risk factors. A randomized clinical trial. Arch Intern Med. 1997 Jan 27;157(2):169-77.
18 Wing RR, Jeffery RW. Food provision as a strategy to promote weight loss. Obes Res. 2001 Nov;9 Suppl 4:271S-275S. Review.
19 Wing RR, Jeffery RW, Burton LR, Thorson C, Nissinoff KS, Baxter JE. Food provision vs structured meal plans in the behavioral treatment of obesity. Int J Obes Relat Metab Disord. 1996 Jan;20(1):56-62.
20 Abbot JM, Thomson CA, Ranger-Moore J, Teixeira PJ, Lohman TG, Taren DL, Cussler E, Going SB, Houtkooper LB. Psychosocial and behavioral profile and predictors of self-reported energy underreporting in obese middle-aged women. J Am Diet Assoc. 2008 Jan;108(1):114-9.
21 "PALATINOSE™ - The New Carbohydrate from BENEO-Palatinit." Beneo Palatinit. 2008. Beneo Palatinit. 6 Nov. 2008 < http://www.beneo-palatinit.com/en/Food_Ingredients/Palatinose/What_is_PALATINOSE__/>.

22 Liu S, Willett WC, Manson JE, Hu FB, Rosner B, Colditz G. Relation between changes in intakes of dietary fiber and grain products and changes in weight and development of obesity among middle-aged women. Am J Clin Nutr. 2003 Nov;78(5):920-7.
23 Slavin JL. Position of the American Dietetic Association: health implications of dietary fiber. J Am Diet Assoc. 2008 Oct;108(10):1716-31.
24 Satouchi M et al, "Effects of indigestible dextrin on bowel movements," Japanese J Nutr, 51:31-37, 1993.
25 Tokunaga K and Matsuoka A, "Effects of a [FOSHU] which contains indigestible dextrin as an effective ingredient on glucose and lipid metabolism," J Japanese Diabetes Society, 42:61-65, 1999.
26 Fastinger ND, Karr-Lilienthal LK, Spears JK, Swanson KS, Zinn KE, Nava GM, Ohkuma K, Kanahori S, Gordon DT, Fahey GC Jr. A novel resistant maltodextrin alters gastrointestinal tolerance factors, fecal characteristics, and fecal microbiota in healthy adult humans. J Am Coll Nutr. 2008 Apr;27(2):356-66.
27 Sood N, Baker WL, Coleman CI. Effect of glucomannan on plasma lipid and glucose concentrations, body weight, and blood
pressure: systematic review and meta-analysis. Am J Clin Nutr. 2008 Oct;88(4):1167-75. Review.
28 Salas-Salvadó J, Farrés X, Luque X, Narejos S, Borrell M, Basora J, Anguera A, Torres F, Bulló M, Balanza R; Fiber in Obesity-Study Group. Effect of two doses of a mixture of soluble fibres on body weight and metabolic variables in overweight or obese patients: a randomised trial. Br J Nutr. 2008 Jun;99(6):1380-7. Epub 2007 Nov 22.
29 Rogovik AL, Chanoine JP, Goldman RD. Pharmacotherapy and weight-loss supplements for treatment of paediatric obesity. Drugs. 2010 Feb 12;70(3):335-46. doi: 10.2165/11319210-000000000-00000. Review.
30 Lyon MR, Reichert RG. The effect of a novel viscous polysaccharide along with lifestyle changes on short-term weight loss and associated risk factors in overweight and obese adults: an observational retrospective clinical program analysis. Altern Med Rev. 2010 Apr;15(1):68-75.
31 "CLA Research." The Healthy Edge Your Body Needs. 2008. Tonalin. 6 Nov. 2008 <http://www.tonalin.com/content/view/23/38/1/0/lang,english/>.
32 Bhattacharya A, Banu J, Rahman M, Causey J, Fernandes G. Biological effects of conjugated linoleic acids in health and disease. J Nutr Biochem. 2006 Dec;17(12):789-810. Epub 2006 May 2. Review.

performance dotFIT™

The goal of products in this category is to deliver safe, known, performance-enhancing substances not practically available from food sources that can improve training-induced size or performance outcomes. For complete position statement see page 3, and nutrition dotFIT for other goal enhancing formulas. Also see Appendix 3: Xtreme Muscle Stack: Creating the Perfect Anabolic Storm.

CreatineMonohydrate

Goal

Creatine, a natural substance found in the muscle, is now a proven, safe[1] and powerful size and performance-enhancing dietary supplement. The goal of supplementing creatine is to increase the muscle levels of creatine and speed the regeneration of creatine phosphate beyond what can practically be accomplished by diet alone. Maximizing muscle stores of creatine through supplementation has been shown in hundreds of clinical trials to improve anaerobic performance,[2,3,4,5,6,7,8,9,10,11,12,13,14,15,16] power, strength,[5,12,14,15,16,17] and enhance muscle size and/or body composition[5,8,14,17,18,19,20,21,22,23,24] when compared to placebo.

dotFIT CreatineMonohydrate is designed to match the exact compound and dosage used in successful clinical trials that have demonstrated size and performance enhancement. The dotFIT capsule form of creatine allows the user the freedom to conveniently and accurately control delivery and dosage throughout the day. Additionally, because of its single ingredient, capsule form and size, CreatineMonohydrate is ideal for increasing total creatine intake to desired levels when using other creatine products that contain mixed ingredients with limited dosage recommendations.

Rationale

Creatine (Cr) is a substance found in skeletal, cardiac, and smooth muscle. Creatine synthesis occurs in the liver, kidneys, and pancreas from the amino acids methionine, glycine, and arginine.[25] Most of the total body creatine resides in skeletal muscle where about one-third exists as creatine (Cr) and two-thirds as phosphocreatine (PCr). Typically, the human body manufactures about one gram of creatine, obtains one gram from food, and loses about two grams per day. Therefore, under normal circumstances, creatine levels are fairly constant.[26] The average concentration of total Cr in skeletal muscle varies between 100 and 150 mmol/kg dry weight in normal humans. Cr and PCr are degraded to creatinine in a non-enzymatic, irreversible reaction. Creatinine is then filtered by the kidneys into the urine, the primary route of loss. The primary food sources of Cr are animal muscle meats.

Creatine enters a number of cell types by a sodium-dependent neurotransmitter transporter in the family, which is related to the taurine transporter and the members of the subfamily of GABA/betaine transporters.[27,28,29] Creatine uptake appears to be enhanced by insulin[30,31] and triiodothyronine.[32] Harris found that five grams of CrM, ingested five to six times daily, increased total creatine (TCr) from a mean level of 126 mM/kg dry muscle to 148.6mM/kg, with phosphocreatine representing from 20 to 40% of the increase.[33] Hultman et al later found a more gradual increase in TCr by ingesting three grams per day for 28 days. In both methods, TCr levels increased by approximately 20%.[34]

Role of Creatine in muscle

Creatine plays a pivotal role in muscle ergogenics by acting as part of an energy-buffering system.[35] When phosphorylated by the enzyme creatine phosphokinase (CK), the resulting product, PCr, can donate the inorganic phosphate to adenosine diphosphate (ADP), making adenosine triphosphate (ATP) and thus supporting muscle contraction.

During periods of muscle contraction when ATP breakdown exceeds synthesis, PCr rapidly replenishes ATP. PCr supplies the required energy to fuel 10 to 15 high-intensity contractions such as in weight lifting. The availability of PCr in skeletal muscle has often been cited as limiting to the continuation of maximal physical effort. To be sure, the depletion of muscle PCr stores during intense exercise is associated with

the onset of muscle fatigue.[36] Utilization of PCr will also contribute to buffering of lactic acid, assisting in continuation of maximal exercise.

Creatine supplementation and performance

The onset of fatigue during high-intensity exercise may be linked to PCr depletion, pH alterations, or lactate accumulation. Supplemental creatine may play a role in ameliorating all of these factors as shown in Figure 1 below.

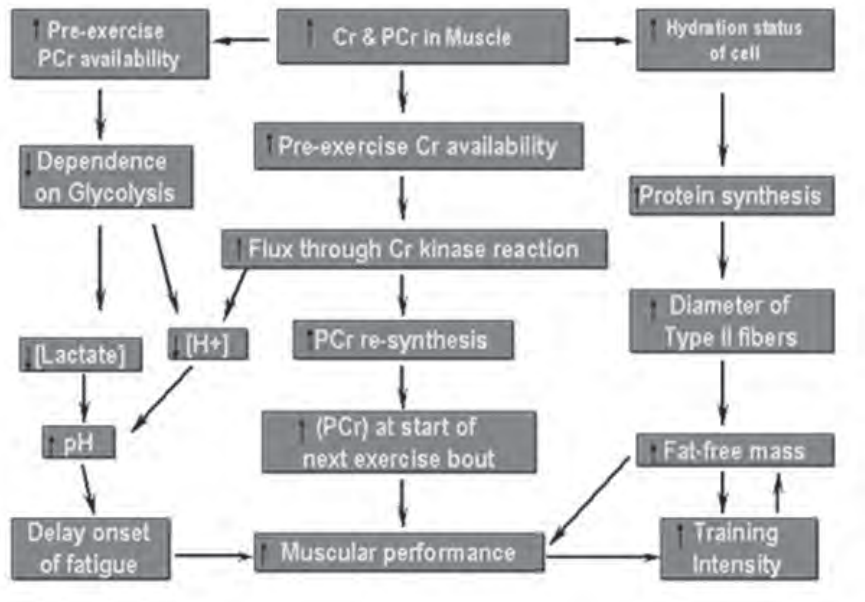

Figure 1: Impact of creatine on high-intensity exercise (adapted from Volek and Kraemer with permission).

Cr phosphate, with its high-energy phosphoryl transfer potential, serves to maintain intracellular ATP levels.[37] At rest, concentrations of ATP, PCr, and Cr in skeletal muscle are 4, 25, 13 mM, respectively. During exercise, levels of ATP decline very little until the stores of PCr are used.[38] Since creatine supplementation has been shown to increase intracellular levels of PCr, intracellular levels of ATP may be maintained at higher levels for a longer period of time.[39,40] Creatine ingestion has shown a reduction in plasma concentrations of hypoxanthine and lactate following exercise, suggesting lower levels of anaerobic glycolysis and another possible contribution to delaying muscular fatigue by maintaining a normal pH.[41]

The goal of creatine loading is much like the goal of carbohydrate loading by endurance athletes, but instead of increasing glycogen storage, and thus delaying glycogen depletion, loading Cr would enhance PCr levels and delay its depletion. This practice would benefit activities that are dependent on PCr as an energy source such as sprinting and weightlifting.

Creatine supplementation and hypertrophy

Creatine (Cr) supplementation is thought to contribute to hypertrophy (1) by its ability to increase high intensity muscle work capacity,[4,14,17,26,41,42,43,44,45,46,47,48,49,50,51,52] and (2) the resultant stimulation of protein synthesis. If creatine use in healthy athletes enables them to train at a higher level for extended periods (10 to 12 weeks), this should increase protein synthesis.[52] Thus, strength and bodybuilding athletes would have better workouts and greater muscle gain (see Figure 2, Figure 3, and Figure 4). More recently, creatine supplementation has been shown to amplify the increase in satellite cell number and myonuclei concentration in human skeletal muscle fibers during 4–16 wk of resistance training. These creatine-induced adaptations were associated with an enhanced muscle fiber growth in response to strength training.[53] Creatine supplementation has also been shown to favorably alter gene expressions including target genes related to protein synthesis even without exercise acting as the catalyst.[54] These actions

demonstrate the many positive uses of creatine in disease, muscle wasting including age related muscle loss.[55,56,57]

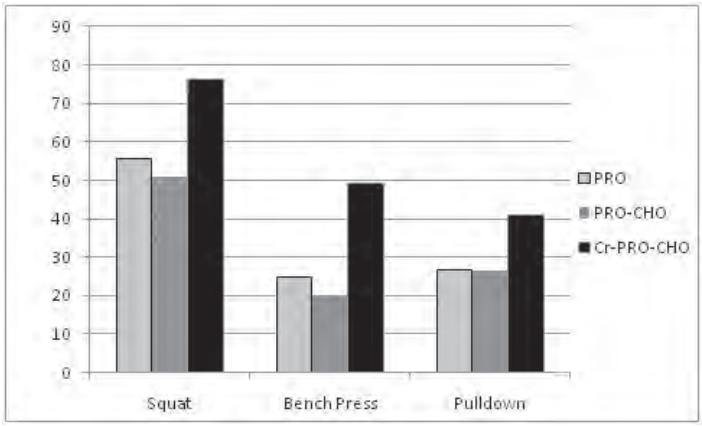

Figure 2: Clearly shows the creatine group out-performing the other groups.[58]

An increase in the synthesis of contractile protein may be responsible for this increase in diameter. As Figure 4 demonstrates, a significantly greater muscle hypertrophy response from the addition of CrM was evident at three different levels of physiology. That is, the CrM-treated group demonstrated greater gains in LBM, hypertrophy of the type IIa and IIx fibers, and increase in contractile protein. Cr is theorized to be the chemical signal, coupling increased muscular activity to increased protein synthesis in hypertrophy.[59,60,61,62] As mentioned above, the onset of fatigue during high-intensity exercise may be linked to PCr depletion, pH alterations, or lactate acculmulation, of which supplemental creatine may play a role in ameliorating, as shown in the flowchart.

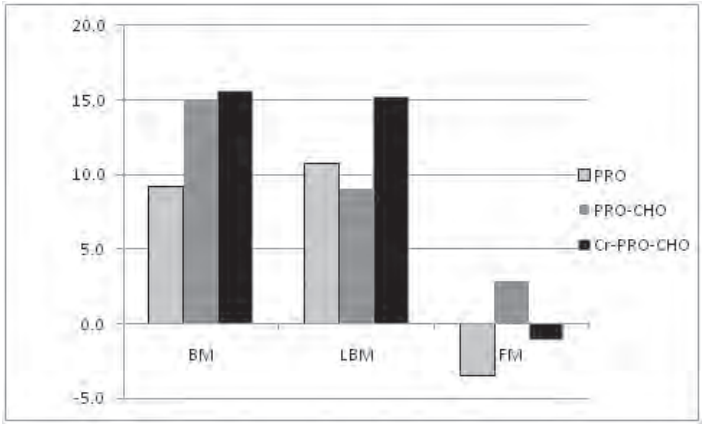

Figure 3: Shows significantly greater increases in lean body mass (LBM) in the CrM group.[58]

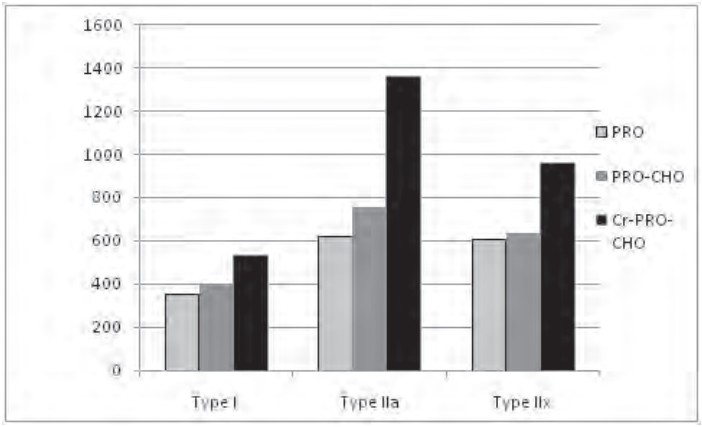

Figure 4: Demonstrates CrM significantly increased muscle hypertrophy in all three muscle fiber types when compared to the other two groups without CrM63.[58]

Therefore, increasing creatine levels may not only increase work capacity, but also the signal to remodel the affected tissue. It has been suggested that Cr acts as a transcriptional or translational factor, or alters the levels of charged tRNAs or amino acid pools specific for muscle protein synthesis.[59,63]

In addition, creatine may act indirectly by increasing the hydration status of the cell. Evidence linking cellular volume and protein synthesis has been emerging.[64,65,67,68] Alterations in cell volume may affect many hormone and amino acid functions by affecting the cell membrane potential or Na+ driven whole body nitrogen balance. Therefore, an increase in intracellular Cr from Cr supplementation may induce cell volumizing. Volumizing over a long period, greater amount of fat-free mass (FFM) may be yielded from resistance training in healthy adults.[23,58,60,61,62,63,64]

Lastly creatine has recently been found to enhance recovery following exercise induced muscle damage. The primary objective of this study was to determine whether consumption of Cr prior to, and following exercise-induced damage, improves force recovery and markers of muscle damage in healthy individuals. Following repeated eccentric exercises, isokinetic knee extension and flexion and isometric knee extension peak torque was significantly reduced, and remained significantly lower than pre-exercise values, for approximately 4 days or longer. Importantly, isometric (21% higher) and isokinetic (10% higher) knee extension strength were both significantly greater during recovery with consumption of a Cr-CHO supplement compared to a supplement with CHO alone.[68] Faster recovery from repeated bouts of exercise will almost certainly lead to greater gains in both size and strength.

Typical Use

- Performance enhancement for experienced anaerobic athletes unconcerned with weight gain
- Experienced exercisers for improving muscle hypertrophy outcomes from resistance training
- Enhancing daily functions in the elderly (confirmed by physician)[10,19,20]
- See Rapid or Gradual Loading Strategy below based on the goal
- People with renal complications should consult a physician before use

Studies involving creatine supplementation beyond ten weeks have shown decreases in muscle creatine stores toward baseline values.[17,23,69] This may be due to an inadequate amount of creatine during the training cycle (most studies used a maintenance dose of five grams a day) and/or the result of creatine transporters down-regulating. One short-term (eight to nine days) human study indicates creatine transporters do not down regulate while one long-term animal study (12 weeks) utilizing extremely high dosages compared to human studies had opposing results.[70]

To ensure muscle creatine stores remain elevated throughout intense training cycles and to prevent the possibility of transport down-regulation, it is recommended that five to ten grams be utilized for up to ten weeks, followed by a two to four week period without supplementation. Body stores of creatine return to baseline within four weeks after supplementation is discontinued.[17,34] Users can repeat the cycle if

appropriate. The loading strategy utilized may depend on training status and need.

Rapid Creatine Loading Strategy

- The supplementation protocol most often described in the scientific literature is referred to as the "loading" protocol. This protocol is described as ingesting approximately 5 grams of CrM four times per day for five to seven days and three to five grams per day thereafter.[71,72] This protocol is most often used in scientific literature to increase muscle creatine stores
- Studies utilizing loading protocols of 20 to 30 grams per day for five to seven days resulted in approximately 50% absorption[69,73,74]
- Performance benefits may occur more rapidly
- May be more beneficial for athletes in a time crunch, and need a boost in performance or strength
- Approximately 25 to 45 grams of carbohydrate (depending on size) should be ingested with each dosage to maximize creatine storage[75,76,77]

Gradual Creatine Loading Strategy

- It has been demonstrated that lower dosages (three grams per day) have shown to gradually (over 28 days) increase creatine stores to the same extent.[69] Long-term studies using low dosages (five to six grams for ten to 12 weeks, no loading phase) resulted in significant increases in strength and muscle size when combined with resistance training[22,78]
- The effect is more gradual; therefore performance benefits do not occur as quickly
- Athletes following a specific training cycle (e.g. muscle hypertrophy) and not in a time crunch can utilize this protocol
- Users can start slowly to maximize absorption and to let their connective tissue and muscle repair keep up with strength increases to avoid injury
- Approximately 25 to 45 grams of carbohydrate (depending on size) should be ingested with each dosage to maximize creatine storage[75,76,77]

Ultimately a user's terminal/maintenance dose will depend on their goal and personal preference. Creatine loading is personal and varies based on a user's physiological state. A minimum of five grams daily may maintain desired levels for many users, and up to 15 grams daily is not uncommon for larger individuals. During non-training days, the amounts should continue to be split throughout the day.

Precautions

Creatine Supplementation in Children and Teens

Pediatricians have stated that creatine supplementation is not safe for children and adolescents.[79] While there is a shortage of investigations that have been conducted using young subjects, no study has shown creatine monohydrate to have adverse effects in children. In fact, long-term CrM supplementation (e.g., four to eight grams per day for up to three years) has been used as an adjunctive therapy for a number of creatine synthesis deficiencies and neuromuscular disorders in children.[80,81] Considering the lack of available data on youth sports performance and CrM supplementation dotFIT does not recommend that children under the age of 18 use creatine monohydrate without proper research and parental consent (For more on creatine and younger athletes, go to www.dotFIT.com/coachneal and click on Supplementation. See 'Creatine Supplementation and Youth'). Young athletes must learn that creatine is not a magic potion or short cut to athletic success and that proper training and dietary strategies to optimize performance must be accomplished first.[83]

Contraindications

Due to one study performed on rats and two human case reports, creatine supplementation is contraindicated for those with kidney problems or at risk for kidney disease because of possible increased kidney stress.[83] However, clinical trials involving creatine supplementation in healthy adults have found serum creatine and creatinine levels (indicators of renal dysfunction) within normal ranges.[83]

Creatine supplementation should be avoided by pregnant or lactating women because of the lack of

studies done with this population. Athletes not desiring weight gain should avoid creatine supplementation or attempt to lose body fat simultaneously in order to offset muscle weight increases thus still receiving creatine's potential performance benefits.

Adverse Reactions

Despite the amount of creatine ingested (i.e. up to 30 grams per day for five years) in clinical research, no adverse reactions (e.g. cramping or increases in core body temperature) have been documented.[7,9,40,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100,101,102,103]

Upper Limit/Toxicity

The upper limit for creatine monohydrate has not been established.[83]

Summary

Purpose

- Performance enhancement for experienced anaerobic athletes unconcerned with potential weight gain
- Especially those with a poor intake (low or no meat intake) or low biosynthesis
- Experienced exercisers for improving muscle hypertrophy outcomes from resistance training
- Enhancing daily functions in the elderly (as confirmed by physician)
- When using other multi-ingredient formulas that contain creatine, it can be a convenient way to increase total daily creatine without increasing intake of the other ingredients

Unique Features

- Contains pure creatine monohydrate, the form shown in over 500 studies to yield results
- Convenient capsule delivery (consistent dose, no mess, no stomach upset)
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Supplement Facts

Serving Size: 3 Capsules — Servings Per Container: 90

Amount Per Serving		% Daily Value*
Creatine (as Creatine Monohydrate)	2,500 mg	**

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Gelatin, Magnesium Stearate, Microcrystalline Cellulose, Titanium Dioxide.

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial coloring, Flavoring or Preservatives added.

WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. Do not use if safety seal under cap is broken or missing. **KEEP OUT OF REACH OF CHILDREN.**

Storage Conditions: Store in a cool, dry place.

†These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

References

1 Dalbo VJ, Roberts MD, Stout JR, Kerksick CM. Putting to rest the myth of creatine supplementation leading to muscle cramps and dehydration. Br J Sports Med. 2008 Jul;42(7):567-73. Epub 2008 Jan 9. Review.
2 Balsom PD, Ekblom B, et al. Creatine supplementation and dynamic high-neuromuscular performance. Eur J Appl Physiol 1985;53:287-293.
3 Birch E, Noble D, Greenhaff PL. The influence of dietary creatine supplementation on performance during repeated bouts of maximal isokinetic cycling in man. Eur J Appl Physiol 1994;69:268-270.
4 Greenhaff PL, Casey A, Short AH, et al. Influence of oral creatine supplementation of muscle torque during maximal short term exercise in man. Clini Sci (Colch) 1993 May;84(5):565-71.
5 Volek JS, Kraemer WJ. Creatine supplementation : its effect on human muscular performance and body composition. J Strength and Cond Res 1996;10(3):200-10.
6 Brannon TA, Adans GR, Conniff CL, Baldwin KM. Effects of creatine loading and training on running performance and biochemical properties of rat skeletal muscle. Am J Physiol 1998 Aug;255(2 Pt 1): E166-172.
7 Cox G, Mujika I, Tumilty D, Burke L. Acute creatine supplementation and performance during a field test simulating match play in elite female soccer players. Int J Sport Nutr Exerc Metab 2002 Mar;12(1):33-46.
8 Van Loon LJ, Oosterlaar AM, Hartgens F, Hesselink MK, Snow RJ, Wagenmakers AJ. Effects of creatine loading and prolonged creatine supplementation on body composition, fuel selection, sprint and endurance performance in humans. Clin Sci (Lond) 2003 Feb;104(2):153-62.
9 Ziegenfuss TN, Rogers M, Lowery L, Mullins N, Mendel R, Antonio J, Lemon P. Effect of creatine loading on anaerobic performance and skeletal muscle volume in NCAA Division I athletes. Nutrition. 2002 May;18(5):397-402.
10 Gotshalk LA, Volek JS, Staron RS, Denegar CR, Hagerman FC, Kraemer WJ. Creatine supplementation improves muscular performance in older men. Med Sci Sports Exerc 2002 Mar;34(3):537-43.
11 Tarnopolsky MA, MacLennan DP. Creatine Monohydrate Supplementation Enhances High-Intensity Exercise Performance in Males and Females. Int J Sport Nutr and Exerc Metabol 2000;10:452-63.
12 Volek JS, Kraemer WJ, Bush JA, Boetes M, Inclendon T, Clark KL, Lynch JM. Creatine supplementation enhances muscular performance during high-intensity resistance exercise. J Am Diet Assoc 1997;97:765-70.
13 Casey A, Constantin-Teodosiu D, Howell S, Hultman E, Greenhaff PL. Creation ingestion favorably affects performance and muscle metabolism during maximal exercise in humans. Am J Physiol 1996;271:E31-7.
14 Earnest DP, Snell PG, Rodriguez R, Almada AL, Mitchell TL. The effect of creatine monohydrate ingestion on anaerobic power indices, muscular strength and body composition. Acta Physiol Scand 1995;153:207-9.
15 Balsom PD, Soderlund K, Sjodin B, Ekblom B. Skeletal muscle metabolism during short duration high-intensity exercise: influence of creatine supplementation. Acta Physiol Scand 1995;154:303-10.
16 Preen D, Dawson B, Goodman C, Lawrence S, Beilby J, Ching S. Effect of creatine loading on long-term sprint exercise performance and metabolism. Med Sci Sports Exerc 2001;33(5):814-21.
17 Vandenberghe K, Goris M, Van Hecke P, Van Leemputte M, Van Hecke P, Vanstapelf F, Hespel P. Long-term creatine intake is beneficial to muscle performance during resistance training. J Appl Physiol 1997;83:2055-63.
18 Beque MD, Lochmann JD, Melrose DR: Effects of oral creatine supplementation on muscular strength and body composition.
Med Sci Sports Exerc 2000;32:654-8.
19 Brose A, Parise G, Tarnopolsky MA. Creatine supplementation enhances isometric strength and body composition improvements following strength exercise training in older adults. J Gerontol A Biol Sci Med Sci 2003 Jan;58(1):11-9.
20 Chrusch MJ, Chilibeck PD, Chad KE, Davison DS, Burke DG. Creatine supplementation combined with resistance training in older men. Med Sci Sport Exerc 2001;33(12):2111-17.
21 Ziegenfuss TN, Lemon PWR, Rodgers MR, Ross R, Yarasheski KE. Acute creatine ingestion: effects on muscle volume, anaerobic power, fluid volumes and protein turnover. Med Sci Sports Exerc 1996;29:S732.
22 Willoughby DS, Rosene J. Effects of oral creatine and resistance training on myosin heavy chain expression. Med Sci Sports Exerc 2001;33(10):1674-81.

23 Volek JS, Duncan ND, Mazzetti SA, Staron RS, Putukian M, Gomez AL, Pearson DR, Fink WJ, Kraemer WJ. Performance and muscle fiber adaptation to creatine supplementation and heavy resistance training. Med Sci Sports Exerc 1999;31(8):1147-56.
24 Volek JS, Rawson ES. Scientific basis and practical aspects of creatine supplementation for athletes. Nu-

trition. 2004 Jul-Aug;20(7-8):609-14. Review.
25 Walker JB. Creatine: biosynthesis, regulation, and function. Adv Enzymol Relat Areas Mol Biol. 1979;50:177-242. Review.
26 Soderlund K, Balsom PD, Ekblom B. Creatine supplementation and high-intensity exercise: Influence on performance and muscle metabolism. Clin Sci 1998;87(Suppl):120-121.
27 Bennett SE, Bevington A, Walls J. Regulation of intracellular creatine in erythrocytes and myoblasts: influence of uraemia and inhibition of Na,K-ATPase. Cell Biochem Funct 1994 Jun;12(2):99-106.
28 Guimbal C, Kilimann MW. A Na(+)-dependent creatine transporter in rabbit brain, muscle, heart, and kidney. cDNA cloning and functional expression. J Biol Chem 1993 Apr 25;268(12):8418-21.
29 Schloss P, Mayser W, Betz H. The putative rat choline transporter CHOT1 transports creatine and is highly expressed in neural and muscle-rich tissues. Biochem Biophys Res Commun 1994 Jan 28;198(2):637-45.
30 Haugland RB, Chang DT. Insulin effect on creatine transport in skeletal muscle (38464). Proc Soc Exp Biol Med 1975 Jan;148(1):1-4.
31 Koszalka TR, Andrew CL, Brent RL. Effect of insulin on the uptake of creatine-1-14 C by skeletal muscle in normal and xirradiated rats. Proc Soc Exp Biol Med 1972 Apr;139(4):1265-71.
32 Odoom JE, Kemp GJ, Radda GK. Control of intracellular creatine concentration in a mouse myoblast cell line. Biochem Soc Trans 1993 Nov;21(4):441S.
33 Harris RC, Söderlund K, Hultman E. Elevation of creatine in resting and exercised muscle of normal subjects by creatine supplementation. Clin Sci (Lond). 1992 Sep;83(3):367-74.
34 Hultman E, Soderlund K, Timmons JA, Cederblad G, Greenhaff PL. Muscle creatine loading in men. J Appl Physiol 1996 Jul;81(1):232-7.
35 Sweeney HL. The importance of the creatine kinase reaction: the concept of metabolic capacitance. Med Sci Sports Exerc 1994 Jan;26(1):30-6.
36 Hultman E, Bergstrom J, Anderson NM. Breakdown and resynthesis of phosphorylcreatine and adenosine triphosphate in connection with muscular work in man. Scand J Clin Lab Invest 1967;19(1):56-66.
37 Stryer L. Biochemistry, 3rd ed. New York: Freeman & Company; 1988.
38 Wallimann T, Wyss M, Brdiczka D, Nicolay K, Eppenberger HM. Intracellular compartmentation, structure and function of creatine kinase isoenzymes in tissues with high and fluctuating energy demands: the 'phosphocreatine circuit' for cellular energy homeostasis. Biochem J 1992 Jan 1;281(Pt 1):21-40.
39 Febbraio MA, Flanagan TR, Snow RJ, Zhao S, Carey MF. Effect of creatine supplementation on intramuscular TCr, metabolism and performance during intermittent, supramaximal exercise in humans. Acta Physiol Scand 1995 Dec;155(4):387-95.
40 Gordon A, Hultman E, Kaijser L, Kristjansson S, Rolf CJ, Nyquist O, Sylven C. Creatine supplementation in chronic heart failure increases skeletal muscle creatine phosphate and muscle performance. Cardiovasc Res 1995 Sep;30(3):413-8.
41 Balsom PD, Ekblom B, Soderlund K, Sjodin B, Hultman E. Creatine supplementation and dynamic high-intensity intermittent exercise. Scand J Med Sci Sports 1993 Aug;3(3):143-149.
42 Birch R, Noble D, Greenhaff PL. The influence of dietary creatine supplementation on performance during repeated bouts of maximal isokinetic cycling in man. Eur J Appl Physiol 1994;69(3):268-76.
43 Harris RC, Viru M, Greenhaff PL, Hultman E. The effect of oral creatine supplementation on running performance during maximal short term exercise in man. J Physiol 1993;467:74P.
44 Volek JS, Kraemer WJ, Bush JA, Boetes M, Incledon T, Clark KL, Lynch JM. Creatine supplementation enhances muscular performance during high-intensity resistance exercise. J Am Diet Assoc 1997 Jul;97(7):765-70.
45 Balsom PD, Soderlund K, Sjodin B, Ekblom B. Skeletal muscle metabolism during short duration high-intensity exercise: influence of creatine supplementation. Acta Physiol Scand 1995 Jul;154(3):303-10.
46 Casey A, Constantin-Teodosiu D, Howell S, Hultman E, Greenhaff PL. Creatine ingestion favorably affects performance and muscle metabolism during maximal exercise in humans. Am J Physiol 1996 Jul;271(1 Pt 1):E31-7.
47 Grindstaff PD, Kreider R, Bishop R, Wilson M, Wood L, Alexander C, Almada A. Effects of creatine supplementation on repetitive sprint performance and body composition in competitive swimmers. Int J Sport Nutr 1997 Dec;7(4):330-46.
48 Schneider DA, McDonough PJ, Fadel PJ, Berwick JP. Creatine supplementation and the total work performed during 15-s and 1-min bouts of maximal cycling. Aust J Sci Med Sport 1997 Sep;29(3):65-8.
49 Bosco C, Tihanyi J, Pucspk J, Kovacs I, Gabossy A, Colli R, Pulvirenti G, Tranquilli C, Foti C, Viru M, Viru

A. Effect of oral creatine supplementation on jumping and running performance. Int J Sports Med 1997 Jul;18(5):369-72.
50 Prevost MC, Nelson AG, Morris GS. Creatine supplementation enhances intermittent work performance. Res Q Exerc Sport 1997 Sep;68(3):233-40.
51 Cribb PJ, Hayes A. Effects of supplement timing and resistance exercise on skeletal muscle hypertrophy. Med Sci Sports Exerc. 2006 Nov;38(11):1918-25.
52 Kreider RB, Klesges R, Harmon K, Grindstaff P, Ramsey L, Bullen D, Wood L, Li Y, Almada A. Effects of ingesting supplements designed to promote lean tissue accretion on body composition during resistance training. Int J Sport Nutr. 1996 Sep;6(3):234-46.
53 Olsen S, Aagaard P, Kadi F, Tufekovic G, Verney J, Olesen JL, Suetta C, Kjaer M. Creatine supplementation augments the increase in satellite cell and myonuclei number in human skeletal muscle induced by strength training. J Physiol. 2006 Jun 1;573(Pt 2):525-34. Epub 2006 Mar 31. Erratum in: J Physiol. 2006 Sep 15;575(Pt 3):971.
54 Deldicque L, Atherton P, Patel R, Theisen D, Nielens H, Rennie MJ, Francaux M. Effects of resistance exercise with and without creatine supplementation on gene expression and cell signaling in human skeletal muscle. J Appl Physiol. 2008 Feb;104(2):371-8. Epub 2007 Nov 29.
55 McFarlane C, Plummer E, Thomas M, Hennebry A, Ashby M, Ling N, Smith H, Sharma M, Kambadur R. Myostatin induces cachexia by activating the ubiquitin proteolytic system through an NF-kappaB-independent, FoxO1-dependent mechanism. J Cell Physiol. 2006 Nov;209(2):501-14.
56 Tarnopolsky M, Martin J. Creatine monohydrate increases strength in patients with neuromuscular disease. Neurology. 1999 Mar 10;52(4):854-7.
57 Vorgerd M, Grehl T, Jager M, Muller K, Freitag G, Patzold T, Bruns N, Fabian K, Tegenthoff M, Mortier W, Luttmann A, Zange J, Malin JP. Creatine therapy in myophosphorylase deficiency (McArdle disease): a placebo-controlled crossover trial. Arch Neurol. 2000 Jul;57(7):956-63.
58 Cribb PJ, Williams AD, Hayes A. A creatine-protein-carbohydrate supplement enhances responses to resistance training. Med Sci Sports Exerc. 2007 Nov;39(11):1960-8.
59 Ingwall JS. Creatine and the control of muscle-specific protein synthesis in cardiac and skeletal muscle. Circ Res 1976 May;38(5 Suppl 1):115-23.
60 Ingwall JS, Morales MF, Stockdale FE. Creatine and the control of myosin synthesis in differentiating skeletal muscle. Proc Natl Acad Sci USA. 1972 Aug;69(8):2250-3.
61 Ingwall JS, Weiner CD, Morales MF, Davis E, Stockdale FE. Specificity of creatine in the control of muscle protein synthesis. J Cell Biol 1974 Jul;62(1):145-51.
62 Zilber ML, Litvinova VN, Morozov VI, Pliskin AV, Pshendin AI, Rogozkin VA. [The creatine effect on RNA and protein synthesis in growing culture of chick embryo myoblasts]. Biokhimiia 1975 Jul-Aug;40(4):854-60.
63 Deldicque L, Atherton P, Patel R, Theisen D, Nielens H, Rennie MJ, Francaux M. Effects of resistance exercise with and without creatine supplementation on gene expression and cell signaling in human skeletal muscle. J Appl Physiol. 2008 Feb;104(2):371-8. Epub 2007 Nov 29.
64 Haussinger D, Lang F. Cell volume in the regulation of hepatic function: a mechanism for metabolic control. Biochim Biophys Acta 1991 Dec 12;1071(4):331-50.
65 Haussinger D, Roth E, Lang F, Gerok W. Cellular hydration state: an important determinant of protein catabolism in health and disease. Lancet 1993 May 22;341(8856):1330-2.
66 Haussinger D. The role of cellular hydration in the regulation of cell function. Biochem J 1996 Feb 1;313(Pt 3):697-710.
67 vom Dahl S, Haussinger D. Nutritional state and the swelling-induced inhibition of proteolysis in perfused rat liver. J Nutr 1996 Feb;126(2):395-402.
68 Cooke MB, Rybalka E, Williams AD, Cribb PJ, Hayes A. Creatine supplementation enhances muscle force recovery after eccentrically-induced muscle damage in healthy individuals. J Int Soc Sports Nutr. 2009 Jun 2;6:13.
69 Hespel P, Eijnde BO, Van Leemputte MV, Urso B, Greenhaff PL, Labarque V, Dymarkowski S, Van Hecke P, Richter EA. Oral creatine supplementation facilitates the rehabilitation on disuse atrophy and alters the expression of muscle myogenic factors in humans. J Phys 2001 Oct;536(2)625-33.

70 Guerrero-Ontiveros ML, Wallimann T. Creatine supplementation in health and disease. Effect of chronic creatine ingestion in vivo: down regulation of the expression of creatine transporter isoforms in skeletal muscle. Mol Cell Biochem 1998;184:427-37.
71 Williams MH, Kreider R, Branch JD: Creatine: The power supplement. Champaign, IL: Human Kinetics Publishers; 1999:252.

72 Kreider RB: Creatine. Sports Nutrition: Fats and Protein Edited by: Wolinsky I, Driskel J. CRC Press LLC: Boca Raton, FL; 2007:165-178.
73 Harris RC, Soderlund K, Hultman E. Elevation of creatine in resting and exercised muscle of normal subjects by creatine supplementation. Clin Sci 1992; 83:367-374.
74 Loike JD, Zalutsky DL, Kaback E, Miranda AF, Silverstein SC. Extracelluar creatine regulates creatine transport in rat and human muscle cells. Proc Natl Acad Sci USA 1988;85:807-11.
75 Green AL, Hultman E, Macdonald IA, Sewell DA, Greenhaff PL. Carbohydrate ingestion augments skeletal muscle creatine accumulation during creatine supplementation in humans. Am J Physiol 1996 Nov;271(5 Part 1):E821-6.
76 Green AL, Simpson EJ, Littlewood JJ, Macdonald IA, Greenhaff PL. Carbohydrate ingestion augments creatine retention during creatine feeding in humans. Acta Physiol Scand 1996 Oct;158(2):268-76.
77 Steenge GR, Simpson EJ, Greenhaff PL. Protein- and carbohydrate-induced augmentation of whole body creatine retention in humans. J Appl Physiol 2000;89:1165-71.
78 Pearson DR, Hamby DG, Russel W, Harris T. Long-term effects of creatine monohydrate on strength and power. J Strength Cond Res 1999;13(3):187-92.
79 Metzl JD, Small E, Levine SR, Gershel JC. Creatine use among young athletes. Pediatrics. 2001 Aug;108(2):421-5.
80 Felber S, Skladal D, Wyss M, Kremser C, Koller A, Sperl W. Oral creatine supplementation in Duchenne muscular dystrophy: a clinical and 31P magnetic resonance spectroscopy study. Neurol Res. 2000 Mar;22(2):145-50.
81 Felber S, Skladal D, Wyss M, Kremser C, Koller A, Sperl W. Oral creatine supplementation in Duchenne muscular dystrophy: a clinical and 31P magnetic resonance spectroscopy study. Neurol Res. 2000 Mar;22(2):145-50.
82 Tarnopolsky MA, Mahoney DJ, Vajsar J, Rodriguez C, Doherty TJ, Roy BD, Biggar D. Creatine monohydrate enhances strength and body composition in Duchenne muscular dystrophy. Neurology. 2004 May 25;62(10):1771-7.
83 Buford TW, Kreider RB, Stout JR, Greenwood M, Campbell B, Spano M, Ziegenfuss T, Lopez H, Landis J, Antonio J. International Society of Sports Nutrition position stand: creatine supplementation and exercise. J Int Soc Sports Nutr. 2007 Aug 30;4:6.
84 Shao A, Hathcock JN. Risk assessment for creatine monohydrate. Regul Toxicol Pharmacol. 2006 Aug;45(3):242-51. Epub 2006 Jun 30. Review.
85 Anomasiri W, Sanguanrungsirikul S, Saichandee P. Low dose creatine supplementation enhances sprint phase of 400 meters swimming performance. J Med Assoc Thai. 2004 Sep;87 Suppl 2:S228-32.
86 Bellinger BM, Bold A, Wilson GR, Noakes TD, Myburgh KH. Oral creatine supplementation decreases plasma markers of adenine nucleotide degradation during a 1-h cycle test. Acta Physiol Scand. 2000 Nov;170(3):217-24.
87 Burke DG, Smith-Palmer T, Holt LE, Head B, Chilibeck PD. The effect of 7 days of creatine supplementation on 24-hour urinary creatine excretion. J Strength Cond Res. 2001 Feb;15(1):59-62.
88 Cottrell GT, Coast JR, Herb RA. Effect of recovery interval on multiple-bout sprint cycling performance after acute creatine supplementation. J Strength Cond Res. 2002 Feb;16(1):109-16.
89 Eckerson JM, Stout JR, Moore GA, Stone NJ, Nishimura K, Tamura K. Effect of two and five days of creatine loading on anaerobic working capacity in women. J Strength Cond Res. 2004 Feb;18(1):168-73.
90 Jacobs I, Bleue S, Goodman J. Creatine ingestion increases anaerobic capacity and maximum accumulated oxygen deficit. Can J Appl Physiol. 1997 Jun;22(3):231-43.
91 Louis M, Poortmans JR, Francaux M, Berré J, Boisseau N, Brassine E, Cuthbertson DJ, Smith K, Babraj JA, Waddell T, Rennie MJ. No effect of creatine supplementation on human myofibrillar and sarcoplasmic protein synthesis after resistance exercise. Am J Physiol Endocrinol Metab. 2003 Nov;285(5):E1089-94. Epub 2003 Jun 24.
92 Louis M, Poortmans JR, Francaux M, Hultman E, Berre J, Boisseau N, Young VR, Smith K, Meier-Augenstein W, Babraj JA, Waddell T, Rennie MJ. Creatine supplementation has no effect on human muscle protein turnover at rest in the postabsorptive or fed states. Am J Physiol Endocrinol Metab. 2003

Apr;284(4):E764-70. Epub 2002 Dec 10.
93 Maganaris CN, Maughan RJ. Creatine supplementation enhances maximum voluntary isometric force and endurance capacity in resistance trained men. Acta Physiol Scand. 1998 Jul;163(3):279-87.
94 Mendel RW, Blegen M, Cheatham C, Antonio J, Ziegenfuss T. Effects of creatine on thermoregulatory responses while exercising in the heat. Nutrition. 2005 Mar;21(3):301-7.

95 Mihic S, MacDonald JR, McKenzie S, Tarnopolsky MA. Acute creatine loading increases fat-free mass, but does not affect blood pressure, plasma creatinine, or CK activity in men and women. Med Sci Sports Exerc. 2000 Feb;32(2):291-6.
96 Nelson AG, Day R, Glickman-Weiss EL, Hegsted M, Kokkonen J, Sampson B. Creatine supplementation alters the response to a graded cycle ergometer test. Eur J Appl Physiol. 2000 Sep;83(1):89-94.
97 Odland LM, MacDougall JD, Tarnopolsky MA, Elorriaga A, Borgmann A. Effect of oral creatine supplementation on muscle [PCr] and short-term maximum power output. Med Sci Sports Exerc. 1997 Feb;29(2):216-9.
98 Poortmans JR, Auquier H, Renaut V, Durussel A, Saugy M, Brisson GR. Effect of short-term creatine supplementation on renal responses in men. Eur J Appl Physiol Occup Physiol. 1997;76(6):566-7.
99 Smith JC, Stephens DP, Hall EL, Jackson AW, Earnest CP. Effect of oral creatine ingestion on parameters of the work rate-time relationship and time to exhaustion in high-intensity cycling. Eur J Appl Physiol Occup Physiol. 1998 Mar;77(4):360-5.
100 Smith SA, Montain SJ, Matott RP, Zientara GP, Jolesz FA, Fielding RA. Creatine supplementation and age influence muscle metabolism during exercise. J Appl Physiol. 1998 Oct;85(4):1349-56.
101 Stevenson SW, Dudley GA. Creatine loading, resistance exercise performance, and muscle mechanics. J Strength Cond Res. 2001 Nov;15(4):413-9.
102 Theodorou AS, Havenetidis K, Zanker CL, O'Hara JP, King RF, Hood C, Paradisis G, Cooke CB. Effects of acute creatine loading with or without carbohydrate on repeated bouts of maximal swimming in high-performance swimmers. J Strength Cond Res. 2005 May;19(2):265-9.
103 Volek JS, Mazzetti SA, Farquhar WB, Barnes BR, Gómez AL, Kraemer WJ. Physiological responses to short-term exercise in the heat after creatine loading. Med Sci Sports Exerc. 2001 Jul;33(7):1101-8.

CreatineXXL™

Goal

This product is designed to increase the well-known strength- and size-enhancing effects of creatine monohydrate supplementation by supplying additional compounds that work synergistically with creatine to optimize muscle cell volume and buffer lactate. Therefore, the goal of this product is to maximize and maintain muscle cell volume and cellular anabolic signaling during intense training regimens. This is while delaying the onset of fatigue at each exercise bout, leading to increased size and performance gains when compared to supplementing creatine alone. See Appendix 3: *Xtreme Muscle Stack: Creating the Perfect Anabolic Storm.*

Rationale

Cellular hydration is critical to regulating protein metabolism within muscle cells.[1,2] Cell swelling stimulates muscle protein synthesis (MPS)[3,4] and shrinkage increases protein degradation. Therefore, high cell volume can mimic the positive effects of the body's anabolic hormones on protein metabolism.
When the nutrients involved in cell swelling can be delivered throughout the day in the proper amounts, exercise-induced muscle protein synthesis could be amplified.[5,6,7,8] This formula contains scientifically validated compounds that can increase and maintain cell swelling, leading to increased gains in size, strength and performance.

Creatine monohydrate (CrM): Myriad published scientific articles have consistently reported that supplemental creatine monohydrate can safely[9] and dramatically improve training-induced strength,[10,11,12,13,14] performance,[4,12,14,15,16,17,18,19,20,21,22,23,24,25] size gains[4,7,26,27,28,29,30,31,32,33] and enhance recovery.[34] Creatine monohydrate supplementation has been shown to induce cell volume,[8] increase the diameter of fast twitch muscle fibers,[35] delay fatigue and increase force production when compared to a non-supplemented state.[36] All conditions can contribute to maximizing each training bout, leading to creatine supplementation's ability to increase long-term muscle and strength gains.

Beta-alanine: Exercise can raise H+ production via ATP/CP and glycolytic energy pathways.[37] This increased H+ concentration lowers blood and muscle pH and eventually leads to fatigue and decreased muscular work capacity. Studies show that supplemental beta-alanine can increase muscular content of carnosine (an intramuscular buffer of H+) by 42-80% (dependent upon dose and length of use),[38,39] delaying fatigue during prolonged, intense workouts.[40,41]

Recently beta-alanine supplementation alone, compared to placebos, has been shown to improve: exercise-induced lean body mass[42,43] and endurance performance[43] training volume while reducing feelings of fatigue,[44] sprint performance in endurance cycling,[45] and improve muscle endurance in the elderly.[46] All together beta-alanine supplementation at the proper dosages appears to a very safe[47] and effective ergogenic aid.[48,49]

Although creatine supplementation, by itself, has been shown numerous times to increase time to fatigue and training intensity, beta-alanine may enhance these effects when added to creatine.[37,40] Hoffman et al[37] demonstrated that creatine monohydrate plus beta-alanine reduced fatigue rates, providing a greater training stimulus and a higher volume of exercise performed when compared to creatine alone or a placebo. Additionally, the creatine plus beta-alanine group had greater increases in lean body mass (LBM) and larger decreases in body fat compared to the other subjects. The increase in training intensity and volume by the CrM and beta-alanine subjects may have led to their positive body composition outcomes.

Glutamine plays an important role in regulating protein synthesis. It acts as an anti-catabolic agent and may add to glycogen storage following exercise, thus serving as an important contributor to cell volume and muscle recovery.[2] During cell swelling, there is an increase in muscle cell glutamine transporters, allowing more glutamine uptake.[50,51] This formula uses glutamine peptide, which may allow greater absorption of glutamine than other forms.

Glycine is included in this formula because it is also involved in cell swelling and maintenance of cell volume.[2,52] Given in combination with the other cell swelling agents listed above, glycine may enhance the overall volumizing effect.

Typical Use

Dosage

- Gradually increase the number of capsules as shown below to keep the cell transporters from down-regulating and allow connective tissue and muscle recovery keep up with strength increases to help avoid injury
- For maximum benefit and results, CreatineXXL™ should only be used during intense training cycles
- Approximately 25-45 grams of carbohydrate should be ingested with each dose
- Incorporate with NO7Rage™ and AminoBoostXXL™ as part of the dotFIT "Xtreme Muscle Stack" to provide maximum muscle pump and continuous training results for serious exercisers and athletes

Table 1: CreatineXXL Intake Recommendations*

Week No.	Capsules per Day	Time	Training Intensity
1	8	30 min before workout (WO)*	High
2	12	8 caps 30 min before WO* (4 caps immediately after)	High
3	16	8 caps 30 min before WO* (8 caps immediately after)	High
4	16	8 caps 30 min before WO* (8 caps immediately after)	High
5	16	8 caps 30 min before WO* (8 caps immediately after)	High
6	16	8 caps 30 min before WO* (8 caps immediately after)	High
7	16	8 caps 30 min before WO* (8 caps immediately after)	High
8	16	8 caps 30 min before WO* (8 caps immediately after)	High
9	16	8 caps 30 min before WO* (8 caps immediately after)	High
10	16	8 caps 30 min before WO* (8 caps immediately after)	High
11	12	8 caps 30 min before WO* (4 caps immediately after)	Peak of training program or week of competition
12	8	split throughout the day	Off
13	0	0	Low/Med
14	0	0	Med/High

* For the maximum effect of creatine supplementation and increases in cell volume, all dosages should be taken with 25-45g of carbohydrate.

Precautions

See CreatineMonohydrate for precautions. Beta-alanine, glutamine and glycine appear to be well-tolerated at the suggested doses.

Contraindications

See CreatineMonohydrate for contraindications. Athletes who wish to prevent weight gain should avoid CreatineXXL. Women who are pregnant or lactating are contraindicated because of a lack of data for these populations.

Adverse Reactions

See CreatineMonohydrate for adverse reactions. Beta-alanine supplementation at 6.4 grams, twice the amount found in CreatineXXL has not reported any adverse events.[37,40] Glutamine and glycine are well-tolerated at the doses found in CreatineXXL.

Upper Limit/Toxicity

See CreatineMonohydrate for upper limit and toxicity information. 6.4 grams of beta-alanine[37,40] and 40 grams of alanine[53] have been safely used in clinical trials. Glutamine supplementation in a clinical setting often exceeds doses over 20 grams daily with no serious side effects.[54,56] Point eight g/kg per day of glycine has been used for up to six weeks without any severe side effects.[55]

Summary

Purpose

The supplement is the first of its kind and only available through dotFIT. The combination of ingredients (i.e. creatine and beta-alanine) have been shown to increase training intensity, training volume and lean muscle mass to a greater extent than creatine alone, making it the perfect choice for many size, strength and performance athletes.

- CreatineXXL by itself can be a weight (muscle) gain product for intermediate/advance exercisers and athletes seeking an advantage during high intensity, high-volume training regimes
- CreatineXXL can be used in combination with other performance products in order to amplify their effects, especially to overcome training and muscle size plateaus. CreatineXXL is incorporated into the dotFIT software dietary supplement recommendations as part of the muscle gain/performance recommendation for all intermediate/advanced athletes/exercisers that choose anaerobic performance/ muscle gain as the primary goal
- Those concerned with weight/muscle gain as a possible hindrance to performance may prefer not to use CreatineXXL and may seek other performance recommendations suggested by dotFIT

Unique Features

- The product works to not only increase muscle mass but also prolong time to fatigue during intense, high-volume training regimes
- No other performance/weight gain product on the market contains the above ingredients in amounts that have been shown to work synergistically to create a better stimulus for muscle/strength gain in convenient capsule form
- Can be used alone or with NO7Rage™ and AminoBoostXXL™ as part of the dotFIT "XtremeMuscle Stack" providing maximum muscle pump and continuous training results for serious exercisers and athletes
- dotFIT CreatineXXL capsules are engineered with a proprietary "Swell and Release" delivery system that offers tremendous advantages for increasing the speed in which nutrients are available for uptake before exercise. Scientifically proven system works by temporarily attracting fluid into the capsule upon ingestion which "pressurizes" or "swells" the contents for immediate release
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

DIRECTIONS: As a dietary supplement, **On High Intensity Training days:** take 8 capsules 30 minutes before workouts with 8 oz. of water or your favorite beverage. Then take the remaining 8 capsules throughout the remainder of the day. **On Non-Training days (during high intensity training cycles):** take 8 capsules, twice daily with morning and evening meals. For increased effect consume with 25-45g of a carbohydrate food/beverage. For maximum results use for a minimum of 4 weeks.

Supplement Facts

Serving Size: 8 Capsules — Servings Per Container: 60

Amount Per Serving		% Daily Value*
Creatine (as Creatine Monohydrate)	3,000 mg	**
Beta-Alanine	1,600 mg	**
dotFIT™ Proprietary Cell Hydration Complex (L-Glutamine, L-Glycine)	2,100 mg	**

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Magnesium Stearate, Silicon Dioxide

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial coloring, Flavoring or Preservatives added.

WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. Do not use if safety seal under cap is broken or missing. **KEEP OUT OF REACH OF CHILDREN.**

Storage Conditions: Store in a cool, dry place.

†These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

References

1 Haussinger D, Hallbrucker C, vom Dahl S, Decker S, Schweizer U, Lang F, Gerok W. Cell volume is a major determinant of proteolysis control in liver. FEBS Lett 1991 May 20;283(1):70-2.
2 Berneis K, Ninnis R, Haussinger D, Keller U. Effects of hyper- and hypoosmolality on whole body protein and glucose kinetics in humans. Am J Physiol. 1999 Jan;276(1 Pt 1):E188-95.
3 Hallbrucker C, vom Dahl S, Lang F, Gerok W, Haussinger D. Inhibition of hepatic proteolysis by insulin. Role of hormone-induced alterations of the cellular K+ balance. Eur J Biochem 1991 Jul 15;199(2):467-74
4 Haussinger D, Lang F. The mutual interaction between cell volume and cell function: a new principle of metabolic regulation. Biochem Cell Biol 1991 Jan;69(1):1-4.
5 Meijer AJ, Gustafson LA, Luiken JJ, Blommaart PJ, Caro LH, Van Woerkom GM, Spronk C, Boon L. Cell swelling and the sensitivity of autophagic proteolysis to inhibition by amino acids in isolated rat hepatocytes. Eur J Biochem 1993 Jul 15;215(2):449-54.
6 Kruppa J, Clemens MJ. Differential kinetics of changes in the state of phosphorylation of ribosomal protein S6 and in the rate of protein synthesis in MPC 11 cells during tonicity shifts. EMBO J 1984 Jan;3(1):95-100.
7 Stoll B, Gerok W, Lang F, Haussinger D. Liver cell volume and protein synthesis. Biochem J 1992 Oct 1;287 (Pt 1):217-22.
8 Kreider RB, Klesges R, Harmon K, Grindstaff P, Ramsey L, Bullen D, Wood L, Li Y, Almada A. Effects of ingesting supplements designed to promote lean tissue accretion on body composition during resistance training. Int J Sport Nutr 1996 Sep;6(3):234-46.
9 Dalbo VJ, Roberts MD, Stout JR, Kerksick CM. Putting to rest the myth of creatine supplementation leading to muscle cramps and dehydration. Br J Sports Med. 2008 Jul;42(7):567-73. Epub 2008 Jan 9. Review.
10 Volek JS, Kraemer WJ. Creatine supplementation : its effect on human muscular performance and body composition. J Strength and Cond Res 1996;10(3):200-10.
11 Volek JS, Kraemer WJ, Bush JA, Boetes M, Inclendon T, Clark KL, Lynch JM. Creatine supplementation enhances muscular performance during high-intensity resistance exercise. J Am Diet Assoc 1997;97:765-70.
12 Earnest DP, Snell PG, Rodriguez R, Almada AL, Mitchell TL. The effect of creatine monohydrate ingestion on anaerobic power indices, muscular strength and body composition. Acta Physiol Scand 1995;153:207-9.
13 Balsom PD, Soderlund K, Sjodin B, Ekblom B. Skeletal muscle metabolism during short duration high-intensity exercise: influence of creatine supplementation. Acta Physiol Scand 1995;154:303-10.
14 Preen D, Dawson B, Goodman C, Lawrence S, Beilby J, Ching S. Effect of creatine loading on long-term sprint exercise performance and metabolism. Med Sci Sports Exerc 2001;33(5):814-21.
15 Balsom PD, Ekblom B, et al. Creatine supplementation and dynamic high-neuromuscular performance. Eur J Appl Physiol 1985;53:287-293.
16 Birch E, Noble D, Greenhaff PL. The influence of dietary creatine supplementation on performance during repeated bouts of maximal isokinetic cycling in man. Eur J Appl Physiol 1994;69:268-270.
17 Greenhaff PL, Casey A, Short AH, et al. Influence of oral creatine supplementation of muscle torque during maximal short term exercise in man. Clini Sci (Colch) 1993 May;84(5):565-71.
18 Brannon TA, Adans GR, Conniff CL, Baldwin KM. Effects of creatine loading and training on running performance and biochemical properties of rat skeletal muscle. Am J Physiol 1998 Aug;255(2 Pt 1): E166-172.
19 Cox G, Mujika I, Tumilty D, Burke L. Acute creatine supplementation and performance during a field test simulating match play in elite female soccer players. Int J Sport Nutr Exerc Metab 2002 Mar;12(1):33-46.
20 Van Loon LJ, Oosterlaar AM, Hartgens F, Hesselink MK, Snow RJ, Wagenmakers AJ. Effects of creatine loading and prolonged creatine supplementation on body composition, fuel selection, sprint and endurance performance in humans. Clin Sci (Lond) 2003 Feb;104(2):153-62.
21 Ziegenfuss TN, Rogers M, Lowery L, Mullins N, Mendel R, Antonio J, Lemon P. Effect of creatine loading on anaerobic performance and skeletal muscle volume in NCAA Division I athletes. Nutrition. 2002 May;18(5):397-402.
22 Gotshalk LA, Volek JS, Staron RS, Denegar CR, Hagerman FC, Kraemer WJ. Creatine supplementation improves muscular performance in older men. Med Sci Sports Exerc 2002 Mar;34(3):537-43.
23 Tarnopolsky MA, MacLennan DP. Creatine Monohydrate Supplementation Enhances High-Intensity

Exercise Performance in Males and Females. Int J Sport Nutr and Exerc Metabol 2000;10:452-63.
24 Casey A, Constantin-Teodosiu D, Howell S, Hultman E, Greenhaff PL. Creation ingestion favorably affects performance and muscle metabolism during maximal exercise in humans. Am J Physiol 1996;271:E31-7.
25 Rawson ES, Volek JS. Effects of creatine supplementation and resistance training on muscle strength and

weightlifting performance. J Strength Cond Res. 2003 Nov;17(4):822-31. Review.
26 Beque MD, Lochmann JD, Melrose DR: Effects of oral creatine supplementation on muscular strength and body composition. Med Sci Sports Exerc 2000;32:654-8.
27 Brose A, Parise G, Tarnopolsky MA. Creatine supplementation enhances isometric strength and body composition improvements following strength exercise training in older adults. J Gerontol A Biol Sci Med Sci 2003 Jan;58(1):11-9.
28 Chrusch MJ, Chilibeck PD, Chad KE, Davison DS, Burke DG. Creatine supplementation combined with resistance training in older men. Med Sci Sport Exerc 2001;33(12):2111-17.
29 Ziegenfuss TN, Lemon PWR, Rodgers MR, Ross R, Yarasheski KE. Acute creatine ingestion: effects on muscle volume, anaerobic power, fluid volumes and protein turnover. Med Sci Sports Exerc 1996;29:S732.
30 Willoughby DS, Rosene J. Effects of oral creatine and resistance training on myosin heavy chain expression. Med Sci Sports Exerc 2001;33(10):1674-81.
31 Volek JS, Duncan ND, Mazzetti SA, Staron RS, Putukian M, Gomez AL, Pearson DR, Fink WJ, Kraemer WJ. Performance and muscle fiber adaptation to creatine supplementation and heavy resistance training. Med Sci Sports Exerc 1999;31(8):1147-56.
32 Volek JS, Rawson ES. Scientific basis and practical aspects of creatine supplementation for athletes. Nutrition. 2004 Jul- Aug;20(7-8):609-14. Review.
33 Vandenberghe K, Goris M, Van Hecke P, Van Leemputte M, Van Hecke P, Vanstapelf F, Hespel P. Long-term creatine intake is beneficial to muscle performance during resistance training. J Appl Physiol 1997;83:2055-63.
34 Cooke MB, Rybalka E, Williams AD, Cribb PJ, Hayes A. Creatine supplementation enhances muscle force recovery after eccentrically-induced muscle damage in healthy individuals. J Int Soc Sports Nutr. 2009 Jun 2;6:13.
35 Cribb PJ, Hayes A. Effects of supplement timing and resistance exercise on skeletal muscle hypertrophy. Med Sci Sports Exerc. 2006 Nov;38(11):1918-25.
36 Cribb PJ, Williams AD, Hayes A. A creatine-protein-carbohydrate supplement enhances responses to resistance training. Med Sci Sports Exerc. 2007 Nov;39(11):1960-8.
37 Hoffman J, Ratamess N, Kang J, Mangine G, Faigenbaum A, Stout J. Effect of creatine and beta-alanine supplementation on performance and endocrine responses in strength/power athletes. Int J Sport Nutr Exerc Metab. 2006 Aug;16(4):430-46.
38 Baguet A, Reyngoudt H, Pottier A, Everaert I, Callens S, Achten E, Derave W. Carnosine loading and washout in human skeletal muscles. J Appl Physiol. 2009 Mar;106(3):837-42. Epub 2009 Jan 8.
39 Kendrick IP, Kim HJ, Harris RC, Kim CK, Dang VH, Lam TQ, Bui TT, Wise JA. The effect of 4 weeks beta-alanine supplementation and isokinetic training on carnosine concentrations in type I and II human skeletal muscle fibres. Eur J Appl Physiol. 2009 May;106(1):131-8. Epub 2009 Feb 12.
40 Stout JR, Cramer JT, Mielke M, O'Kroy J, Torok DJ, Zoeller RF. Effects of twenty-eight days of beta-alanine and creatine monohydrate supplementation on the physical working capacity at neuromuscular fatigue threshold. J Strength Cond Res. 2006 Nov;20(4):928-31.
41 Hoffman J, Ratamess NA, Ross R, Kang J, Magrelli J, Neese K, Faigenbaum AD, Wise JA. Beta-alanine and the hormonal response to exercise. Int J Sports Med. 2008 Dec;29(12):952-8. Epub 2008 Jun 11.
42 Walter AA, Smith AE, Kendall KL, Stout JR, Cramer JT. Six weeks of high-intensity interval training with and without beta-alanine supplementation for improving cardiovascular fitness in women. J Strength Cond Res. 2010 May;24(5):1199-207.
43 Smith AE, Walter AA, Graef JL, Kendall KL, Moon JR, Lockwood CM, Fukuda DH, Beck TW, Cramer JT, Stout JR. Effects of beta-alanine supplementation and high-intensity interval training on endurance performance and body composition in men; a double-blind trial. J Int Soc Sports Nutr. 2009 Feb 11;6:5.
44 Hoffman JR, Ratamess NA, Faigenbaum AD, Ross R, Kang J, Stout JR, Wise JA. Short-duration beta-alanine supplementation increases training volume and reduces subjective feelings of fatigue in college football players. Nutr Res. 2008 Jan;28(1):31-5.
45 Van Thienen R, Van Proeyen K, Vanden Eynde B, Puype J, Lefere T, Hespel P. Beta-alanine improves sprint performance in endurance cycling. Med Sci Sports Exerc. 2009 Apr;41(4):898-903.

46 Stout JR, Graves BS, Smith AE, Hartman MJ, Cramer JT, Beck TW, Harris RC. The effect of beta-alanine supplementation on neuromuscular fatigue in elderly (55-92 Years): a double-blind randomized study. J Int Soc Sports Nutr. 2008 Nov 7;5:21.
47 Artioli GG, Gualano B, Smith A, Stout J, Lancha AH Jr. Role of beta-alanine supplementation on muscle carnosine and exercise performance. Med Sci Sports Exerc. 2010 Jun;42(6):1162-73. Review.

48 Derave W, Everaert I, Beeckman S, Baguet A. Muscle carnosine metabolism and beta-alanine supplementation in relation to exercise and training. Sports Med. 2010 Mar 1;40(3):247-63. doi: 10.2165/11530310-000000000-00000. Review.
49 Sale C, Saunders B, Harris RC Effect of beta-alanine supplementation on muscle carnosine concentrations and exercise performance. Amino Acids. 2010 Jul;39(2):321-33. Epub 2009 Dec 20. Review.
50 Haussinger D, Lang F, Bauers K, Gerok W. Control of hepatic nitrogen metabolism and glutathione release by cell volume regulatory mechanisms. Eur J Biochem 1990;188(3):689-695.
51 Low SY, Taylor PM, Rennie MJ. Responses of glutamine transport in cultured rat skeletal muscle to osmotically induced changes in cell volume. J Physiol (Lond) 1996 May 1;492 (Pt 3):877-85.
52 Haussinger D. The role of cellular hydration in the regulation of cell function. Biochem J 1996 Feb 1;313 (Pt 3):697-710.
53 Wiethop BV, Cryer PE. Alanine and terbutaline in treatment of hypoglycemia in IDDM. Diabetes Care. 1993 Aug;16(8):1131-6.
54 Prevost MC, Nelson AG, Morris GS. Creatine supplementation enhances intermittent work performance. Res Q Exerc Sport 1997 Sep;68(3):233-40.
55 Heresco-Levy U, Javitt DC, Ermilov M, Mordel C, Silipo G, Lichtenstein M. Efficacy of high-dose glycine in the treatment of enduring negative symptoms of schizophrenia. Arch Gen Psychiatry. 1999 Jan;56(1):29-36.
56 Den Hond E, Hiele M, Peeters M, Ghoos Y, Rutgeerts P. Effect of long-term oral glutamine supplements on small intestinal permeability in patients with Crohn's disease. JPEN J Parenter Enteral Nutr. 1999 Jan-Feb;23(1):7-11.

WorkoutExtreme™

Goal

This product is designed to increase exercise focus, performance, and intensity without water weight gain (as occurs with Creatine). The unique formula quickly supplies a group of compounds that have clinically demonstrated positive results in increasing energy levels and delaying the onset of fatigue. Users have the potential to improve training sessions and outcomes when properly consuming WorkoutExtreme (WE). Additionally, WorkoutExtreme can be used by anyone not bothered by stimulants, as a preworkout or daily "pick-me-up".

Rationale

The unique formulation contains several ingredients that have been shown to enhance the user's focus and work capacity. WE special synergistic formulation contains the following:

Caffeine

Caffeine is commonly ingested by people who exercise or participate in sports, due to its well established ergogenic and stimulant effects. It belongs to a group of compounds called the methylxanthines.[1] Caffeine has Generally Recognized As Safe (GRAS) status in the United States.[2]

Various studies have reported caffeine ingestion to cause an increase in mobilization of free fatty acids (FFA),[3,4,5,6] spare glycogen, stimulate the release of epinephrine, block the effects of adenosine[7] alter the calcium level in muscle, possibly increase blood pressure in non-habitual users[8] and stimulate the central nervous system.[9,10,11,12,13]

All of these physiological effects may explain caffeine's ability to reduce fatigue[14] improve concentration,[15] and enhance mental alertness.[8,16,17,18]

Caffeine also may stimulate specific tissues directly, such as adipose and peripheral blood vessels. Additionally, caffeine may stimulate neurons, cardiac muscles, relaxation of smooth muscle, and gastric acid secretions.[8,10] Lastly, numerous studies have demonstrated caffeine's ability to increase exercise performance time to exhaustion (see Figure 5).[8,19,20,21]

Caffeine's ergogenic (performance-enhancing) effects

Research investigating the effects of caffeine on a time trial in trained cyclist found that caffeine improved speed, peak power, and mean power.[22] Similar results were demonstrated in studies that found cyclists ingesting a caffeine drink prior to a time trial showed improvements in performance.[23,24] Studies indicate that ingestion of caffeine (e.g., 3-9 mg/kg taken 30 - 90 minutes before exercise) can spare carbohydrate use during exercise and thus improve endurance exercise capacity.[25,26] In addition to the apparent positive effects on endurance performance, caffeine has also been shown to improve repeated sprint performance benefiting the anaerobic athlete.[27,28] People that drink caffeinated drinks regularly, may experience less ergogenic benefits from caffeine.[29] There have been some unfounded concerns that consumption of caffeine prior to exercise may contribute to dehydration but recent studies do not supported this notion.[26,30,31,32] Caffeine doses above 9 mg/kg can result in urinary caffeine levels that exceed the doping threshold for many sport organizations.

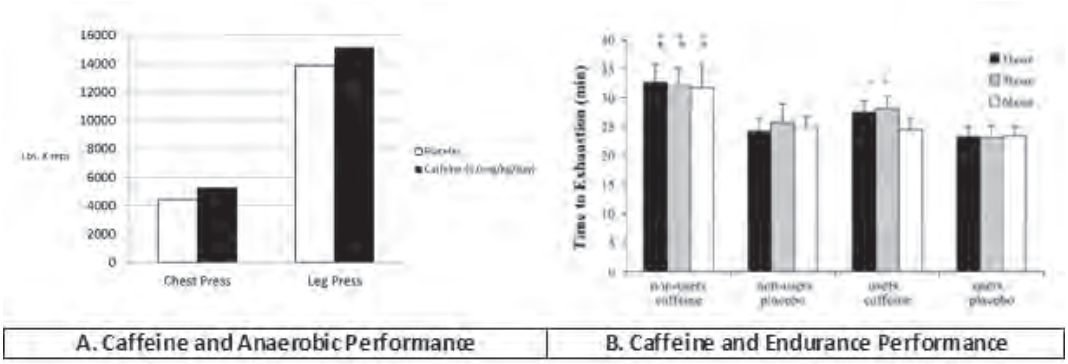

Figure 5 A & B: Figure 1a shows a significant increase in exercise volume and performance.[8] Figure 7b also shows caffeine's effects based on time of administration before exercise.[20]

Glucuronolactone

Glucuronolactone is a naturally occurring chemical compound produced by the metabolism of glucose in the liver. This metabolite acts by transferring an amino group during protein metabolism and is one of the major components of energy drinks worldwide. No studies yet have examined the effect of glucuronolactone ingestion alone on exercise performance. However, when ingested with taurine and caffeine, it has been shown to improve cognitive function, alertness, and physical performance due to its ability to fight fatigue and provide a sense of well-being.[33,34,35]

Taurine

Taurine is a conditionally essential, sulfur-containing amino acid that is the most abundant free amino acid in many tissues. Unlike other amino acids, Taurine is not incorporated into proteins, but it plays many roles in the body, including cell volume (osmoregulation),[36] bile acid conjugation, detoxification, membrane stabilization, and modulation of excitatory neurotransmitters and intracellular calcium levels.[37,38,39,40] More simply, taurine helps regulate heartbeat and muscle contractions, water balance, energy levels, and levels of neurotransmitters in the brain.[41]

Taurine is included in this formula to increase physical endurance[42,43] and reaction speed, increase concentration and mental alertness, improve overall feeling of well-being, enhance water balance and nutrient uptake in muscle cells, and aid in maintaining optimal hydration during exercise. Additionally Taurine supplementation studies continue to yield positive results related to muscle function, recovery and endurance performance.[44,45]

Panax Ginseng (American)

American ginseng is believed to have cooling and energizing effects on the body, whereas Korean ginseng is thought to have warming and calming effects. The Ginseng in the dotFIT formula is standardized to yield the ideal concentration of ginsenosides (the active ingredients of ginseng), giving it the potential to improve performance by sparing glycogen, increasing fat oxidation, and decreasing lactate accumulation.[46,47,48,49,50] Ginseng often acts as an adaptogen to build resistance to physical and mental stress.[51,52,53,54,55,56,57] High doses of Panax ginseng have been used in studies to support the claim that ginseng has ergogenic properties in aiding recovery from exhaustive exercise by attenuating oxidative stress.[58] For a complete recent review on ginseng please see article by Michael S. Bahrke, William P. Morgan, and Aaron Stegner.[59]

Typical Use

- Experienced athletes (aerobic and anaerobic) seeking to improve performance without water retention
- Do not use if individual experiences adverse effects from stimulants
- Do not mix with other stimulants
- Take four tablets approximately one hour before exercise with 8 oz of water. If this dose is too intense, use two tablets
- To use this product effectively, cycle for three weeks on and three weeks off during intense training cycles

Precautions

WorkoutExtreme™ contains central nervous system (CNS) stimulants and should be avoided by individuals sensitive to caffeine or who are contraindicated for caffeine-containing supplements. It is a common belief that caffeine ingestion causes dehydration leading to poor sports performance in athletes. However, recent scientific investigations have shown that acute caffeine ingestion does not alter hydration status in exercising adults.[32,60] Likewise, caffeine ingestion does not appear to cause ventricular or atrial arrhythmias except in extremely high doses (the equivalent of 8 cups of coffee per day).[1,61,62]

Contraindications

WorkoutExtreme™ supplementation is contraindicated in pregnancy and lactation because of the CNS stimulants caffeine and ginseng. Caffeine can interfere with some medications such as lithium and MAO inhibitors. Although evidence that caffeine ingestion causes cardiac arrhythmias is inconclusive, individuals should consult with their physician first before using WorkoutExtreme. Caffeine is contraindicated in heart disease, hyperthyroidism and peptic ulcers.

American ginseng (Panax) is contraindicated for those taking cholinesterase and MAO inhibitors, anticoagulants, antiplatelet drugs and hypoglycemic medicines because of potential interactions.

Adverse Reactions

Caffeine may cause insomnia when taken late in the day. Numerous studies on the safety of caffeine exist.[8] Caffeine abuse can cause tension, anxiety, excitability and restlessness at doses over 400 mg at once. Doses over 1000 mg at once can elicit toxicity symptoms. Adverse events of such high doses of caffeine are not likely to be seen at the recommended dose of WorkoutExtreme. Sensitive individuals may wish to start with a low dose and work up to the recommended dose. Clinical trials have not shown any adverse reactions with taurine.[63] Adverse reactions with Panax Ginseng are similar to those found in placebo controls.[64]

Glucuronolactone is a substance found in many caffeine- and taurine-containing energy drinks at doses of 500 mg or more per drink. It is considered safe and well-tolerated in these beverages.[65]

Taurine is an amino acid naturally present in many foods, especially meats and fish. It has been combined with caffeine in several beverage studies with no adverse events reported except in one study where a mild increase in mean arterial blood pressure (2.8 mm Hg average) and an eight-beat per minute reduction in heart rate were shown.[66,67,68] Taurine is used for congestive heart failure at higher doses from two to six grams daily to help increase stroke volume with few side effects such as mild diarrhea.[69] It is also used for other disease states such as hepatitis and cardiac arrhythmias doses from 12 to 20 grams daily were used.[43] Mild diarrhea was reported in a few subjects in the heart failure studies.

Upper Limit/Toxicity

Caffiene: doses of caffeine should not exceed 1000 mg/day leaving the dose in WorkoutExtreme™ at a safe level.

Taurine: Taurine has an LD50 in rats of greater than 64g/kg580 and is present in the human suggesting it is quite safe in this product.

Panax ginseng: no data available.

Glucuronolactone: no data available.

Summary

Purpose

- Athletes (aerobic and anaerobic) seeking an energy boost and/or to improve performance without water retention
- Ideal for endurance athletes not wishing to gain weight while improving performance
- Appropriate for use by anyone not bothered by stimulants as an energy enhancer
- Not for use by those who experience adverse effects from stimulants

Unique Features

- Increases workout energy and intensity without water weight gain in an easy-to-use-and-carry pill form
- Ginseng is standardized and certified for proper ginsenosides that have shown positive metabolic effects
- Uses a rapid release capsule delivery system to maximize the formula's potential and provides an immediate impact on training intensity
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Supplement Facts

Serving Size: 4 Capsules — Servings Per Container: 30

Amount Per Serving	% Daily Value**
Taurine	1000 mg *
Glucuronolactone	600 mg *
Panax Ginseng (root) (8% Ginsenosides)	300 mg *
Caffeine Anhydrous	300 mg *

** Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
* % Daily Value not established.

Other Ingredients: Gelatin, Magnesium Stearate, Microcrystalline Cellulose, Titanium Dioxide.

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.

WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. This product contains caffeine and should not be taken by those wishing to eliminate caffeine from their diets. Do not exceed recommended daily intake. Improper use of this product will not improve results and is not advised. Do not use if safety seal under cap is broken or missing. **KEEP OUT OF REACH OF CHILDREN.**

References

1 Sökmen B, Armstrong LE, Kraemer WJ, Casa DJ, Dias JC, Judelson DA, Maresh CM. Caffeine use in sports: considerations for the athlete. J Strength Cond Res. 2008 May;22(3):978-86. Review.
2 FDA. Center for Food Safety and Applied Nutrition, Office of Premarket Approval, EAFUS: A food additive database. Available at: vm.cfsan.fda.gov/~dms/eafus.html.
3 Costill DL, Dalsky GP, Fink WJ. Effects of caffeine ingestion on metabolism and exercise performance. Med Sci Sports 1978;10(3):155-8.
4 Ivy JL, Costill DL, Fink WJ, Lower RW. Influence of caffeine and carbohydrate feedings on endurance performance. Med Sci Sports 1979 Spring;11(1):6-11.
5 Essif D, Costill DL, Van Handel RJ. Effects of caffeine ingestion on utilization of muscle glycogen and lipid during leg ergometer cycling. Int J Sports Med 1980;1:86-90.
6 Knapik JJ, Jones BJ, Toner MM, Daniels WL, Evans WJ. Influence of caffeine on serum substrate changes during running in trained and untrained individuals. In: Knuttgen HG, Vogel JA, Poortmans J, editors. Biochemistry of exercise. Champaign (IL): Human Kinetics; 1983. p 514-520.
7 Jones G. Caffeine and other sympathomimetic stimulants: modes of action and effects on sports performance. Essays Biochem. 2008;44:109-23. Review.
8 Woolf K, Bidwell WK, Carlson AG. The effect of caffeine as an ergogenic aid in anaerobic exercise. Int J Sport Nutr Exerc Metab. 2008 Aug;18(4):412-29.
9 Wolinsky I, Hickson JF, editor. Nutrition in exercise and sport. Boca Raton (FL): CRC Press; 1993. p 317-318, 508 p.
10 Bucci L. Nutrients as ergogenic aids for sports and exercise. Boca Raton (FL): CRC Press; 1993. p 83-90, 161 p.
11 Berning JR, Steen SN. Nutrition for sport and exercise. Gaithersburg (MD): Aspen Publishers Inc.;

1998. p 122-123; 297 p.
12 Williams MH. The ergogenics edge: Pushing the limits of sports performance. Champaign (IL): Human Kinetics; 1998. p 149-153; 316 p.
13 Davis JM, Zhao Z, Stock HS, Mehl KA, Buggy J, Hand GA. Central nervous system effects of caffeine and adenosine on fatigue. Am J Physiol Regul Integr Comp Physiol. 2003 Feb;284(2):R399-404. Epub 2002 Oct 24.
14 Doherty M, Smith PM. Effects of caffeine ingestion on rating of perceived exertion during and after exercise: a meta-analysis. Scand J Med Sci Sports. 2005 Apr;15(2):69-78. Review.
15 Hewlett P, Smith A. Effects of repeated doses of caffeine on performance and alertness: new data and secondary analyses. Hum Psychopharmacol. 2007 Aug;22(6):339-50.
16 Lieberman HR, Tharion WJ, Shukitt-Hale B, Speckman KL, Tulley R. Effects of caffeine, sleep loss, and stress on cognitive performance and mood during U.S. Navy SEAL training. Sea-Air-Land. Psychopharmacology (Berl). 2002 Nov;164(3):250-61. Epub 2002 Sep 5.
17 Magill RA, Waters WF, Bray GA, Volaufova J, Smith SR, Lieberman HR, McNevin N, Ryan DH. Effects of tyrosine, phentermine, caffeine D-amphetamine, and placebo on cognitive and motor performance deficits during sleep deprivation. Nutr Neurosci. 2003 Aug;6(4):237-46.
18 Spriet LL, Gibala MJ. Nutritional strategies to influence adaptations to training. J Sports Sci. 2004 Jan;22(1):127-41. Review.
19 Bell DG, McLellan TM. Effect of repeated caffeine ingestion on repeated exhaustive exercise endurance. Med Sci Sports Exerc. 2003 Aug;35(8):1348-54.
20 Bell DG, McLellan TM. Exercise endurance 1, 3, and 6 h after caffeine ingestion in caffeine users and nonusers. J Appl Physiol. 2002 Oct;93(4):1227-34.
21 Doherty M, Smith PM. Effects of caffeine ingestion on exercise testing: a meta-analysis. Int J Sport Nutr Exerc Metab. 2004 Dec;14(6):626-46.
22 Wiles JD, Coleman D, Tegerdine M, Swaine IL: The effects of caffeine ingestion on performance time, speed and power during a laboratorybased 1 km cycling time-trial. J Sports Sci 2006, 24(11):1165-71.
23 Ivy JL, Kammer L, Ding Z, Wang B, Bernard JR, Liao YH, Hwang J: Improved cycling time-trial performance after ingestion of a caffeine energy drink. Int J Sport Nutr Exerc Metab 2009, 19(1):61-78.
24 McNaughton LR, Lovell RJ, Siegler J, Midgley AW, Moore L, Bentley DJ: The effects of caffeine ingestion on time trial cycling performance. Int J Sports Physiol Perform 2008, 3(2):157-63.
25 Applegate E: Effective nutritional ergogenic aids. Int J Sport Nutr 1999, 9(2):229-39.
26 Graham TE: Caffeine and exercise: metabolism, endurance and performance. Sports Med 2001, 31(11):785-807.
27 Carr A, Dawson B, Schneiker K, Goodman C, Lay B: Effect of caffeine supplementation on repeated sprint running performance. J Sports Med Phys Fitness 2008, 48(4):472-8.
28 Glaister M, Howatson G, Abraham CS, Lockey RA, Goodwin JE, Foley P, McInnes G: Caffeine supplementation and multiple sprint running performance. Med Sci Sports Exerc 2008, 40(10):1835-40.
29 Tarnopolsky MA, Atkinson SA, MacDougall JD, Sale DG, Sutton JR: Physiological responses to caffeine during endurance running in habitual caffeine users. Med Sci Sports Exerc 1989, 21(4):418-24.
30 Armstrong LE: Caffeine, body fluid-electrolyte balance, and exercise performance. Int J Sport Nutr Exerc Metab 2002, 12(2):189-206.
31 Falk B, Burstein R, Rosenblum J, Shapiro Y, Zylber-Katz E, Bashan N: Effects of caffeine ingestion on body fluid balance and thermoregulation
during exercise. Can J Physiol Pharmacol 1990, 68(7):889-92.
32 Armstrong LE, Casa DJ, Maresh CM, Ganio MS. Caffeine, fluid-electrolyte balance, temperature regulation, and exercise-heat tolerance. Exerc Sport Sci Rev. 2007 Jul;35(3):135-40. Review.
33 Alford C, Cox H, Wescott R. The effects of red bull energy drink on human performance and mood. Amino Acids. 2001;21(2):139-50.
34 Forbes SC, Candow DG, Little JP, Magnus C, Chilibeck PD. Effect of Red Bull energy drink on repeated Wingate cycle performance and bench-press muscle endurance. Int J Sport Nutr Exerc Metab. 2007 Oct;17(5):433-44.
35 Mets MA, Ketzer S, Blom C, van Gerven MH, van Willigenburg GM, Olivier B, Verster JC. Positive effects of Red Bull® Energy Drink on driving performance during prolonged driving. Psychopharmacology (Berl). 2010 Nov 10. [Epub ahead of print]
36 Schaffer S, Takahashi K, Azuma J. Role of osmoregulation in the actions of taurine. Amino Acids. 2000;19(3-4):527-46. Review.

37 Birdsall TC. Therapeutic applications of taurine. Altern Med Rev. 1998 Apr;3(2):128-36. Review.
38 Huxtable RJ. Physiological actions of taurine. Physiol Rev. 1992 Jan;72(1):101-63. Review.
39 Monograph: Taurine. Altern Med Rev. 2001;6(1):78-82.
40 Conte Camerino D, Tricarico D, Pierno S, Desaphy JF, Liantonio A, Pusch M, Burdi R, Camerino C, Fraysse B, De Luca A. Taurine and skeletal muscle disorders. Neurochem Res. 2004 Jan;29(1):135-42. Review.
41 Stipanuk MH. Role of the liver in regulation of body cysteine and taurine levels: a brief review. Neurochem Res. 2004 Jan;29(1):105-10. Review.
42 Miyazaki T, Matsuzaki Y, Ikegami T, Miyakawa S, Doy M, Tanaka N, Bouscarel B. Optimal and effective oral dose of taurine to prolong exercise performance in rat. Amino Acids. 2004 Dec;27(3-4):291-8. Epub 2004 Oct 22.
43 Zhang M, Izumi I, Kagamimori S, Sokejima S, Yamagami T, Liu Z, Qi B. Role of taurine supplementation to prevent exercise induced oxidative stress in healthy young men. Amino Acids. 2004 Mar;26(2):203-7. Epub 2003 May 9.
44 Imagawa TF, Hirano I, Utsuki K, Horie M, Naka A, Matsumoto K, Imagawa S. Caffeine and taurine enhance endurance performance. Int J Sports Med. 2009 Jul;30(7):485-8. Epub 2009 May 19.
45 Goodman CA, Horvath D, Stathis C, Mori T, Croft K, Murphy RM, Hayes A. Taurine supplementation increases skeletal muscle force production and protects muscle function during and after high-frequency in vitro stimulation. J Appl Physiol. 2009 Jul;107(1):144-54. Epub 2009 May 7.
46 Avakian EV, Sugimoto BR. Effect of Panax ginseng on energy substrates during exercise. Fed Proc 1980;39:287.
47 Avakian EV. Effect of Panax ginseng extract on energy metabolism during exercise in rats. Planta Medica 1984;50:462.
48 Samura MM. Effect of standardized ginseng extract G115 on the metabolism and electrical activity of the rabbit's brain. J Int Med Res 1985;13:342-348.
49 Wang BX, Cui JC, Liu AJ, Wu SK. Studies on the anti-fatigue effect of the saponins of stems and leaves of panax ginseng (SSLG). J Tradit Chin Med 1983 Jun;3(2):89-94.
50 Takagi K, Saito H, Tsuchiya M. Effect of Panax Ginseng root on spontaneous movement and exercise in mice. Jpn J Pharmacol 1974 Feb;24(1):41-8.
51 Samira MM, Attia MA, Allam M, Elwan O. Effect of standardized ginseng extract G115 on the metabolism and electrical activity of the rabbit's brain. J Int Med Res 1985;13(6):342-8.
52 Sterner W, Kirchdorfer AM. Comparative work load tests on mice with standardized ginseng extract and a ginseng containing pharmaceutical preparation. Z Gerontol 1970;(3):307-312.
53 Avakian EV Jr, Evonuk E. Effect of Panax ginseng extract on tissue glycogen and adrenal cholesterol depletion during prolonged exercise. Planta Med 1979 May;36(1):43-8.
54 Kaku T, Miyata T, Uruno T, Sako I, Kinoshita A. Chemico-pharmacological studies on saponins of Panax ginseng C. A. Meyer. II Pharmacological part. Arzneimittelforschung 1975 Apr;25(4):539-547.
55 Saito H, Yoshida Y, Takagi K. Effect of Panax ginseng root on exhaustive exercise in mice. Jpn J Pharmacol 1974 Feb;24(1):119-127.
56 Petkov W. Effect of ginseng on the brain biogenic monoamines and 3'5'-AMP system. Experiments in rats. Arzneimittel-Forsch 1979;(28):388-393.
57 Reay JL, Kennedy DO, Scholey AB. Effects of Panax ginseng, consumed with and without glucose, on blood glucose levels and cognitive performance during sustained 'mentally demanding' tasks. J Psychopharmacol. 2006 Nov;20(6):771-81. Epub 2006 Jan 9.
58 Kim SH, Park KS, Chang MJ, Sung JH. Effects of Panax ginseng extract on exercise-induced oxidative stress. J Sports Med Phys Fitness. 2005 Jun;45(2):178-82.
59 Bahrke MS, Morgan WP, Stegner A. Is ginseng an ergogenic aid? Int J Sport Nutr Exerc Metab. 2009 Jun;19(3):298-322. Review.
60 Roti MW, Casa DJ, Pumerantz AC, Watson G, Judelson DA, Dias JC, Ruffin K, Armstrong LE. Thermoregulatory responses to exercise in the heat: chronic caffeine intake has no effect. Aviat Space Environ Med. 2006 Feb;77(2):124-9.
61 Peters U, Poole C, Arab L. Does tea affect cardiovascular disease? A meta-analysis. Am J Epidemiol. 2001 Sep 15;154(6):495- 503. Erratum in: Am J Epidemiol 2002 Apr 15;155(8):781.
62 Katan MB, Schouten E. Caffeine and arrhythmia. Am J Clin Nutr. 2005 Mar;81(3):539-40.
63 Azuma J, Sawamura A, Awata N, et al. Therapeutic effect of taurine in congestive heart failure: a double-blind crossover trial. Clin Cardiol 1985;8:276-82.

64 McElhaney JE, Gravenstein S, Cole SK, et al. A Placebo-Controlled Trial of a Proprietary Extract of North American Ginseng (CVT-E002) to Prevent Acute Respiratory Illness in Institutionalized Older Adults. J Am Geriatr Soc 2004;52:13-9.
65 Horne JA, Reyner LA. Beneficial effects of an "energy drink" given to sleepy drivers. Amino Acids. 2001;20(1):83-9.
66 Bichler A, Swenson A, Harris MA. A combination of caffeine and taurine has no effect on short term memory but induceschanges in heart rate and mean arterial blood pressure. Amino Acids. 2006 May 15; [Epub ahead of print]
67 Seidl R, Peyrl A, Nicham R, Hauser E. A taurine and caffeine-containing drink stimulates cognitive performance and well-being. Amino Acids. 2000;19(3-4):635-42.
68 Warburton DM, Bersellini E, Sweeney E. An evaluation of a caffeinated taurine drink on mood, memory and information processing in healthy volunteers without caffeine abstinence. Psychopharmacology (Berl). 2001 Nov;158(3):322-8.
69 Eby G, Halcomb WW. Elimination of cardiac arrhythmias using oral taurine with l-arginine with case histories: Hypothesis for nitric oxide stabilization of the sinus node. Med Hypotheses. 2006;67(5):1200-4. Epub 2006 Jun 23.

Recover&Build™

Goal

This product provides the branched-chain amino acids (BCAA), leucine, isoleucine and valine, with leucine supplied in greater amounts consistent with recent research[1] with the goal of reducing exercise-induced muscle damage while enhancing recovery. BCAAs supplementation accomplishes this goal by

- Contributing substrate for energy demands[2]
- Enhancing muscle protein synthesis (MPS)[1,3,4]
- Attenuating muscle protein breakdown[5,6,7]

Faster recovery from exercise offers the participant the potential to enhance each subsequent training bout leading to a greater, long-term training outcome.

Rationale

Leucine, isoleucine and valine are the three branched-chain amino acids (BCAA) so named because of their molecular structure.[2] BCAAs compose approximately 35-40 percent of the amino acids found in body proteins (14-18% in skeletal muscle) and are oxidized in significant amounts in skeletal muscle.[8,9,10] The oxidation of BCAAs in muscle for energy may increase fivefold during strenuous exercise.[11,12] This occurs when BCAAs contribute their nitrogen group to pyruvate, an end product of glucose metabolism, to form alanine. Alanine is then transported back to the liver to reform glucose which can be shuttled back to the working muscles. This is known as the glucose-alanine cycle.[13,9] Supplying BCAAs prior to exercise may reduce the amount utilized from muscle pools, thus increasing muscular endurance[7,8,14,15] decreasing protein degradation and muscle soreness.[4,5,6,7,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30]

Greer et al demonstrated a greater reduction in creatine kinase (a marker of muscle damage) and muscle soreness with BCAA supplementation compared to a carbohydrate solution and placebo.[31] (See Figure 6.) Recent studies have found BCAAs (specifically leucine) to have an anabolic effect on skeletal muscle via mTOR (mammalian target of rapamysin), an enzyme that regulates protein synthesis.[20,32,33,34,35] Additionally, it may amplify insulin's anabolic properties, eliciting greater gains in lean muscle tissue and potentiating recovery from exercise. These findings suggest that not only are BCAAs building blocks for muscle protein synthesis but that leucine is a modulator of protein metabolism.[1,34,36] Also Leucine may have a positive impact, when delivered in high amounts, on improving exercise performance[37] and staving off the loss of lean body mass during dieting.[38]

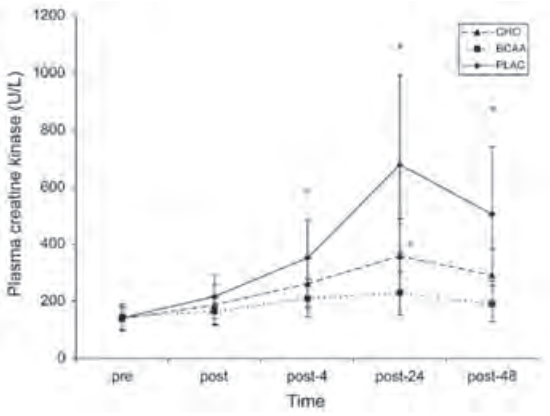

Figure 6: Plasma creatine kinase (CK) is shown to be accurate indicator of muscle damage, as shown here, BCAA supplementation decreases Cr kinase over 2 days.

It is hypothesized that the transport of tryptophan across the blood-brain-barrier (BBB) increases levels of 5-hydroxytryptamin (5-HT), leading to fatigue during long-duration exercise (e.g. endurance events).[39,40] An increase in serum BCAAs may reduce uptake of tryptophan during endurance exercise, hence decreasing 5-HT and central fatigue. When BCAA supplementation is supplied to endurance athletes, rates of

perceived exertion and mental fatigue have been shown to be reduced during exercise.[39,40] Recently BCAA supplementation demonstrated its ability to increase lactate thresholds in trained subjects[14,7] and increase mitochondrial ATP production rate in young participants,[15] both studies suggesting a role for BCAA supplementation in increasing endurance performance.

Leucine is the most potent regulator of protein synthesis, and is therefore provided in the largest amount in this unique formula.[1,29,36,41,42,43,44,45]

Isoleucine and Valine are supplied in a ratio that has been used in the most current research.[31]

In summary, BCAAs supplementation is designed to allow the body to spend more time, materials and energy building new muscle rather than simply repairing exercise-induced muscle damage. In addition, BCAA supplementation may reduce exercise fatigue during endurance-type training and competition.

Typical Use

- Athletes and exercisers of any fitness level during intense or excessive training bouts
- Weight-conscious athletes or in-season bodybuilders
- Anyone beginning a new intense exercise program
- Minimum dose: take five tablets before exercise
- Optimal dose and for those over 200 lbs, take eight tablets before exercise

Precautions

The supplementation of BCAA is generally considered safe. Those needing to avoid protein supplementation should also avoid BCAA supplementation.

Contraindications

BCAA supplementation is contraindicated in pregnancy and lactation because of the lack of studies done with this population. BCAA supplementation is contraindicated for those with the hereditary disorder maple syrup urine disease or who have kidney disorders.

Adverse Reactions

There are no known adverse reactions in healthy users at the recommended doses. Up to 50 grams per day have been used in hepatic encephalopathy patients for six months without any reported adverse reactions.[46]

Upper Limit/Toxicity

There are no reports concerning BCAA toxicity in relation to exercise and sports.[12,46]

Summary

Purpose

The anti-catabolic and anabolic effects of BCAA supplementation support the use of Recover&Build™ as a viable candidate for any athletic/fitness goal, when training is intense, to enhance recovery, minimize soreness and increase or maintain lean muscle.

Recover&Build can be used by

- Athletes and exercisers of any fitness level during intense or excessive training bouts
- Weight-conscious athletes or in-season bodybuilders
- Anyone beginning a new intense exercise program
- In combination with other performance products in order to amplify their effects, especially to enhance recovery

Unique Features

- Contains an ideal ratio of leucine, isoleucine and valine in a convenient tablet form

- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Supplement Facts

Serving Size: 5 Tablets — Servings Per Container: 20

Amount Per Serving	% Daily Value *
L-Leucine	3,835 mg **
L-Isoleucine	600 mg **
L-Valine	600 mg **

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Microcrystalline Cellulose, Dibasic Calcium Phosphate, Stearic Acid, Croscarmellose Sodium, Silicon Dioxide, Hydroxypropyl Cellulose, Magnesium Stearate

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.

WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. Do not use if safety seal under cap is broken or missing. **KEEP OUT OF REACH OF CHILDREN.**

Storage Conditions: Store in a cool, dry place.

References

1 Katsanos CS, Kobayashi H, Sheffield-Moore M, Aarsland A, Wolfe RR. A high proportion of leucine is required for optimal stimulation of the rate of muscle protein synthesis by essential amino acids in the elderly. Am J Physiol Endocrinol Metab. 2006 Aug;291(2):E381-7. Epub 2006 Feb 28.
2 Montgomery R, Conway TW, Spector AA. Biochemistry: A Case-Oriented Approach. St. Louis: The CV Mosby Company; 1993. 903p. pp.368
3 Liu Z, Jahn LA, Long W, Fryburg DA, Wei L, Barrett EJ. Branched chain amino acids activate messenger ribonucleic acid translation regulatory proteins in human skeletal muscle, and glucocorticoids blunt this action. J Clin Endocrinol Metab 2001;86:2136-43.
4 Blomstrand E, Saltin B. BCAA intake affects protein metabolism in muscle after but not during exercise in humans. Am J Physiol Endocrinol Metab 2001; 281: E365-74.
5 Shimomura Y, Inaguma A, Watanabe S, Yamamoto Y, Muramatsu Y, Bajotto G, Sato J, Shimomura N, Kobayashi H, Mawatari K. Branched-chain amino acid supplementation before squat exercise and delayed-onset muscle soreness. Int J Sport Nutr Exerc Metab. 2010 Jun;20(3):236-44.
6 Sharp CP, Pearson DR. Amino acid supplements and recovery from high-intensity resistance training. J Strength Cond Res. 2010 Apr;24(4):1125-30.
7 Matsumoto K, Koba T, Hamada K, Sakurai M, Higuchi T, Miyata H. Branched-chain amino acid supplementation attenuates muscle soreness, muscle damage and inflammation during an intensive training program. J Sports Med Phys Fitness. 2009 Dec;49(4):424-31.
8 MacLennan PA, Brown RA, Rennie MJ. A positive relationship between protein synthetic rate and intracellular glutamine concentration in perfused rat skeletal muscle. FEBS Lett 1987 May 4;215(1):187-191.
9 Riazi R, Wykes LJ, Ball RO, Pencharz PB. The total branched-chain amino acid requirement in young healthy adult men determined by indicator amino acid oxidation by use of L-[1-13C]phenylalanine. J Nutr. 2003 May;133(5):1383-9.
10 Gibala MJ. Regulation of skeletal muscle amino acid metabolism during exercise. Int J Sport Nutr Exerc Metab. 2001 Mar;11(1):87-108. Review.
11 Chang WK, Yang KD, Shaio MF. Lymphocyte proliferation modulated by glutamine: involved in the endogenous redox reaction. Clin Exp Immunol. 1999 Sep;117(3):482-8.
12 Shimomura Y, Murakami T, Nakai N, Nagasaki M, Harris RA. Exercise promotes BCAA catabolism: effects of BCAA supplementation on skeletal muscle during exercise. J Nutr. 2004 Jun;134(6 Suppl):1583S-1587S. Review.
13 James, Nancy E. "Branched-Chain Amino Acids" Sports Nutrition: Fats and Protein. Ed. Judy Driskell. CRC Press: Boca Raton, 2006. 244-246.
14 Matsumoto K, Koba T, Hamada K, Tsujimoto H, Mitsuzono R. Branched-chain amino acid supplementation increases the lactate threshold during an incremental exercise test in trained individuals. J Nutr Sci

Vitaminol (Tokyo). 2009 Feb;55(1):52-8.
15 Tatpati LL, Irving BA, Tom A, Bigelow ML, Klaus K, Short KR, Nair KS. The effect of branched chain amino acids on skeletal muscle mitochondrial function in young and elderly adults. J Clin Endocrinol Metab. 2010 Feb;95(2):894-902. Epub 2009 Dec 18.
16 Maclean DA, Kiens B, et al. Branched chain amino acid supplementation reduces muscle amino acid release after exercise. Med Sci Sports Exerc 1996;28(5supp):s181.
17 Blomstrand E, Enwsholme EA. Effect of branched-chain amino acid supplementation on the exercise induced change in aromatic amino acid concentration in human muscle. Acta Physiol Scand 1992;146:293-298.
18 Effects of branched chain amino acids and carnitine supplementation on protein degradation and substrate use in intercollegiate swimmers. Human Performance Lab, Old Dominion U, Norfolk, VA 1992.
19 Coombes JS, McNaughton LR. Effects of branched-chain amino acid supplementation on creatine kinase and lactate dehydrogenase after prolonged exercise. J Sports Med Phys Fitness 2000;40(3):240-6.
20 Blomstrand E, Eliasson J, Karlsson HK, Kohnke R. Branched-chain amino acids activate key enzymes in protein synthesis after physical exercise. J Nutr. 2006 Jan;136(1 Suppl):269S-73S. Review.
21 Gleeson M. Interrelationship between physical activity and branched-chain amino acids. J Nutr. 2005 Jun;135(6 Suppl):1591S-5S. Review.
22 Shimomura Y, Yamamoto Y, Bajotto G, Sato J, Murakami T, Shimomura N, Kobayashi H, Mawatari K. Nutraceutical effects of branched-chain amino acids on skeletal muscle. J Nutr. 2006 Feb;136(2):529S-532S.
23 Lemon PW, Nagle FJ. Effects of exercise on protein and amino acid metabolism. Med Sci Sports Exer 1981;13(3):141-9.
24 White TP, Brooks GA. [U-14C]glucose, -alanine, and -leucine oxidation in rats at rest and two intensities of running. Am J Physiol 1981 Feb;240(2):E155-65.
25 Garlick PJ, Grant I. Amino acid infusion increases the sensitivity of muscle protein synthesis in vivo to insulin. Effect of branched chain amino acids. Biochem J 1988 Sep 1;254(2):579-84.
26 Wolfe RR, Wolfe MH, Nadel ER, Shaw JH. Isotopic determination of amino acid-urea interactions in exercise in humans. J Appl Physiol 1984 Jan;56(1):221-9.
27 Harper AE, Benjamin E. Relationship between intake and rate of oxidation of leucine and alpha-ketoisocaproate in vivo in the rat. J Nutr 1984 Feb;114(2):431-40.
28 Henderson SA, Black AL, Brooks GA. Leucine turnover and oxidation in trained rats during exercise. Am J Physiol 1985 Aug;249(2 Pt 1):E137-44.
29 Hood DA, Terjung RL. Effect of endurance training on leucine metabolism in perfused rat skeletal muscle. Am J Physiol 1987 Dec;253(6 Pt 1):E648-56.
30 Tipton KD, Wolfe RR. Exercise, protein metabolism, and muscle growth. Int J Sport Nutr Exerc Metab. 2001 Mar;11(1):109-32. Review.
31 Greer BK, Woodard JL, White JP, Arguello EM, Haymes EM. Branched-chain amino acid supplementation and indicators of muscle damage after endurance exercise. Int J Sport Nutr Exerc Metab. 2007 Dec;17(6):595-607.
32 Lynch CJ, Halle B, Fujii H, Vary TC, Wallin R, Damuni Z, Hutson SM. Potential role of leucine metabolism in the leucine-signaling pathway involving mTOR. Am J Physiol Endocrinol Metab. 2003 Oct;285(4):E854-63. Epub 2003 Jun 17.
33 Drummond MJ, Rasmussen BB. Leucine-enriched nutrients and the regulation of mammalian target of rapamycin signaling and human skeletal muscle protein synthesis. Curr Opin Clin Nutr Metab Care. 2008 May;11(3):222-6. Review.
34 Dreyer HC, Drummond MJ, Pennings B, Fujita S, Glynn EL, Chinkes DL, Dhanani S, Volpi E, Rasmussen BB. Leucine-enriched essential amino acid and carbohydrate ingestion following resistance exercise enhances mTOR signaling and protein synthesis in human muscle. Am J Physiol Endocrinol Metab. 2008 Feb;294(2):E392 -400. Epub 2007 Dec 4.
35 Stipanuk MH. Leucine and protein synthesis: mTOR and beyond. Nutr Rev. 2007 Mar;65(3):122-9. Review.
36 Rieu I, Balage M, Sornet C, Giraudet C, Pujos E, Grizard J, Mosoni L, Dardevet D. Leucine supplementation improves muscle protein synthesis in elderly men independently of hyperaminoacidaemia. J Physiol. 2006 Aug 15;575(Pt 1):305-15. Epub 2006 Jun 15.
37 Crowe MJ, Weatherson JN, Bowden BF. Effects of dietary leucine supplementation on exercise performance. Eur J Appl Physiol. 2006 Aug;97(6):664-72. Epub 2005 Oct 29.

38 Jitomir J, Willoughby DS. Leucine for retention of lean mass on a hypocaloric diet. J Med Food. 2008 Dec;11(4):606-9. Review.
39 Blomstrand E. A role for branched-chain amino acids in reducing central fatigue. J Nutr. 2006 Feb;136(2):544S-547S.
40 Newsholme EA, Blomstrand E. Branched-chain amino acids and central fatigue. J Nutr. 2006 Jan;136(1 Suppl):274S-6S.
41 Knopf RF, et al. Plasma growth hormone responses to intravenous administration of amino acids. Clin Endocrinol 1965;25:1140.
42 Norton LE, Layman DK. Leucine regulates translation initiation of protein synthesis in skeletal muscle after exercise. J Nutr. 2006 Feb;136(2):533S-537S.
43 Fujita S, Dreyer HC, Drummond MJ, Glynn EL, Volpi E, Rasmussen BB. Essential amino acid and carbohydrate ingestion prior to resistance exercise does not enhance post-exercise muscle protein synthesis. J Appl Physiol. 2008 Jun 5. [Epub ahead of print]
44 Fujita S, Dreyer HC, Drummond MJ, Glynn EL, Cadenas JG, Yoshizawa F, Volpi E, Rasmussen BB. Nutrient signaling in the regulation of human muscle protein synthesis. J Physiol. 2007 Jul 15;582(Pt 2):813-23. Epub 2007 May 3.
45 Fujita S, Volpi E. Amino acids and muscle loss with aging. J Nutr. 2006 Jan;136(1 Suppl):277S-80S. Review.
46 Baker DH. Tolerance for branched-chain amino acids in experimental animals and humans. J Nutr. 2005 Jun;135(6 Suppl):1585S-90S. Review.

AminoBoostXXL™

Goal

The objective of AminoBoostXXL™ is to supply the proper combination of amino acids that have been shown to increase exercise-induced protein synthesis (when compared to normal feeding alone) and deliver them at ideal times in order to maximize "intense training-induced specific windows" of opportunities for anabolism that take place throughout the day. Proper ingestion would maximize the unique muscle protein synthesis mechanism that is activated through the feeding of amino acids (AA) and potentially lead to greater strength and size gains, especially when exercise-induced results have stabilized (i.e. the training plateau). See Appendix 3: *Xtreme Muscle Stack: Creating the Perfect Anabolic Storm*.

Rationale

It has been well demonstrated that AA feeding stimulate protein synthesis independently of all other mechanisms.[1,2,3] Resistance training stimulates an increase in the synthetic rate of muscle proteins, but following exercise protein balance is negative until amino acids (AA) are provided.[4] The immediate post-training feeding-induced stimulation of protein synthesis (PS) has been shown to be independent of all other factors (e.g. insulin, exercise, normal meal consumption, etc.).[4,5] This is probably due to the increased delivery of AA, especially leucine[6,7,8] to muscle. Because the effects of feeding and exercise stimulation on muscle protein synthesis (MPS) are independent and additive (meaning they induce MPS by different mechanisms), then delivered closely in an ideal combination (e.g. before and after training), MPS at that point in time can be maximized. Information about the individual amino acids in AminoBoostXXL is found below. The reader is also directed to a 2010 complete review on pre- and post-exercise amino acid feedings, dosages and times of ingestions.[9] Unequivocal evidence exists to support the use of specific blends of proteins and/or amino acids combinations (especially essential amino acids[10,11,12]) for enhancing protein synthesis beyond what can be accomplished with normal feedings and exercise regiments.[9,13,14] Additionally, amino acid blends in proper formulas such as AminoBoostXXL before and after workouts can keep the caloric content in a lower range compared to whole proteins while also increasing protein synthesis to a greater extent than proteins alone.[9,11,12,15,16,17]

BCAA (Leucine, Isoleucine, Valine): See dotFIT Recover&Build™

For more on all amino acids please see the comprehensive review by Neal Spruce and Dr. Alan Titchenal in the publication *Sports Nutrition, Fats and Proteins*.[18]

Phenylalanine: Phenylalanine (P) is an essential amino acid that participates in protein synthesis. It is converted to tyrosine via hydroxylation. Phenylalanine is both glucogenic and ketogenic.[19] Sports drinks that contain a mixture of carbohydrate and free-form amino acids, including phenylalanine, can result in a greater insulin response than carbohydrate by itself.[20,21]

Lysine: L-lysine is an indispensable dibasic amino acid (L-2,6-diaminohexanoic acid) required for human growth and for maintaining nitrogen balance in adults. Lysine cannot be synthesized by the body, and therefore must be supplied through diet.[22] Lysine, like most other amino acids, is a building block of body proteins. Among the indispensable AA, lysine is present in the greatest amounts, at 93.0 mmol/dl and 38 mmol/dl in tissues and serum respectively. Lysine is also required for collagen synthesis, and may be central to bone health.[23,24]

Threonine: Threonine is an essential amino acid often low in vegetarian diets. Aminotransferases exist for all amino acids except threonine and lysine. Its main routes of catabolism lead to both ketogenic and glucogenic metabolites.[25] The human requirement for threonine set by FAO/WHO/UNU at 7mg/kg/day[26] has been challenged by more recent data suggesting a level more than twice this amount to maintain AA homeostasis[27,28] in healthy adults. The Institute of Medicine recently established a threonine RDA for adults at 27 mg/kg/day.[29]

Histidine: The end product of histidine catabolism is glutamate, making histidine one of the glucogenic

amino acids. Kriengsinyos, et al. investigated histidine's essentiality in healthy adult humans consuming a histidine-free diet for 48 days. They discovered a gradual decrease in protein turnover and a substantial decrease in plasma protein concentrations, including albumin, hemoglobin, and transferrin. So, although histidine deficiency may not affect nitrogen equilibrium, it can impact other important health parameters.[30] Histidine, like cysteine also may have antioxidant properties.[31] In regard to sports/fitness applications, histidine alone has not been studied as a supplement for improving athletic outcomes. Carnosine is related metabolically to histidine and histamine. It is a naturally occurring histidine-containing dipeptide present in muscle tissue. Being immuno-protective, carnosine has been shown to detoxify free-radical species, protect cell membranes, and act as a buffer against lactic acid and hydrogen ions.[32] This is especially important in athletic events where lactic acid buildup (metabolic acidosis) can affect performance by causing fatigue.[33] Intracellular buffering agents such as phosphates and histidine-containing peptides may help delay fatigue by buffering hydrogen ions, reducing oxidative damage, and maintaining cell membrane integrity.[34,35,36]

Methionine: Methionine is a major source of sulfur in human diets, and is an essential amino acid for normal growth and development. It is considered glucogenic, due to its conversion to pyruvic acid via succinyl CoA. It is a major methyl-donor, and important in the metabolism of phospholipids. It is also prominent in methylation reactions, and as a precursor for cysteine, which is the rate-limiting AA for glutathione synthesis. High levels of methionine are associated with hyperhomocysteinemia and endothelial dysfunction, which are risk factors for cardiovascular disease.[37] Deficiency of methionine produces hepatic steatosis similar to that seen with ethanol,[38] and supplementation with this lipotrope can prevent ethanol-induced fatty liver.[38] Besides methionine's role in methyl-group metabolism, and in serving as a substrate for protein synthesis, its other functions include participation in the synthesis of polyamines, catecholamines, nucleic acids, carnitine, and creatine.[39,40,41] Because of its many functions, methionine has a high intracellular turnover.[42,43] It may be the amino acid that is most rate-limiting for the building of body proteins, including maintaining nitrogen balance and the effective reutilization of the other amino acids.[44,45] Therefore, the requirement for methionine increases significantly during times of high protein turnover, such as is seen in burn and trauma patients.[46,47]

The majority of these essential amino acids with the exception of leucine have not been studied or tested as an ergogenic substance by itself.

Typical Use

- All intermediate to advanced exercisers/athletes during intense training cycles
- Especially important aid for all experienced older hard training exercisers/athletes
- This product can be used by itself (e.g., without creatine products) especially for intensely training athletes not desiring quick weight gain but who need rapid muscle tissue recovery (all track, basketball, most baseball, wrestlers, boxers, runners, cyclists, etc.) based on frequent events and/or training sessions
- All experienced, aspiring and competitive bodybuilders and other anaerobic athletes attempting to increase muscle size and strength, especially during prolonged negative energy balance (dieting)
- Can be used alone or with NO7Rage™ and CreatineXXL™ as part of the dotFIT™ "Xtreme Muscle Stack" providing maximum muscle pump and continuous training results for serious exercisers and athletes

Dosage

Considering all data to date, including managing the delicate interplay between insulin and its ability to maximize muscle protein synthesis, we can establish a potential dosage recommendation range including timing and amounts that may "cover most bases" (i.e., compensate for individuality) to create a better, more constant exercise-induced anabolic environment as opposed to a chronic non-supplemented state.

Maintaining adequate protein and energy intake at ~1.5-2 g/kg of body weight/day (not including the grams of the AminoBoostXXL™) and no more than a 10-20% calorie deficit, a safe and potentially effective recommendation for most healthy athletes during intense training cycles is listed below.

Ranges based on size (<150 lbs. use 8 g dose; >150 lbs. use 16 g dose; those in between adjust accordingly) or greater stresses such as prolonged dieting, extreme training conditions in which users may increase the dose within the published range (no need for anyone to exceed a 16 g dose).

Each training day* (ranges based on size or greater stresses, e.g., prolonged dieting, extreme training conditions, etc.):

- Ten to 30 minutes pre-workout: Drink 20-40 g of CHO with 8 to 16 g of AminoBoostXXL
- Use dotFIT Pre/Post Workout Formula & Meal Replacement™ for carbohydrate and added protein source
- Immediately following training: ingest 8 to 16 g of AminoBoostXXL
- Twenty to 40 minutes after post workout AminoBoostXXL ingestion, consume a mixed meal drink of ~30-50 g of CHO with 15-30gms of protein and low fat (2-4 g)
- Use dotFIT Pre/Post Workout Formula & Meal Replacement for carbohydrate and added protein source
- Consume normal post-workout whole food meal at ~ two hours post-training

* Optional for potentially maximizing results: repeat the 8 to 16 g AminoBoostXXL ~one hour before next meal or before bedtime.

Precautions

Presently, insufficient data exist to use the risk assessment model for determining an upper limit (UL) for any of the amino acids. Furthermore, chronic excessive use of individual amino acids is likely to be highly unusual in athletes (no perceived value at levels that may lead to danger) and potentially uncomfortable (e.g., stomach distress). Consequently, collecting data on amino acid toxicity is difficult and possibly unnecessary.

Reported adverse events from acute and chronic high-level intake of amino acids are extremely rare.[48]

Amino acid supplementation safety appears to have survived the "test of time" as it relates to use by athletes. Despite the lack of adverse events reported by athletes who use amino acid products and the lack of UL values for amino acids, the safety of chronic high intakes of amino acids is unknown. However, the risk/benefit ratio appears to be extremely low. And the amounts present in the AminoBoostXXL™ do not approach any level of amino acid intake that may lead adverse events. Phenylketonuria (PKU) is a rare disease (generally diagnosed at birth) caused by an inborn error in the ability to metabolize phenylalanine (lacking the enzyme phenylalanine hydroxylase).[49] In affected people, if the diet is not controlled by severe restriction of phenylalanine intake, PKU can lead to serious irreversible neurological disorders, such as mental retardation. Because homocysteinemia is linked with cardiovascular disease, long-term use of methionine supplements may be of concern.[50]

Contraindications

This product, as with any protein or creatine-containing supplement, is contraindicated for users with kidney or liver disease. This product is contraindicated for phenylketonurics because it contains phenylalanine. This product is also contraindicated for pregnant or lactating females because it has not been tested in these groups and because protein can be adequately supplied by the diet for fetal growth or lactation needs.

Adverse Reactions

BCAA have been used in studies in doses of at least 12 g/day with no side effects, making the dose in AminoBoostXXL quite safe for healthy users.[51]

Lysine is often used for herpes simplex at an oral dose of 1 to 3 g/day. It has been used in doses from

400 mg to 6 g/day without adverse events. Above 8 g/day, however, can cause profuse watery diarrhea in those with lysinuric protein intolerance.[52,53] These studies suggest the lysine in AminoBoostXXL should be well tolerated in healthy users.

Methionine: The average American consumes at least 2 grams (2000 mg) of methionine each day.[54] Two point five grams every four hours for 16 hours has been used for acetaminophen poisoning and for liver disorders.[55] Methionine is frequently used in doses of 100 mg/kg to test individuals with various diseases and levels of homocysteine in their blood.[54,56]

The 100 mg/kg dose is generally considered a safe dose during short-term use for medical testing with mild side effects reported.[57] One hundred mg/kg is a much larger dose than users will receive in AminoBoostXXL™. Coincidentally, both methionine deficiency and an excessive acute intake (>100 mg/kg) are associated with liver diseases and other adverse events.[58,59] These studies suggest the methionine in AminoBoostXXL should be well tolerated in healthy users.

Histidine supplementation in doses of 4 g/day has shown no side effects,[60] whereas doses of 24 to 64 g have caused anorexia and increased urinary zinc excretion.[61] These studies suggest the histidine in AminoBoostXXL should be well tolerated in healthy users.

Threonine has been used for spinal spasticity and amyotrophic lateral sclerosis (Lou Gehrig's disease) in doses from 2 to 7.5 g/day.[59,62] Threonine in doses up to 4 g/day is associated with mild adverse events ranging from nothing to slight GI discomfort. One study of spasticity at 7.5 g/day showed no adverse events.[62] These studies suggest the threonine in AminoBoostXXL should be well tolerated in healthy users.

Phenylalanine has been used for a depigmentation disorder called vitiligo in doses of up to 100 mg/kg with minimal to no side effects.[63] A typical 154 pound athlete would be consuming 7 g/day at that dose, making the amount in AminoBoostXXL safe for users without PKU.

Overall, essential amino acid supplementation in combined doses from 6 to 40 g/day and as described here is well tolerated in individuals without PKU, kidney or liver disease.[64,65]

Upper Limit/Toxicity

- Amino acid blends and protein supplements have been studied for use in numerous disease states and to improve sports performance for decades with a large margin of safety between the typical doses and those needed for toxic effects in healthy users[64,65,66]
- In addition, the amino acids in AminoBoostXXL all appear on the Generally Regarded As Safe (GRAS) list and are in forms which may be safely used when added to foods[67]

Table 1: Toxicity in animals*

AA	NOAEL/LOAELT	LD_{50} Mouse	LD_{50} Rat
Histidine	>4.5 g/d	15,000 mg/kg orally	15,000 mg/kg orally
Isoleucine	14.4 g BCAA/d		6822 mg/kg*
Leucine	>6 g/d		5379 mg/kg*
Lysine	3–40 g/d		10,000 mg/kg^
Methionine	5 g/d	9500 mg/kg*	36,000 mg/kg orally
Phenylalanine	>4 g/d	1322 mg/kg*	5287 mg/kg*
Threonine	>6 g/d		3098 mg/kg*
Valine	14.4 g BCAA/d		5390 mg/kg*

* Intraperitoneal
**Data from TOXNET; ChemIDplus Lite.
^ Data from MSDS sheets.
†Derived from Garlick et al.[50] Doses given are levels used in studies that showed mild to no adverse events and are clearly below toxic levels.

Summary

Purpose

- The product is a new discovery and thus has no competitor as it relates to formula and concept and is 100% defensible and safe
- The product can stand alone, especially for hard training athletes not wanting quick weight gain but needing rapid muscle tissue recovery (all track, basketball, most baseball, wrestlers, boxers, runners, cyclists, etc.) based on frequent events/training sessions
- All older, hard training exercisers/athletes
- Physique competitors, especially during prolonged negative energy balance (dieting)
- An essential component in a unique sequence for experienced adult strength and size exercisers/athletes
- Ideal for use in those at a plateau trying to add muscle

Unique Features

- The formula uses an EAA blend that was shown to significantly increase muscle protein synthesis in clinical trials with both adult athletes and non-athletes
- The AminoBoostXXL supplement contains a proprietary EAA composition that is designed to increase the availability of the EAA in proportion to their requirement for muscle protein synthesis (MPS) – many studies have confirmed that under normal diet conditions, the EAA are primarily responsible for the AA-induced stimulation of muscle protein synthesis
- Can be used alone or with NO7Rage™ and CreatineXXL™ as part of the dotFIT™ "Xtreme Muscle Stack" providing maximum muscle pump and continuous training results for serious exercisers and athletes
- The unique EAA formulation provides for significantly greater muscle gains than traditional protein/CHO post-workout feedings with considerably fewer calories and nitrogen load on the kidneys, providing the greatest "bang for your buck" of any post-workout supplement currently available

Supplement Facts
Serving Size: 15.5 grams (1 scoop)
Servings Per Container: About 34
Calories 0
Calories from Fat 0

Amount Per Serving		**% Daily Value**
Total Fat	**0 g**	**0%**
Saturated Fat	0 g	0%
Trans Fat	0 g	**
Cholesterol	**0 mg**	**0%**
Sodium (as Sodium Chloride)	**19 mg**	**<1%**
Total Carbohydrate	**0 g**	**0%**
Dietary Fiber	0 g	0%
Sugars	0 g	**
Protein	**0 g**	**0%**
AminoBoostXXL™ Proprietary Blend	12 g	**
L-Leucine		**
L-Phenylalanine		**
L-Lysine		**
L-Valine		**
L-Threonine		**
L-Isoleucine		**
L-Histidine		**
L-Methionine		**

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Citric acid, Natural and Artificial flavors, Sucralose, Acesulfame Potassium, Red 40. Soy Lecithin.

References

1 Rennie MJ, Bohé J, Smith K, Wackerhage H, Greenhaff P. Branched-chain amino acids as fuels and anabolic signals in human muscle. J Nutr. 2006 Jan;136(1 Suppl):264S-8S. Review.
2 Yoshizawa F. Regulation of protein synthesis by branched-chain amino acids in vivo. Biochem Biophys Res Commun. 2004 Jan 9;313(2):417-22. Review.
3 Tipton KD, Elliott TA, Cree MG, Aarsland AA, Sanford AP, Wolfe RR. Stimulation of net muscle protein synthesis by whey protein ingestion before and after exercise. Am J Physiol Endocrinol Metab. 2007 Jan;292(1):E71-6. Epub 2006 Aug 8.

4 Tipton KD, Ferrando AA, Phillips SM, Doyle D Jr, Wolfe RR. Postexercise net protein synthesis in human muscle from orally administered amino acids. Am J Physiol. 1999 Apr;276(4 Pt 1):E628-34.
5 Tipton KD, Wolfe RR. Exercise-induced changes in protein metabolism. Acta Physiol Scand. 1998 Mar;162(3):377-87. Review.
6 Garlick PJ. The role of leucine in the regulation of protein metabolism. J Nutr. 2005 Jun;135(6 Suppl):1553S-6S. Review.
7 Katsanos CS, Kobayashi H, Sheffield-Moore M, Aarsland A, Wolfe RR A high proportion of leucine is required for optimal stimulation of the rate of muscle protein synthesis by essential amino acids in the elderly. Am J Physiol Endocrinol Metab. 2006 Aug;291(2):E381-7. Epub 2006 Feb 28.
8 Balage M, Dardevet D. Long-term effects of leucine supplementation on body composition. Curr Opin Clin Nutr Metab Care. 2010 May;13(3):265-70. Review.
9 Beelen M, Burke LM, Gibala MJ, van Loon L JC. Nutritional strategies to promote postexercise recovery. Int J Sport Nutr Exerc Metab. 2010 Dec;20(6):515-32.
10 Vieillevoye S, Poortmans JR, Duchateau J, Carpentier A. Effects of a combined essential amino acids/carbohydrate supplementation on muscle mass, architecture and maximal strength following heavy-load training. Eur J Appl Physiol. 2010 Oct;110(3):479-88. Epub 2010 Jun 3.
11 Bohé J, Low A, Wolfe RR, Rennie MJ. Human muscle protein synthesis is modulated by extracellular, not intramuscular amino acid availability: a dose-response study. J Physiol. 2003 Oct 1;552(Pt 1):315-24. Epub 2003 Aug 8.
12 Glynn EL, Fry CS, Drummond MJ, Dreyer HC, Dhanani S, Volpi E, Rasmussen BB. Muscle protein breakdown has a minor role in the protein anabolic response to essential amino acid and carbohydrate intake following resistance exercise. Am J Physiol Regul Integr Comp Physiol. 2010 Aug;299(2):R533-40. Epub 2010 Jun 2.
13 Moore DR, Robinson MJ, Fry JL, Tang JE, Glover EI, Wilkinson SB, Prior T, Tarnopolsky MA, Phillips SM. Ingested protein dose response of muscle and albumin protein synthesis after resistance exercise in young men. Am J Clin Nutr. 2009 Jan;89(1):161-8. Epub 2008 Dec 3.
14 Kreider RB, Campbell B. Protein for exercise and recovery. Phys Sportsmed. 2009 Jun;37(2):13-21. Review.
15 Cuthbertson D, Smith K, Babraj J, Leese G, Waddell T, Atherton P, Wackerhage H, Taylor PM, Rennie MJ. Anabolic signaling deficits underlie amino acid resistance of wasting, aging muscle. FASEB J. 2005 Mar;19(3):422-4. Epub 2004 Dec 13.
16 Fujita S, Dreyer HC, Drummond MJ, Glynn EL, Cadenas JG, Yoshizawa F, Volpi E, Rasmussen BB. Nutrient signalling in the regulation of human muscle protein synthesis. J Physiol. 2007 Jul 15;582(Pt 2):813-23. Epub 2007 May 3.
17 Atherton PJ, Etheridge T, Watt PW, Wilkinson D, Selby A, Rankin D, Smith K, Rennie MJ. Muscle full effect after oral protein: time-dependent concordance and discordance between human muscle protein synthesis and mTORC1 signaling. Am J Clin Nutr. 2010 Nov;92(5):1080-8. Epub 2010 Sep 15.
18 Spruce, Neal F., and Alan C. Titchenal. "Other Individual Amino Acids." Sports Nutrition Fats and Proteins. Judy A. Hillsdale. Boca Raton, FL: CRC Press, 2007. 279-333. Print.
19 Gropper, S.S., Smith, J.L. and Groff, J.L. Advanced Nutrition and Human Metabolism, 4th ed., Wadsworth, Belmont, 2005, pp. 205-206.
20 van Loon LJ, Saris WH, Verhagen H, Wagenmakers AJ. Plasma insulin responses after ingestion of different amino acid or protein mixtures with carbohydrate. Am J Clin Nutr. 2000 Jul;72(1):96-105.
21 van Loon LJ, Saris WH, Kruijshoop M, Wagenmakers AJ. Maximizing postexercise muscle glycogen synthesis: carbohydrate supplementation and the application of amino acid or protein hydrolysate mixtures. Am J Clin Nutr. 2000 Jul;72(1):106-11.
22 Whitney EN, Rolfes SR, editors. Understanding Nutrition. 7th Ed. Minneapolis/St. Paul: West Publishing; 1996. 1694 p. pp 197- 226.
23 Flodin NW. The metabolic roles, pharmacology, and toxicology of lysine. J Am Coll Nutr. 1997 Feb;16(1):7-21.
24 Hall SL, Greendale GA. The relation of dietary vitamin C intake to bone mineral density: results from the PEPI study. Calcif Tissue Int. 1998 Sep;63(3):183-9.
25 Linder, Maria C. Nutritional Biochemistry and Metabolism, 2nd Edition. New York: Elsevier, 1991. Pg 93.
26 [No authors listed] Energy and protein requirements. Report of a joint FAO/WHO/UNU Expert Consultation. World Health Organ Tech Rep Ser. 1985;724:1-206.

27 Borgonha S, Regan MM, Oh SH, Condon M, Young VR. Threonine requirement of healthy adults, derived

with a 24-h indicator amino acid balance technique. Am J Clin Nutr. 2002 Apr;75(4):698-704.
28 Kurpad AV, Raj T, Regan MM, Vasudevan J, Caszo B, Nazareth D, Gnanou J, Young VR. Threonine requirements of healthy Indian men, measured by a 24-h indicator amino acid oxidation and balance technique. Am J Clin Nutr. 2002 Oct;76(4):789-97.
29 [No authors listed] Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (Macronutrients). Institute of Medicine. Food and Nutrition Board (FNB). Office of Disease Prevention and Health Promotion of the U.S. Department of Health and Human Services. 2005. P. 27. www.nap.edu.
30 Kriengsinyos W, Rafii M, Wykes LJ, Ball RO, Pencharz PB. Long-term effects of histidine depletion on whole-body protein metabolism in healthy adults. J Nutr. 2002 Nov;132(11):3340-8.
31 Johnson P, Hammer JL. Histidine dipeptide levels in ageing and hypertensive rat skeletal and cardiac muscles. Comp Biochem Physiol B. 1992 Dec;103(4):981-4.
32 Guiotto A, Calderan A, Ruzza P, Borin G. Carnosine and carnosine-related antioxidants: a review. Curr Med Chem. 2005;12(20):2293-315. Review.
33 Begum G, Cunliffe A, Leveritt M. Physiological role of carnosine in contracting muscle. Int J Sport Nutr Exerc Metab. 2005 Oct;15(5):493-514. Review.
34 Kraemer WJ, Gordon SE, Lynch JM, Pop ME, Clark KL. Effects of multibuffer supplementation on acid-base balance and 2,3-diphosphoglycerate following repetitive anaerobic exercise. Int J Sport Nutr. 1995 Dec;5(4):300-14.
35 Suzuki Y, Nakao T, Maemura H, Sato M, Kamahara K, Morimatsu F, Takamatsu K. Carnosine and anserine ingestion enhances contribution of nonbicarbonate buffering. Med Sci Sports Exerc. 2006 Feb;38(2):334-8.
36 Suzuki Y, Ito O, Mukai N, Takahashi H, Takamatsu K. High level of skeletal muscle carnosine contributes to the latter half of exercise performance during 30-s maximal cycle ergometer sprinting. Jpn J Physiol. 2002 Apr; 52 (2):199-205.
37 Fukagawa NK, Galbraith RA. Advancing age and other factors influencing the balance between amino acid requirements and toxicity. J Nutr. 2004 Jun;134(6 Suppl):1569S-1574S.
38 Trimble KC, Molloy AM, Scott JM, Weir DG. The effect of ethanol on one-carbon metabolism: increased methionine catabolism and lipotrope methyl-group wastage. Hepatology. 1993 Oct;18(4):984-9.
39 Duranton B, Freund JN, Galluser M, Schleiffer R, Gosse F, Bergmann C, Hasselmann M, Raul F. Promotion of intestinal carcinogenesis by dietary methionine. Carcinogenesis. 1999 Mar;20(3):493-7.
40 Humm A, Fritsche E, Steinbacher S, Huber R. Crystal structure and mechanism of human L-arginine:glycine amidinotransferase: a mitochondrial enzyme involved in creatine biosynthesis. EMBO J. 1997 Jun 16;16(12):3373-85.
41 Vaz FM, Wanders RJ. Carnitine biosynthesis in mammals. Biochem J. 2002 Feb 1;361(Pt 3):417-29. Review.
42 Storch KJ, Wagner DA, Burke JF, Young VR. [1-13C; methyl-2H3]methionine kinetics in humans: methionine conservation and cystine sparing. Am J Physiol. 1990 May;258(5 Pt 1):E790-8.
43 Storch KJ, Wagner DA, Burke JF, Young VR. Quantitative study in vivo of methionine cycle in humans using [methyl-2H3]- and [1-13C]methionine. Am J Physiol. 1988 Sep;255(3 Pt 1):E322-31.
44 Kien CL, Young VR, Rohrbaugh DK, Burke JF. Increased rates of whole body protein synthesis and breakdown in children recovering from burns. Ann Surg. 1978 Apr;187(4):383-91.
45 Yoshida, A. & Moritoki, K. Nitrogen sparing action of methionine and threonine in rats receiving a protein free diet. Nutrition Reports International. 1974: 9, 159-168.
46 Millward DJ, Rivers JP. The need for indispensable amino acids: the concept of the anabolic drive. Diabetes Metab Rev. 1989 Mar;5(2):191-211. Review.
47 Yokogoshi H, Yoshida A. Some factors affecting the nitrogen sparing action of methionine and threonine in rats fed a protein free diet. J Nutr. 1976 Jan;106(1):48-57.
48 "Safety Information." 2006. Food and Drug Administration. http://www.fda.gov/medwatch/.
49 Garret RH, Grisham CM. Biochemistry, 3rd Edition. Belmont, CA: Thomson Brooks/Cole, 2005.
50 Garlick PJ. The nature of human hazards associated with excessive intake of amino acids. J Nutr. 2004 Jun;134(6 Suppl):1633S-1639S; discussion 1664S-1666S, 1667S-1672S. Review.
51 Tang FC. Influence of branched-chain amino acid supplementation on urinary protein metabolite concentrations after swimming. J Am Coll Nutr. 2006 Jun;25(3):188-94.
52 Lukkarinen M, Nanto-Salonen K, Pulkki K, Aalto M, Simell O. Oral supplementation corrects plasma lysine concentrations in lysinuric protein intolerance. Metabolism. 2003 Jul;52(7):935-8.
53 Corpas E, Blackman MR, Roberson R, Scholfield D, Harman SM. Oral arginine-lysine does not increase

growth hormone or insulin-like growth factor-I in old men. J Gerontol. 1993 Jul;48(4):M128-33.
54 Cottington EM, LaMantia C, Stabler SP, Allen RH, Tangerman A, Wagner C, Zeisel SH, Mudd SH. Adverse event associated with methionine loading test: a case report. Arterioscler Thromb Vasc Biol. 2002 Jun 1;22(6):1046-50.
55 Smilkstein MJ, Knapp GL, Kulig KW, Rumack BH. Efficacy of oral N-acetylcysteine in the treatment of acetaminophen overdose. Analysis of the national multicenter study (1976 to 1985) N Engl J Med. 1988 Dec 15;319(24):1557-62.
56 Graham IM, Daly LE, Refsum HM, Robinson K, Brattstrom LE, Ueland PM, Palma-Reis RJ, Boers GH, Sheahan RG, Israelsson B, Uiterwaal CS, Meleady R, McMaster D, Verhoef P, Witteman J, Rubba P, Bellet H, Wautrecht JC, de Valk HW, Sales Luis AC, Parrot-Rouland FM, Tan KS, Higgins I, Garcon D, Andria G, et al. Plasma homocysteine as a risk factor for vascular disease. The European Concerted Action Project. JAMA. 1997 Jun 11;277(22):1775-81.
57 Garlick P. Toxicity of methionine in humans. J Nutr. 2006 Jun;136(6 Suppl):1722S-1725S. Review.
58 Fukagawa NK, Galbraith RA. Advancing age and other factors influencing the balance between amino acid requirements and toxicity. J Nutr. 2004 Jun;134(6 Suppl):1569S-1574S.
59 Trimble KC, Molloy AM, Scott JM, Weir DG. The effect of ethanol on one-carbon metabolism: increased methionine catabolism and lipotrope methyl-group wastage. Hepatology. 1993 Oct;18(4):984-9.
60 Gerber DA, Tanenbaum L, Ahrens M. Free serum histidine levels in patients with rheumatoid arthritis and control subjects following an oral load of free L-histidine. Metabolism. 1976 Jun;25(6):655-7.
61 Geliebter AA, Hashim SA, Van Itallie TB. Oral L-histidine fails to reduce taste and smell acuity but induces anorexia and urinary zinc excretion. Am J Clin Nutr. 1981 Jan;34(1):119-20.
62 Hauser SL, Doolittle TH, Lopez-Bresnahan M, Shahani B, Schoenfeld D, Shih VE, Growdon J, Lehrich JR. An antispasticity effect of threonine in multiple sclerosis. Arch Neurol. 1992 Sep;49(9):923-6.
63 Camacho F, Mazuecos J. Oral and topical L-phenylalanine, clobetasol propionate, and UVA/sunlight--a new study for the treatment of vitiligo. J Drugs Dermatol. 2002 Sep;1(2):127-31.
64 Tipton KD, Ferrando AA, Phillips SM, Doyle DJ, Wolfe RR. Postexercise net protein synthesis in human muscle from orally administered amino acids. Am J Physiol 1999;276:E628-34
65 Borsheim E, Tipton KD, Wolf SE, Wolfe RR. Essential amino acids and muscle protein recovery from resistance exercise. Am J Physiol Endocrinol Metab 2002;283:E648
66 Mansoor O, Breuille D, Bechereau F, Buffiere C, Pouyet C, Beaufrere B, Vuichoud J, Van't-Of M, Obled C. Effect of an enteral diet supplemented with a specific blend of amino acid on plasma and muscle protein synthesis in ICU patients. Clin Nutr. 2006 Sep 21.
67 21 CFR Chpt I 172.320: http://a257.g.akamaitech.net/7/257/2422/10apr20061500/edocket.access.gpo.gov/cfr_2006/aprqtr/pdf/21cfr172.320.pdf Accessed 11-07-06.

NO7Rage™

Goal

The goal of this product is to provide specific compounds that have the ability to enhance blood and nutrient flow to exercising muscles in order to amplify the training response. NO7Rage includes ingredients shown to improve reaction time, endurance and force production. In order to improve training desire and focus, NO7Rage contains compounds that in clinical trials have demonstrated positive cognitive effects. All together this product has the ability, through multiple pathways, to significantly enhance strength, performance and size training outcomes when compared to similar products or a non-supplemented state. See Appendix 3: *Xtreme Muscle Stack: Creating the Perfect Anabolic Storm.*

Rationale

NO7Rage contains a proprietary blend of compounds that work synergistically to increase blood flow (vasodilatation), cell volumization, protein synthesis and mental focus. Greater blood flow to skeletal muscle would increase the delivery of oxygen, energy and rebuilding nutrients while speeding up the removal of waste products. This leads to a potential strength improvement, less muscle breakdown and greater net protein synthesis, especially if combined with an appropriate "dose and timed" delivery of specific amino acids (AminoBoostXXL™).

L-Citrulline: Arginine is the primary amino acid found in most nitric oxide-producing (NO) supplements.[1] It has been shown to be involved in the production of NO[2,3,4,5,6] and creatine biosynthesis,[7] yet when used orally, arginine is subjected to substantial intestinal and liver metabolism by arginase.[8,9,10,11] This makes L-arginine virtually ineffective at increasing NO production. L-citrulline, a ubiquitous non-protein amino acid, is not metabolized in the intestines or liver and does not promote arginase activity.[9] The body readily converts L-citrulline to L-arginine, raising plasma and tissue levels of L-arginine thus leading to enhanced NO production (see Figure 7: Metabolic Pathway for NO production).[9,10,12]

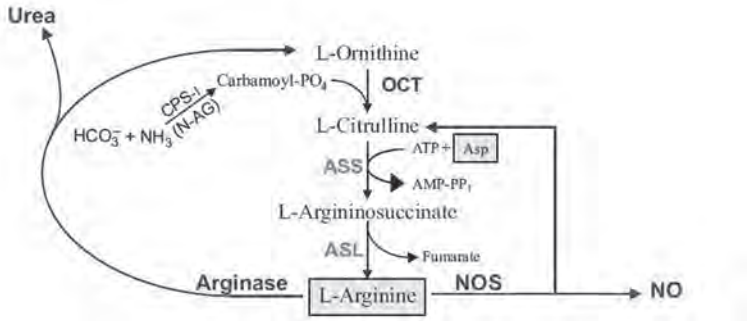

FIG. 6 Scheme of synthesis of carbamoyl-PO4 and the incorporation of NH_3 into the urea cycle. Abbreviations: CPS-I, carbamoyl PO_4 synthase I; N-AG, *N*-acetylglutamate.

Figure 7: Metabolic Pathway for NO production.

Creatine monohydrate: See CreatineMonohydrate.

Beta-alanine (see CreatineXXL for complete data on beta-alanine): This ingredient has been added to the new NO7Rage because recently beta-alanine supplementation, compared to placebos, has been shown to improve exercise-induced lean body mass[13,14] and endurance performance[14] training volume while reducing feelings of fatigue,[15] sprint performance in endurance cycling,[16] and improve muscle endurance in the elderly.[17] All together beta-alanine supplementation at the proper dosages appears to a very safe[18] and effective ergogenic aid.[19,20]

Beta PEA-Phenylethylamine (PEA) is an alkaloid, which is a naturally occurring chemical compound, and a monoamine, which is a neurotransmitter found in the brain. Neurotransmitters help send and receive signals in the brain. Phenylethylamine helps produce hormones that create positive feelings. It is most commonly found in chocolate and is associated with the satisfied/positive mood feelings one experiences after consuming chocolate. PEA is added for its mood-enhancing potential.[21]

Palatinose: Palatinose™ (Isomaltulose) is the only low glycemic carbohydrate providing longer lasting

energy in the form of glucose. Hydrolysis and absorption in the body is complete but much slower compared to sucrose and other sugars (See LeanMR for all referenced data).

Glucuronolactone, caffeine and taurine in combination have been shown to have numerous positive effects including increased mental focus, reaction time and physical endurance.[22,23,24,25] This is accomplished through various mechanisms including stimulation of the central nervous system,[26] regulation of neurotransmitters in the brain, and alterations in calcium levels within muscle thus increasing activation.[27,28] Taurine supplementation studies continue to yield positive results related to muscle function, recovery and endurance performance.[29,30] Also see Workout Extreme for more on Taurine and Caffeine as they relate to improving performance.

Glycerol may enhance fluid retention within the body, which leads to greater volumization and pump within the exercising muscles.[31,32,33,34,35]

Pine Bark (Pycnogenol) has been added because of its antioxidant benefits and beneficial effects on circulation, primarily through its effects on nitric oxide, a chemical that stimulates dilation of the blood vessels.[36,37,38,39]

AstaReal: AstaREAL® astaxanthin is the most studied brand of astaxanthin in the world for applications such as muscle endurance, eye fatigue, diabetes type 2, gastric health and more.[40] AstaREAL® is derived from *Haematococcus pluvialis*. H. pluvialis is the leading source of natural astaxanthin in more than 300 peer reviewed research publications. All physical activity will generate free radicals, the more intense the activity the greater number of free radicals. Free radicals are shown to have damaging effects on muscle performance and recovery. Published and on-going research, focused on improving endurance and reducing recovery time, is showing dramatic benefits linked astaxanthin.

Astaxanthin supplementation has been shown to increase endurance and reduce muscle damage: In one study, it was demonstrated that astaxanthin may modify muscle metabolism by its antioxidant properties and result in improved muscle performance and weight loss benefits.[41] Another study involving 1200 meter track athletes using astaxanthin demonstrated, that a daily dose of 6 mg per day for 4 weeks resulted in their bodies accumulating lower levels of lactic acid.[40] Ikeuchi et al. also reported the same findings and that astaxanthin efficacy had a dose-dependent response.[42]

Typical Use

- As an aid for intermediate and advanced anaerobic athletes to enhance size and strength gains from exercise
- Performance athletes not affected by weight gain (must self-determine)
- All experienced, aspiring and competitive bodybuilders and other anaerobic athletes attempting to increase muscle size and strength
- Incorporate with AminoBoostXXL™ and CreatineXXL™ as part of the dotFIT™ "Xtreme Muscle Stack" to provide maximum muscle pump and continuous training results for serious exercisers and athletes

Dosage

- Thirty to 40 minutes before workout
- Under 150 lbs. take 1.5 scoops
- 150-200 lbs. take 2 scoops
- 200 lbs. plus take 2.5 scoops
- Not necessary on non-workout days if using other products containing creatine; otherwise use half of recommended dose on non-training days
- Do not exceed 3 scoops (primarily due to caffeine content)

Precautions

NO7Rage™ contains caffeine, which is a CNS stimulant and should be avoided by those sensitive to its effects. NO7Rage is otherwise a well-tolerated, ephedrine-free ergogenic aid.

Contraindications
NO7Rage supplementation is contraindicated in pregnancy and lactation because of the CNS stimulant (caffeine). Caffeine can interfere with some medications such as lithium and MAO inhibitors. Caffeine is contraindicated in those with cardiac arrhythmias, other forms of heart disease, hyperthyroidism and peptic ulcers. Creatine is contraindicated for those with kidney problems because of potentially greater kidney stress.

Do not use if
- Using other products containing high doses of caffeine or are caffeine sensitive
- Using erectile dysfunction drugs
- Individual has a heart condition or is using related medications
- Taking medication for hypothyroidism

Adverse Reactions
Large doses of caffeine may result in diuresis (usually in non-users) and insomnia when taken late in the day. Numerous studies on the safety of caffeine exist. Caffeine misuse can cause tension, anxiety, excitability and restlessness at doses over 400 mg at once. Doses over 1000 mg at once can induce toxicity symptoms. Adverse effects due to high amounts of caffeine are not likely to be seen at the recommended dose of NO7Rage. Individuals sensitive to caffeine may wish to start with a low dose and work up to the recommended dose.

Glycerol: Even at doses up to 1 g/kg, glycerol is considered well tolerated, with a few incidences in clinical trials of gastrointestinal upset, nausea, vomiting, dizziness and bloating.[43] The dose of glycerol in NO7Rage is much lower, making such adverse events improbable.

Citrulline: No adverse reactions have been reported in doses up to 6 grams of citrulline malate.[44]

Creatine: See dotFIT™ CreatineMonohydrate.

PEA & Astaxanthine: no adverse reactions have been reported at the recommended doses.

Pine Bark (Pycnogenol) has been safely used in oral doses of 50-450 mg daily for up to 6 months.[39]

Beta-alanine no adverse events at recommended dose (see CreatineXXL for more data).

Glucuronolactone: Glucuronolactone is a substance found in many caffeine and taurine containing energy drinks at doses of 500 mg or more per drink. It is considered safe and well-tolerated in these beverages.[22,45]

Taurine: Taurine is an amino acid naturally present in many foods, especially meats and fish. It has been combined with caffeine in several beverage studies with no adverse events reported except in one study where a mild increase in mean arterial blood pressure (2.8 mm Hg average) and an eight-beat-per minute reduction in heart rate were shown.[46,47,48] Taurine is used for congestive heart failure at higher doses from two to six grams daily to help increase stroke volume with few side effects such as mild diarrhea.[49] It is also used for other disease states such as hepatitis and cardiac arrhythmias where doses from 12 to 20 grams daily were used.[49] Mild diarrhea was reported in a few subjects in the heart failure studies.

Upper Limit/Toxicity
Doses of caffeine should not exceed 1000 mg/day, leaving the dose in NO7Rage at a safe level.

Taurine: Taurine has an LD50 in rats of greater than 64g/kg580 and is present in the human, which

suggests it is quite safe in this product.

Citrulline: The LD50 is not available at this time.

Glycerol: The LD50 for Glycerol is 12.6 g/kg.582.

Vitamin B6: B6 has a UL of 100 mg. Even when this product is combined with a dotFIT™ multivitamin and a typical diet, the total daily dose is well below the UL.

Vitamin B12: B12 has no UL, NOAEL or LOAEL; therefore, when this product is combined with a dotFIT™ multivitamin and a typical diet, the total daily dose is regarded as safe.

The upper limit (UL) for Vitamin E is 1500 IU; even when this product is combined with a dotFIT multivitamin and a typical diet, the total daily dose is well below the UL.

The upper limit (UL) for Vitamin C is 2000 mg, even when this product is combined with a dotFIT multivitamin and a typical diet, the total daily dose is well below the UL.

Summary

Purpose

- NO7Rage™ by itself can be a weight (muscle) gain product for intermediate/advance exercisers and athletes seeking an advantage during high intensity, high-volume training regimes
- NO7Rage can be used in combination with other performance products in order to amplify their effects, especially to overcome training and muscle size plateaus
- Based on NO7Rage's stimulatory and positive cognitive effects (mood enhancement), NO7Rage can stimulate your training desire while increasing workout intensity
- NO7Rage is incorporated into the dotFIT software dietary supplement recommendations as part of the muscle gain/performance recommendation for all intermediate/advanced athletes and exercisers who choose anaerobic performance/muscle gain as the primary goal
- Those concerned with weight/muscle gain as a possible hindrance to performance may prefer not to use NO7Rage and may seek other performance recommendations suggested by dotFIT

Unique Features

- Contains L-citrulline which has been shown to be a more effective substrate for inducing NO production
- Contains a unique, proprietary blend of taurine, glycerol and Pine Bark to enhance the pump during resistance training workouts
- Includes a blend of glycerol powder that is exclusive to dotFIT's manufacturer and may be the most important active ingredient related to the desired "pump" outcome
- The flavor supplied by the manufacturer will be proprietary and hopefully appeal to a greater portion of users than existing products
- Can be used alone or with AminoBoostXXL™ and CreatineXXL™ as part of the dotFIT "Xtreme Muscle Stack" providing maximum muscle pump and continuous training results for serious exercisers and athletes
- Dosage instructions will be far more accurate per individual

Supplement Facts

Serving Size 1 scoop (22 grams)
Servings Per Container 40

	Amount Per Serving	% DV
Calories	**35**	
Total Carbohydrate	**9 g**	**3%**
Sugars	7 g	**
Vitamin C (as Ascorbic Acid)	250 mg	416%
Vitamin E (as D-Alpha-Tocopheryl Acetate)	30 IU	100%
Potassium (as Citrate and Carbonate)	300 mg	9%
Sodium (as Sodium Chloride)	120 mg	5%
Energy Complex	7,903 mg	**
Isomaltulose (Palatinose)		**
Phenylethylamine hydrochloride (Thin FenBeta PEA)		**
NO7Rage™ Proprietary Blend	3,913 mg	**
Glycerol Powder		**
L-Citrulline L-Malate (Citral M)		**
Beta Alanine (Carnosyn)		**
Pine Bark (85% Proanthocyanidins)		**
Alpha Lipoic Acid		**
Astaxanthin (AstaREAL®)		**
Creatine Monohydrate	2,500 mg	**
Taurine	2,000 mg	**
Glucuronolactone	400 mg	**
Caffeine Anhydrous	175 mg	**

*Percent Daily Values are based on a 2,000 calorie diet.
** % Daily Value not established.

Other Ingredients: Silica, citric acid, malic acid, natural and artificial flavors, sucralose, carmine powder (color).

References

1 Campbell BI, La Bounty PM, Roberts M. The ergogenic potential of arginine. J Int Soc Sports Nutr. 2004 Dec 31;1(2):35-8.
2 Appleton J. Arginine: Clinical potential of a semi-essential amino. Altern Med Rev. 2002 Dec;7(6):512-22. Review.
3 Marechal G, Gailly P. Effects of nitric oxide on the contraction of skeletal muscle. Cell Mol Life Sci. 1999 Jul;55(8-9):1088-102. Review.
4 Stamler JS, Meissner G. Physiology of nitric oxide in skeletal muscle. Physiol Rev. 2001 Jan;81(1):209-237. Review.
5 Jobgen WS, Fried SK, Fu WJ, Meininger CJ, Wu G. Regulatory role for the arginine-nitric oxide pathway in metabolism of energy substrates. J Nutr Biochem. 2006 Sep;17(9):571-88. Epub 2006 Jan 9. Review.
6 Cylwik D, Mogielnicki A, Buczko W. L-arginine and cardiovascular system. Pharmacol Rep. 2005 Jan-Feb;57(1):14-22. Review.
7 Paddon-Jones D, Børsheim E, Wolfe RR. Potential ergogenic effects of arginine and creatine supplementation. J Nutr. 2004 Oct;134(10 Suppl):2888S-2894S; discussion 2895S. Review.
8 Morris SM Jr. Regulation of enzymes of urea and arginine synthesis. Annu Rev Nutr. 1992;12:81-101. Review.
9 Romero MJ, Platt DH, Caldwell RB, Caldwell RW. Therapeutic use of citrulline in cardiovascular disease. Cardiovasc Drug Rev. 2006 Fall-Winter;24(3-4):275-90. Review.
10 Socha HM, Romero MJ, Caldwell RB, Caldwell RW. Oral citrulline administration enhances NO-dependent vasodilation. FASEB Exp Biol 2006;Abs 703.4.
11 van de Poll MC, Soeters PB, Deutz NE, Fearon KC, Dejong CH. Renal metabolism of amino acids: its role in interorgan amino acid exchange. Am J Clin Nutr. 2004 Feb;79(2):185-97. Review.
12 Sureda A, Cordova A, Ferrer MD, Tauler P, Perez G, Tur JA, Pons A. Effects of L-citrulline oral supplementation on polymorphonuclear neutrophils oxidative burst and nitric oxide production after exercise. Free Radic Res. 2009 Sep;43(9):828-35. Epub 2009 Jul 6.
13 Walter AA, Smith AE, Kendall KL, Stout JR, Cramer JT. Six weeks of high-intensity interval training with and without beta-alanine supplementation for improving cardiovascular fitness in women. J Strength Cond Res. 2010 May;24(5):1199-207.

14 Smith AE, Walter AA, Graef JL, Kendall KL, Moon JR, Lockwood CM, Fukuda DH, Beck TW, Cramer JT, Stout JR. Effects of beta-alanine supplementation and high-intensity interval training on endurance per-

formance and body composition in men; a double-blind trial. J Int Soc Sports Nutr. 2009 Feb 11;6:5.
15 Hoffman JR, Ratamess NA, Faigenbaum AD, Ross R, Kang J, Stout JR, Wise JA. Short-duration beta-alanine supplementation increases training volume and reduces subjective feelings of fatigue in college football players. Nutr Res. 2008 Jan;28(1):31-5.
16 Van Thienen R, Van Proeyen K, Vanden Eynde B, Puype J, Lefere T, Hespel P. Beta-alanine improves sprint performance in endurance cycling. Med Sci Sports Exerc. 2009 Apr;41(4):898-903.
17 Stout JR, Graves BS, Smith AE, Hartman MJ, Cramer JT, Beck TW, Harris RC. The effect of beta-alanine supplementation on neuromuscular fatigue in elderly (55-92 Years): a double-blind randomized study. J Int Soc Sports Nutr. 2008 Nov 7;5:21.
18 Artioli GG, Gualano B, Smith A, Stout J, Lancha AH Jr. Role of beta-alanine supplementation on muscle carnosine and exercise performance. Med Sci Sports Exerc. 2010 Jun;42(6):1162-73. Review.
19 Derave W, Everaert I, Beeckman S, Baguet A. Muscle carnosine metabolism and beta-alanine supplementation in relation to exercise and training. Sports Med. 2010 Mar 1;40(3):247-63. doi: 10.2165/11530310-000000000-00000. Review.
20 Sale C, Saunders B, Harris RC Effect of beta-alanine supplementation on muscle carnosine concentrations and exercise performance. Amino Acids. 2010 Jul;39(2):321-33. Epub 2009 Dec 20. Review.
21 Sabelli H, Fink P, Fawcett J, Tom C. Sustained antidepressant effect of PEA replacement. J Neuropsychiatry Clin Neurosci. 1996 Spring;8(2):168-71.
22 Alford C, Cox H, Wescott R. The effects of red bull energy drink on human performance and mood. Amino Acids. 2001;21(2):139-50.
23 Forbes SC, Candow DG, Little JP, Magnus C, Chilibeck PD. Effect of Red Bull energy drink on repeated Wingate cycle performance and bench-press muscle endurance. Int J Sport Nutr Exerc Metab. 2007 Oct;17(5):433-44.
24 Beck TW, Housh TJ, Schmidt RJ, Johnson GO, Housh DJ, Coburn JW, Malek MH. The acute effects of a caffeine-containing supplement on strength, muscular endurance, and anaerobic capabilities. J Strength Cond Res. 2006 Aug;20(3):506-10.
25 Mets MA, Ketzer S, Blom C, van Gerven MH, van Willigenburg GM, Olivier B, Verster JC. Positive effects of Red Bull® Energy Drink on driving performance during prolonged driving. Psychopharmacology (Berl). 2010 Nov 10. [Epub ahead of print]
26 Spriet LL, Gibala MJ. Nutritional strategies to influence adaptations to training. J Sports Sci. 2004 Jan;22(1):127-41. Review.
27 Graham TE. Caffeine and exercise: metabolism, endurance and performance. Sports Med. 2001;31(11):785-807. Review.
28 Sökmen B, Armstrong LE, Kraemer WJ, Casa DJ, Dias JC, Judelson DA, Maresh CM. Caffeine use in sports: considerations for the athlete. J Strength Cond Res. 2008 May;22(3):978-86. Review.
29 Imagawa TF, Hirano I, Utsuki K, Horie M, Naka A, Matsumoto K, Imagawa S. Caffeine and taurine enhance endurance performance. Int J Sports Med. 2009 Jul;30(7):485-8. Epub 2009 May 19.
30 Goodman CA, Horvath D, Stathis C, Mori T, Croft K, Murphy RM, Hayes A. Taurine supplementation increases skeletal muscle force production and protects muscle function during and after high-frequency in vitro stimulation. J Appl Physiol. 2009 Jul;107(1):144-54. Epub 2009 May 7.
31 Coutts A, Reaburn P, Mummery K, Holmes M. The effect of glycerol hyperhydration on Olympic distance triathlon performance in high ambient temperatures. Int J Sport Nutr Exerc Metab. 2002 Mar;12(1):105-19.
32 Nelson JL, Robergs RA. Exploring the potential ergogenic effects of glycerol hyperhydration. Sports Med. 2007;37(11):981-1000. Review.
33 O'Brien C, Freund BJ, Young AJ, Sawka MN. Glycerol hyperhydration: physiological responses during cold-air exposure. J Appl Physiol. 2005 Aug;99(2):515-21. Epub 2005 Apr 7.
34 van Rosendal SP, Osborne MA, Fassett RG, Coombes JS. Guidelines for glycerol use in hyperhydration and rehydration associated with exercise. Sports Med. 2010 Feb 1;40(2):113-29. doi: 10.2165/11530760-000000000-00000. Review.
35 Goulet ED. Glycerol-induced hyperhydration: a method for estimating the optimal load of fluid to be ingested before exercise to maximize endurance performance. J Strength Cond Res. 2010 Jan;24(1):74-8.
36 Maimoona A, Naeem I, Saddiqe Z, Jameel K. A review on biological, nutraceutical and clinical aspects of French maritime pine bark extract. J Ethnopharmacol. 2010 Oct 31. [Epub ahead of print]

37 Cesarone MR, Belcaro G, Rohdewald P, Pellegrini L, Ledda A, Vinciguerra G, Ricci A, Ippolito E, Fano F, Dugall M, Cacchio M, Di Renzo A, Hosoi M, Stuard S, Corsi M. Improvement of signs and symptoms of

chronic venous insufficiency and microangiopathy with Pycnogenol: a prospective, controlled study. Phytomedicine. 2010 Sep;17(11):835-9. Epub 2010 Jun 25.
38 Grossi MG, Belcaro G, Cesarone MR, Dugall M, Hosoi M, Cacchio M, Ippolito E, Bavera P. Improvement in cochlear flow with Pycnogenol® in patients with tinnitus: a pilot evaluation. Panminerva Med. 2010 Jun;52(2 Suppl 1):63-7.
39 Pycnogenol. 1995-2011. Natural Medicines Comprehensive Database. 2011. http://naturaldatabase.therapeuticresearch.com/nd/Search.aspx?cs=&s=ND&pt=9&Product=pycnogenol&btnSearch.x=0&btnSearch.y=0
40 Sawaki, K. et al. (2002) Sports performance benefits from taking natural astaxanthin characterized by visual activity and muscle fatigue improvements in humans. Journal of Clinical Therapeutics & Medicine 18(9):73-88.
41 Aoi, W et al. (2008) Astaxanthin improves muscle lipid metabolism in exercise via inhibitory effect of oxidative CPT I modification. Biochem., Biophys. Res. Com. 366 (2008) 892–897.
42 Ikeuchi M, Koyama T, Takahashi J, Yazawa K., Effects of astaxanthin supplementation on exercise-induced fatigue in mice., Biol Pharm Bull. 2006 Oct;29(10):2106-10.
43 Wagner DR. Hyperhydrating with glycerol: implications for athletic performance. J Am Diet Assoc. 1999 Feb;99(2):207-12. Review.
44 Bendahan D, Mattei JP, Ghattas B, Confort-Gouny S, Le Guern ME, Cozzone PJ. Citrulline/malate promotes aerobic energy production in human exercising muscle. Br J Sports Med. 2002 Aug;36(4):282-9.
45 Horne JA, Reyner LA. Beneficial effects of an "energy drink" given to sleepy drivers. Amino Acids. 2001;20(1):83-9.
46 Bichler A, Swenson A, Harris MA. A combination of caffeine and taurine has no effect on short term memory but induces changes in heart rate and mean arterial blood pressure. Amino Acids. 2006 May 15; [Epub ahead of print]
47 Seidl R, Peyrl A, Nicham R, Hauser E. A taurine and caffeine-containing drink stimulates cognitive performance and well-being. Amino Acids. 2000;19(3-4):635-42.
48 Warburton DM, Bersellini E, Sweeney E. An evaluation of a caffeinated taurine drink on mood, memory and information processing in healthy volunteers without caffeine abstinence. Psychopharmacology (Berl). 2001 Nov;158(3):322-8.
49 Eby G, Halcomb WW. Elimination of cardiac arrhythmias using oral taurine with l-arginine with case histories: Hypothesis for nitric oxide stabilization of the sinus node. Med Hypotheses. 2006;67(5):1200-4. Epub 2006 Jun 23.

MuscleDefender™

Goal

This product is designed to aid in recovery from prolonged, exhaustive exercise by 1) increasing muscle protein synthesis (MPS); 2) promoting glycogen synthesis; and 3) supporting the immune system. The goal of MuscleDefender is to supply L-Glutamine peptides in a new, patented, stable form to increase blood and muscle glutamine levels that are depleted due to prolonged exercise bouts and/or overtraining, thus allowing the exerciser or athlete to maintain their frequency and intensity of training cycles.

Rationale

Glutamine is one of the most abundant and versatile amino acids (AA) found in the human body, comprising roughly 50% of the free AA pool in the blood and skeletal muscle.[1,2,3] It is involved in several regulatory processes such as acid-base homeostasis, synthesis of body proteins, and serves as an energy-yielding substrate (gluconeogenesis).[4,5] Skeletal muscle is the most active tissue for glutamine metabolism, which can be depleted during times of exhaustive or prolonged exercise bouts (e.g. endurance, triathlon events, etc.).[3] Research has shown that decreased muscle glutamine pools can result in greater catabolism of muscle protein.[6] Supplemental glutamine has been found to increase MPS immediately after exhaustive exercise.[7,8] Glutamine is considered a gluconeogenic amino acid, donating its carbon skeleton for glucose synthesis. This could decrease amino acid release from muscle pools leading to faster recovery following exercise. Additionally, from endurance exercise studies, overtraining can lower plasma and muscle glutamine levels,[9] leading to suppression of the immune system.[4,10] This could result in an increase in upper-respiratory tract infections and a decrease in training volume and intensity. Published research has shown glutamine supplementation to boost the response time of immune cells, thus allowing the athlete to sustain greater frequency and intensity of training.[7,11,12,13]

In a recent review titled "The Effect Physical Activity on Glutamine Metabolism," it was determined that after exercise, a reduced glutamine availability may be considered as a marker of overtraining. Increased glutamine availability may contribute to decreased inflammation and health benefits associated with optimal training. Thus, glutamine supplementation may enhance immunocompetence after strenuous exercise.[14]

MuscleDefender utilizes a patented stabilized form of L-Glutamine that has been demonstrated to elevate plasma and muscle glutamine levels after ingesting; levels then remain elevated above baseline for at least 90 minutes (see Figure 8).

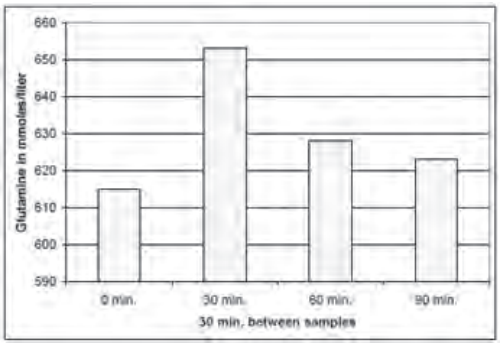

Figure 8: Plasma glutamine levels

Typical Use

- Highly stressed, calorie-restricted athletes, such as in-season bodybuilders
- Endurance athletes with frequent and heavy training loads
- Athletes and exercisers with a large calorie deficit for fat loss
- Any athlete susceptible to over-training due to excessive workloads and/or suboptimal recovery status

- The dose most likely to suggest benefit is five to 20 g/day in five gram doses throughout the day
- MuscleDefender should be taken several hours before or after a meal to prevent interaction with other amino acids in the regular diet

Precautions

Individuals with kidney or liver disease are contraindicated for MuscleDefender given the central role these organs play in glutamine metabolism.[1]

Contraindications

Glutamine supplementation is contraindicated in those with kidney problems or at risk for kidney disease because of possible increased kidney stress. Glutamine supplementation should be avoided by pregnant or lactating women because of the lack of studies done with this population. Glutamine supplementation should not be employed by children and adolescents due to limited data.

Adverse Reactions

Doses up to 40 grams/day of glutamine supplementation have not shown any significant adverse effects.[15]

Upper Limit/Toxicity

Currently, glutamine does not have an established upper limit and has not been shown to elicit any toxic effects in high amounts.[16]

Summary

Purpose

MuscleDefender by itself can be a recovery and performance enhancement product for the following:

- Highly stressed, calorie-restricted athletes, such as in-season bodybuilders
- Endurance athletes with frequent and heavy training loads
- Athletes and exercisers with a large calorie deficit for fat loss
- Any athlete susceptible to over-training due to excessive workloads and/or suboptimal recovery status

Unique Features

- Produced in an easy-to-mix powder
- Contains L-Glutamine peptide and a patented, stable form of L-Glutamine from Albion

Supplement Facts

Serving Size: 8 grams (One Level Scoop)
Servings Per Container: About 50

Amount Per Serving		% Daily Value
L-Glutamine	7.6 g	**
Magnesium (from 400 mg Magnesium Glycyl Glutamine‡)	34 mg	8.5%
Chromium (from 8 mg Chromium Nicotinate Glycinate Chelate‡)	200 mcg	167%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: None.

References

1 Groff JL, Gropper SS, Hunt SM. Advanced Nutrition and Human Metabolism. St. Paul:West Publishing Company;1995. pp. 196- 197, 201.
2 Brosnan JT. Interorgan amino acid transport and its regulation. J Nutr. 2003 Jun; 133(6 Suppl 1): 2068S-2072S. Review.
3 Blanchard MA, Jordan G, Desbrow B, MacKinnon LT, Jenkins DG. The influence of diet and exercise on muscle and plasma glutamine concentrations. Med Sci Sports Exerc. 2001 Jan;33(1):69-74.
4 Walsh NP, Blannin AK, Robson PJ, Gleeson M. Glutamine, exercise and immune function. Links and possible mechanisms. Sports Med. 1998 Sep;26(3):177-91. Review.
5 Varnier M, Leese GP, Thompson J, Rennie MJ. Stimulatory effect of glutamine on glycogen accumulation in human skeletal muscle. Am J Physiol 1995;269:E309-315.
6 Wilmore DW. Catabolic illness. Strategies for enhancing recovery. N Engl J Med. 1991 Sep 5; 325(10): 695-702. Review.
7 Haussinger D, Graf D, Weiergraber OH. Glutamine and cell signaling in liver. J Nutr. 2001 Sep;131(9 Suppl):2509S-14S; discussion 2523S-4S. Review.
8 Hankard RG, Haymond MW, Darmaun D. Effect of glutamine on leucine metabolism in humans. Am J Physiol. 1996 Oct;271(4 Pt 1):E748-54.
9 Calder PC, Yaqoob P. Glutamine and the immune system. Amino Acids. 1999;17(3):227-41. Review.
10 Rowbottom DG, Keast D, Morton AR. The emerging role of glutamine as an indicator of exercise stress and overtraining. Sports Med. 1996 Feb;21(2):80-97. Review.
11 Field CJ, Johnson I, Pratt VC. Glutamine and arginine: immunonutrients for improved health. Med Sci Sports Exerc. 2000 Jul;32(7 Suppl):S377-88. Review.
12 Budgett, R., et al. The overtraining syndrome. In Harries, M., et al. Oxford Textbook of Sports Medicine Oxford: Oxford University Press, 1998.
13 Castell L. Glutamine supplementation in vitro and in vivo, in exercise and in immunodepression. Sports Med. 2003;33(5):323-45. Review.
14 Agostini F, Biolo G. Effect of physical activity on glutamine metabolism. Curr Opin Clin Nutr Metab Care. 2010 Jan;13(1):58-64. Review.
15 Den Hond E, Hiele M, Peeters M, Ghoos Y, Rutgeerts P. Effect of long-term oral glutamine supplements on small intestinal permeability in patients with Crohn's disease. JPEN J Parenter Enteral Nutr. 1999 Jan-Feb;23(1):7-11.
16 Garlick PJ. The nature of human hazards associated with excessive intake of amino acids. J Nutr. 2004 Jun;134(6 Suppl):1633S-1639S; discussion 1664S-1666S, 1667S-1672S. Review.

dotFIT Powdered Drink Mixes

Drink mixes have been included in the nutrition dotFIT section of the SRG.

- Pre/Post Workout Formula & Meal Replacement -- see page 149
- FirstString -- see page 156
- WheySmooth -- see page 160

nutrition dotFIT™ Sport and Fitness Foods

Overview

The purpose of the nutrition dotFIT line (including shake mixes) is to accomplish two important health, sport and fitness goals: 1) satisfy and compliment the evolving change in society's eating patterns by supplying great tasting meals and snacks – i.e. deliver better, satisfying nutrition with fewer calories; 2) these same foods/mixes, because of the unique formulations, will also be able to deliver the perfect ingredients to serve as the pre- and post-exercise/activity supplement that has been proven necessary to enhance training induced results.

The multiple uses/goals of the nutrition dotFIT assortment are the following:

- Weight control[1,2,3,4,5,6,7,8,9,10]
- Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake[11,12,13,14]
- Snack between meals as an energy boost or hunger killer[15]
- Pre- and post-exercise/activity energy and recovery supplement
- Guiltless dessert

Rationale (see individual product descriptions & references for more information)

Weight control

It has been well established that successful dieters, weight loss maintainers, athletes and others able to control a healthy weight regularly incorporate meal replacement/substitute type foods[1,2,8,9,10,13,14,16,17] (see Figures 1 & 2), including energy bars or snacks, meal replacements or "protein shakes", etc. into their daily meal plans for the following reasons:

- More for less: using nutrition dotFIT products allows you to increase the frequency of daily meals while managing calories in order to satisfy appetite and maintain greater daily energy levels – i.e. more nutrition[18] and fullness with fewer calories and often a significant savings in groceries. Proper use throughout the day can deliver sound nutrition while helping to save calories, allowing you to partake in larger meals/favorite foods for desired times (e.g. higher calorie lunches and/or dinners)
- Proper use allows more accurate calorie counts of total daily food intake when compared to having to estimate the calories of self-prepared or unmarked meals[19]
- Products in the nutrition dotFIT category offer helpful portion control: people generally attempt to consume meals to completion; therefore meal portion size significantly impacts a person's total calorie intake. Overwhelming evidence validates that the smaller the portions, the fewer daily calories consumed[20,21,22] and vice-versa i.e. people tend to "eat with their eyes not their stomachs"[12,13,14,23]
- A healthy, lower calorie alternative to traditional fast foods
- Convenient storage anywhere and faster than stopping and picking up generally less healthy, higher calorie traditional fast foods

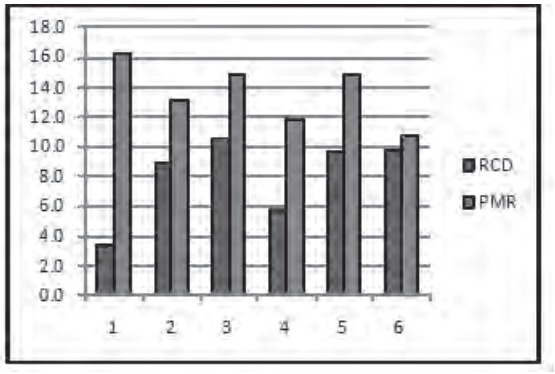

Figure 1: In all six studies the groups using meal replacements (PMR) as part of their overall calorie intake lost significantly more weight than the reduced calorie diet (RCD) group.[1]

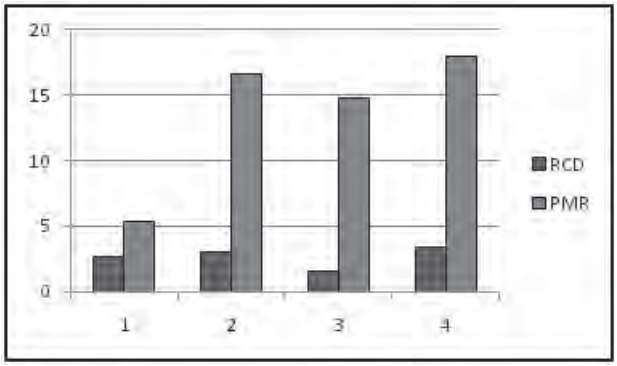

Figure 2: In a 1-year follow-up in the groups that were tracked, the subjects still using meal replacements maintained significantly more weight loss than the RCD group.[1]

Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake

Products in the nutrition dotFIT category can satisfy the criteria for smaller meals or be a balanced addition to increase meal size:

- Reduced meal size: busy people often need quick nutrition that can satisfy nutritional needs and deliver energy while keeping calories within a range that allows a healthy weight. Multiple, large, daily meals are not needed for most people today because of low activity in the workplace and during leisure time (sedentary entertainment).[24] And because of the continuous need to sit so we can be transported by vehicles in order to sit somewhere else. Therefore, nutrition dotFIT products can supply an adequate caloric meal as a part of one's overall daily meal planning
- Increase meal size or calorie intake: when weight/muscle gain is the goal and it becomes difficult to increase the consumption of traditional foods in order to continue to add lean body mass (LBM), nutrition dotFIT products offer the ideal solution. Easy/convenient to consume preparations can be added to any meal or daily menu plan to deliver exactly what's needed so surplus nutrients/calories are incorporated into muscle tissues rather than body fat when appropriate resistance exercise is included[25,26,27,28]

Snack between meals as an energy boost or hunger killer

Convenient for snacking to deliver quick energy or to take the edge off hunger without running up the calories. When hunger "nags", nutrition dotFIT products can satisfy the desire to snack on less healthy or poorly satiating foods. Using these products for snacking may also decrease the amount of food consumed in the subsequent meal or keep you from making an inappropriate food choice (e.g. decadent high calorie meal driven by an uncontrolled craving) as often happens when extra hungry and especially during weight loss.

Pre- and post-exercise/activity energy and recovery supplement

Because of the length of time it takes to digest and absorb the nutrients from traditional meals, whole/traditional food meals cannot deliver the required nutrients within a timeframe that allows maximum results induced by exercise when compared to the proper use of quick digesting specialized formulas.[25,27,29,30]

All proteins sticks, bars, cookies, and shakes meet the necessary "quick digestion", carbohydrate and protein content criteria that have been shown to deliver an increase in energy, maximize recovery and increase muscular development when consumed before[28,29,31] and after exercise.[25,32,33] Although dotFIT liquid pre- and post-feedings (mixes or ready-to-drinks) have the fastest absorption time, when they are not an option based on venue or preference, all other nutrition dotFIT products make a convenient and effective alternative when attempting to maximize the training induced "windows of growth".

Metabolic windows of growth

Immediately following exercise, muscle cell nutrient uptake is at its highest point of the day and therefore

this "window of opportunity" requires a well-designed, fast-acting formula.[26,31]

Virtually all studies have demonstrated that the inclusion of "immediate" pre- & post-training fast-acting carbohydrate/sugars and protein feedings can stimulate muscle protein synthesis (MPS)[29,34,35,36,37] and reduce muscle damage to a far greater extent than normal meals/feeding patterns.[26,29,33] In other words, no matter how well you eat throughout the day, you recover faster and build more muscle and strength by including these quickly absorbed pre- and post-exercise formulas (see Figure 3).[27,29,38] Simply put, the post exercise feeding activates the muscle building that takes place during this period – and without it there is little to no protein synthesis during this timeframe.

We also recently discovered that although the post-training metabolic window is active for as much as 60-90 minutes, its maximum activity (greatest nutrient uptake and protein synthesis capabilities) takes place immediately at the end of the training session.[27,30,37] From that point on, the longer you wait to supply the proper nutrients or the more time they take to get to the affected tissues, the less muscle building or recovery takes place during this period and can't be made up for at any other point in time.

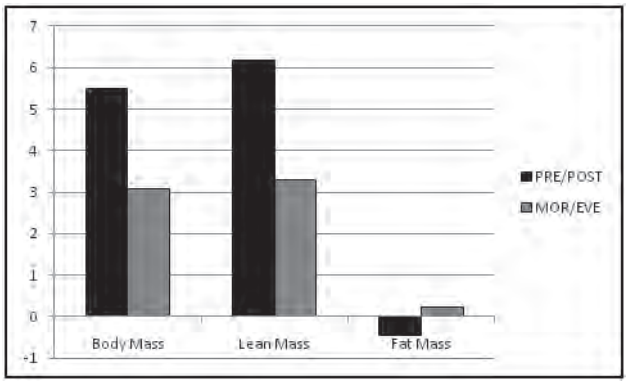

Figure 3: Training results from 23 experienced recreational bodybuilders resistance training for 10 weeks with all things (diet, supplements, training, etc.) equal except the addition of pre/post feedings yielded significantly greater gains in body mass, LBM, strength and reduction in fat mass for the pre/post feeding subjects.[27]

The proper pre/post formula

There is no longer a debate whether pre- and post-workout feedings enhance exercise-induced results. Volumes of peer review literature and studies continue to not only validate this now established fact, but also document the proper formulas.[39,40,41]

The formulas used in scientific studies are all relatively the same: within the range of 1.5-4 parts carbohydrate (CHO) to 1 part protein and low to no fat. The CHO range is based on the activity being studied – the longer the workout the higher the carbohydrate/sugar content. This formula produces the desired results i.e. quick, lasting energy, faster recovery and more muscle and strength gains from the workout.

The carbohydrate mixture must contain the proper amounts of simple, fast-acting sugars because the sugars/energy must enter the body quickly or the product loses effectiveness.[36,42,43] All formulas include complexes that contain glucose polymers in order to deliver immediate and consistent energy.[25,26,43,44] The formulas need to contain the right of amount of amino and fatty acids, which besides their role in muscle building, are also instrumental in managing the speed at which the carbohydrates continue to enter the body,[45] allowing the recipient higher but consistent energy levels throughout the desired period.

By consuming the same ingredients (as the post-workout formula) before the workout, we not only improve the user's training energy levels, we can also enhance the recovery and muscle-building process to a greater extent than solely ingesting the post-workout formula.

Although recovery primarily takes place after the workout, you can help speed and enhance the process before you start exercise by ingesting the formula 10-40 minutes before the workout (always make sure your pre-training, full food meal is eaten 2-3 hours before exercise unless you train first thing in the morning and time does not permit). Proper carbohydrate/sugar content is important because it stimulates insulin production and insulin is our body's most anabolic hormone thus "king" when it comes to building muscle.[46,47] Not only does this hormone start and continue the entire muscle-building process, but insulin also helps minimize the damage caused by exercise.[46,47,48] Insulin blunts the exercise-induced production of the catabolic hormone cortisol, which "tears down" muscle tissue. Increasing insulin levels at proper times allows the body to spend more incoming nutrients and time building muscles rather than using everything to simply repair muscle.[29,47,48] By ingesting the right drink pre-exercise, carbohydrates (CHO) not only supply workout energy but also kick-off the necessary insulin release that will work to mitigate the exercise-induced damage. When you repeat the process immediately post-workout, you quickly restore energy (glycogen) while stimulating a renewed insulin release, which initiates and enhances the muscle-building hormone process/cascade thus recovery and results.

Recently pre- and post-workout feedings of carbohydrate and protein have also demonstrated the abilities to reduce delayed onset of muscle soreness (DOMS),[29,36,49] improve competitive performance,[28,37,49] enhance immune function by decreasing exercise induced neutrophil degranulation,[32] speed the recovery of neuromuscular functions after heavy training[33] and increase the cell signaling related to protein synthesis,[37] all compared to placebo and/or no immediate pre- and post-exercise/training feedings.

Guiltless dessert

All nutrition dotFIT products can serve as great tasting, healthy low-calorie desserts and can satisfy any "sweet tooth".

Products in the nutrition dotFIT category have wonderful flavors and textures with the macronutrient blend (protein, fat and carbohydrate ratios) designed to satisfy the appetite for far fewer calories than it would normally take using traditional desserts.

Typical Use

Use as needed to satisfy any of the stated goals:

- Weight control for portion control and accurate calorie counts
- Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake
- Snack between meals as an energy boost or hunger killer
- Pre- and post-exercise/activity energy and recovery supplement
- Guiltless dessert

Summary

Purpose

- Products in the nutrition dotFIT category supply nutrient-rich, convenient between-meal snacks to boost energy, curb hunger and assist in weight control
- Can also be used to increase daily caloric intake when unable to do so by consuming whole food
- Pre- and post-workout snack to enhance energy and recovery
- Can be used during training
- Can be used as a guiltless dessert
- A healthy, convenient food assortment designed to be integrated into your daily meal planning in order to assist you in reaching and maintaining your sport and fitness goals. All products in the nutrition dotFIT line can be selected based on taste, preference, venue, size and shape or calorie requirements for any of the above goals

Unique Features

- Products in the nutrition dotFIT category are designed in a synergistic relationship with all dotFIT products and a person's traditional food intake. These products are NOT spiked with unnecessary nutrients. Most other products in this space (e.g. bars, shakes, ready to drinks, etc.) are heavily

spiked with nutrients that can lead to undesirable levels within the body when combining multiple manufacturers, products and normal food intake. When consuming only dotFIT products as directed with one's normal daily food intake, the recipient is assured of keeping the body at a safe and optimal nutrient level
- A good source of calcium and fiber
- An excellent source of protein
- Formulated and manufactured for great taste and pleasing texture, all nutrition dotFIT products meet or exceed the FDA's guideline for "High Protein" and foods are microwaveable
- Bars, protein sticks, cookies, etc., are handmade and baked with high quality ingredients
- Third-party testing: Commitment to producing world-class products is our #1 priority. Rigorous testing, both in-house and through third-party FDA approved laboratories, assures that at all nutritional claims meet or surpass FDA guidelines, USDA guidelines, and industry norms

References

1 Heymsfield SB, van Mierlo CA, van der Knaap HC, Heo M, Frier HI. Weight management using a meal replacement strategy: meta and pooling analysis from six studies. Int J Obes Relat Metab Disord. 2003 May;27(5):537-49.

2 Ashley JM, St Jeor ST, Perumean-Chaney S, Schrage J, Bovee V. Meal replacements in weight intervention. Obes Res. 2001 Nov;9 Suppl 4:312S-320S.
3 Ditschuneit HH. Do meal replacement drinks have a role in diabetes management? Nestle Nutr Workshop Ser Clin Perform Programme. 2006;11:171-9; discussion 179-81. Review.
4 Li Z, Hong K, Saltsman P, DeShields S, Bellman M, Thames G, Liu Y, Wang HJ, Elashoff R, Heber D. Long-term efficacy of soy based meal replacements vs an individualized diet plan in obese type II DM patients: relative effects on weight loss, metabolic parameters, and C-reactive protein. Eur J Clin Nutr. 2005 Mar;59(3):411-8.
5 Poston WS, Haddock CK, Pinkston MM, Pace P, Karakoc ND, Reeves RS, Foreyt JP. Weight loss with meal replacement and meal replacement plus snacks: a randomized trial. Int J Obes (Lond). 2005 Sep;29(9):1107-14.
6 Cheskin LJ, Mitchell AM, Jhaveri AD, Mitola AH, Davis LM, Lewis RA, Yep MA, Lycan TW. Efficacy of meal replacements versus a standard food-based diet for weight loss in type 2 diabetes: a controlled clinical trial. Diabetes Educ. 2008 Jan-Feb;34(1):118- 27.
7 Wal JS, McBurney MI, Cho S, Dhurandhar NV. Ready-to-eat cereal products as meal replacements for weight loss. Int J Food Sci Nutr. 2007 Aug;58(5):331-40.
8 Smith TJ, Sigrist LD, Bathalon GP, McGraw S, Karl JP, Young AJ. Efficacy of a meal-replacement program for promoting blood lipid changes and weight and body fat loss in US Army soldiers. J Am Diet Assoc. 2010 Feb;110(2):268-73.
9 Flechtner-Mors M, Boehm BO, Wittmann R, Thoma U, Ditschuneit HH. Enhanced weight loss with protein-enriched meal replacements in subjects with the metabolic syndrome. Diabetes Metab Res Rev. 2010 Jul;26(5):393-405.
10 Hamdy O, Zwiefelhofer D. Weight management using a meal replacement strategy in type 2 diabetes. Curr Diab Rep. 2010 Apr;10(2):159-64. Review.
11 Jeffery RW, Wing RR, Thorson C, Burton LR, Raether C, Harvey J, Mullen M. Strengthening behavioral interventions for weight loss: a randomized trial of food provision and monetary incentives. J Consult Clin Psychol. 1993 Dec;61(6):1038-45
12 McCarron DA, Oparil S, Chait A, Haynes RB, Kris-Etherton P, Stern JS, Resnick LM, Clark S, Morris CD, Hatton DC, Metz JA, McMahon M, Holcomb S, Snyder GW, Pi-Sunyer FX. Nutritional management of cardiovascular risk factors. A randomized clinical trial. Arch Intern Med. 1997 Jan 27;157(2):169-77.
13 Wing RR, Jeffery RW. Food provision as a strategy to promote weight loss. Obes Res. 2001 Nov;9 Suppl 4:271S 275S. Review.
14 Wing RR, Jeffery RW, Burton LR, Thorson C, Nissinoff KS, Baxter JE. Food provision vs structured meal plans in the behavioral treatment of obesity. Int J Obes Relat Metab Disord. 1996 Jan;20(1):56-62.
15 Stull AJ, Apolzan JW, Thalacker-Mercer AE, Iglay HB, Campbell WW. Liquid and solid meal replacement products differentially affect postprandial appetite and food intake in older adults. J Am Diet Assoc. 2008 Jul;108(7):1226-30.

16 Wadden TA, Butryn ML, Wilson C. Lifestyle modification for the management of obesity. Gastroenterology. 2007 May;132(6):2226-38. Review. Erratum in: Gastroenterology. 2007 Jul;133(1):371.
17 Berkel LA, Poston WS, Reeves RS, Foreyt JP. Behavioral interventions for obesity. J Am Diet Assoc. 2005 May;105(5 Suppl 1):S35-43. Review.
18 Ashley JM, Herzog H, Clodfelter S, Bovee V, Schrage J, Pritsos C. Nutrient adequacy during weight loss interventions: a randomized study in women comparing the dietary intake in a meal replacement group with a traditional food group. Nutr J. 2007 Jun 25;6:12.
19 Abbot JM, Thomson CA, Ranger-Moore J, Teixeira PJ, Lohman TG, Taren DL, Cussler E, Going SB, Houtkooper LB. Psychosocial and behavioral profile and predictors of self-reported energy underreporting in obese middle-aged women. J Am Diet Assoc. 2008 Jan;108(1):114-9.
20 Levitsky DA, Youn T. The more food young adults are served, the more they overeat. J Nutr. 2004 Oct;134(10):2546-9.
21 Wansink B, Painter JE, North J. Bottomless bowls: why visual cues of portion size may influence intake. Obes Res. 2005 Jan;13(1):93-100.
22 Rolls BJ, Roe LS, Meengs JS. Reductions in portion size and energy density of foods are additive and lead to sustained decreases in energy intake. Am J Clin Nutr. 2006 Jan;83(1):11-7.
23 Jeffery RW, Wing RR, Thorson C, Burton LR, Raether C, Harvey J, Mullen M. Strengthening behavioral interventions for weight loss: a randomized trial of food provision and monetary incentives. J Consult Clin Psychol. 1993 Dec;61(6):1038-45
24 Gordon-Larsen P, Nelson MC, Popkin BM. Longitudinal physical activity and sedentary behavior trends: adolescence to adulthood. Am J Prev Med. 2004 Nov;27(4):277-83. Erratum in: Am J Prev Med. 2005 Jun;28(5):496. Am J Prev Med. 2006 Oct;31(4):353.
25 Rasmussen BB, Tipton KD, Miller SL, Wolf SE, Wolfe RR. An oral essential amino acid-carbohydrate supplement enhances muscle protein anabolism after resistance exercise. J Appl Physiol. 2000 Feb;88(2):386-92.
26 Baty JJ, Hwang H, Ding Z, Bernard JR, Wang B, Kwon B, Ivy JL. The effect of a carbohydrate and protein supplement on resistance exercise performance, hormonal response, and muscle damage. J Strength Cond Res. 2007 May;21(2):321-9.
27 Cribb PJ, Hayes A. Effects of supplement timing and resistance exercise on skeletal muscle hypertrophy. Med Sci Sports Exerc. 2006 Nov;38(11):1918-25.
28 Cathcart AJ, Murgatroyd SR, McNab A, Whyte LJ, Easton C. Combined carbohydrate-protein supplementation improves competitive endurance exercise performance in the heat. Eur J Appl Physiol. 2011 Jan 23. [Epub ahead of print]
29 Cockburn E, Stevenson E, Hayes PR, Robson-Ansley P, Howatson G. Effect of milk-based carbohydrate-protein supplement timing on the attenuation of exercise-induced muscle damage. Appl Physiol Nutr Metab. 2010 Jun;35(3):270-7.
30 Beelen M, Burke LM, Gibala MJ, van Loon L JC. Nutritional strategies to promote postexercise recovery. Int J Sport Nutr Exerc Metab. 2010 Dec;20(6):515-32.
31 Tipton KD, Rasmussen BB, Miller SL, Wolf SE, Owens-Stovall SK, Petrini BE, Wolfe RR. Timing of amino acid-carbohydrate ingestion alters anabolic response of muscle to resistance exercise. Am J Physiol Endocrinol Metab. 2001 Aug;281(2):E197-206.
32 Costa RJ, Oliver SJ, Laing SJ, Waiters R, Bilzon JL, Walsh NP. Influence of timing of postexercise carbohydrate-protein ingestion on selected immune indices. Int J Sport Nutr Exerc Metab. 2009 Aug;19(4):366-84.
33 Blacker SD, Williams NC, Fallowfield JL, Bilzon JLj, Willems ME. Carbohydrate vs protein supplementation for recovery of neuromuscular function following prolonged load carriage. J Int Soc Sports Nutr. 2010 Jan 12;7:2.
34 Koopman R, Wagenmakers AJ, Manders RJ, Zorenc AH, Senden JM, Gorselink M, Keizer HA, van Loon LJ. Combined ingestion of protein and free leucine with carbohydrate increases postexercise muscle protein synthesis in vivo in male subjects. Am J Physiol Endocrinol Metab. 2005 Apr;288(4):E645-53. Epub 2004 Nov 23.
35 Esmarck B, Andersen JL, Olsen S, Richter EA, Mizuno M, Kjaer M. Timing of postexercise protein intake is important for muscle hypertrophy with resistance training in elderly humans. J Physiol. 2001 Aug 15;535(Pt 1):301-11.
36 Betts JA, Williams C. Short-term recovery from prolonged exercise: exploring the potential for protein ingestion to accentuate the benefits of carbohydrate supplements. Sports Med. 2010 Nov 1;40(11):941-59.

doi: 10.2165/11536900-000000000-00000.
37 Coffey VG, Moore DR, Burd NA, Rerecich T, Stellingwerff T, Garnham AP, Phillips SM, Hawley JA. Nutrient provision increases signalling and protein synthesis in human skeletal muscle after repeated sprints. Eur J Appl Physiol. 2010 Dec 17. [Epub ahead of print]
38 Paddon-Jones D, Sheffield-Moore M, Aarsland A, Wolfe RR, Ferrando AA. Exogenous amino acids stimulate human muscle anabolism without interfering with the response to mixed meal ingestion. Am J Physiol Endocrinol Metab. 2005 Apr;288(4):E761-7. Epub 2004 Nov 30.
39 Cockburn E, Hayes PR, French DN, Stevenson E, St Clair Gibson A. Acute milk-based protein-CHO supplementation attenuates exercise-induced muscle damage. Appl Physiol Nutr Metab. 2008 Aug;33(4):775-83.
40 Luden ND, Saunders MJ, Todd MK. Postexercise carbohydrate-protein- antioxidant ingestion decreases plasma creatine kinase and muscle soreness. Int J Sport Nutr Exerc Metab. 2007 Feb;17(1):109-23.
41 Millard-Stafford M, Childers WL, Conger SA, Kampfer AJ, Rahnert JA. Recovery nutrition: timing and composition after endurance exercise. Curr Sports Med Rep. 2008 Jul-Aug;7(4):193-201. Review.
42 Campbell C, Prince D, Braun M, Applegate E, Casazza GA. Carbohydrate-supplement form and exercise performance. Int J Sport Nutr Exerc Metab. 2008 Apr;18(2):179-90.
43 Jentjens RL, Underwood K, Achten J, Currell K, Mann CH, Jeukendrup AE. Exogenous carbohydrate oxidation rates are elevated after combined ingestion of glucose and fructose during exercise in the heat. J Appl Physiol. 2006 Mar;100(3):807- 16. Epub 2005 Nov 10.
44 Jentjens RL, Moseley L, Waring RH, Harding LK, Jeukendrup AE. Oxidation of combined ingestion of glucose and fructose during exercise. J Appl Physiol. 2004 Apr;96(4):1277-84. Epub 2003 Dec 2.
45 Dreyer HC, Drummond MJ, Pennings B, Fujita S, Glynn EL, Chinkes DL, Dhanani S, Volpi E, Rasmussen BB. Leucine-enriched essential amino acid and carbohydrate ingestion following resistance exercise enhances mTOR signaling and protein synthesis in human muscle. Am J Physiol Endocrinol Metab. 2008 Feb;294(2):E392-400. Epub 2007 Dec 4.
46 Miller SL, Tipton KD, Chinkes DL, Wolf SE, Wolfe RR. Independent and combined effects of amino acids and glucose after resistance exercise. Med Sci Sports Exerc. 2003 Mar;35(3):449-55.
47 Kimball SR, Farrell PA, Jefferson LS. Invited Review: Role of insulin in translational control of protein synthesis in skeletal muscle by amino acids or exercise. J Appl Physiol. 2002 Sep;93(3):1168-80. Review.
48 Wojtaszewski JF, Nielsen JN, Richter EA. Invited review: effect of acute exercise on insulin signaling and action in humans. J Appl Physiol. 2002 Jul;93(1):384-92. Review.
49 Saunders MJ, Moore RW, Kies AK, Luden ND, Pratt CA. Carbohydrate and protein hydrolysate coingestions improvement of late-exercise time-trial performance. Int J Sport Nutr Exerc Metab. 2009 Apr;19(2):136-49.

Ready-to-Eat Bars and Baked Goods

Positioning

A healthy convenient food assortment designed to be integrated into your daily meal planning in order to assist you in reaching and maintaining your sport and fitness goals. All products in the nutrition dotFIT line can be selected based on taste, preference, venue, size and shape or calorie requirements for any of the typical uses listed below.

Unique features

- Contains multiple high quality protein sources
- Products in the nutrition dotFIT category are designed in a synergistic relationship with all dotFIT products and a person's traditional food intake. These products are NOT spiked with unnecessary nutrients. Most other products in this space (e.g. bars, shakes, ready to drinks, etc.) are heavily spiked with many nutrients that can lead to undesirable levels within the body when combining multiple manufacturers, products and normal food intake. Because of our product synergy, use of our complete product line promotes safe and optimal daily nutrient intake
- Formulated and manufactured for great taste and pleasing texture, all products in the nutrition dotFIT category meet or exceed the FDA's guideline for "High Protein" and foods are microwaveable
- Bars, protein sticks, cookies, etc., are handmade and baked with high quality ingredients
- Third-party testing: Commitment to producing world-class products is our #1 priority. Rigorous testing, both in-house and through third-party, FDA-approved laboratories, assures our clients that all nutritional claims meet or surpass FDA guidelines, USDA guidelines, and industry norms

Typical use

Use as needed to satisfy any of the stated goals:

- Weight control for portion control and accurate calorie counts
- Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake
- Between meal snack as an energy boost or hunger killer
- Pre- and post-exercise/activity energy and recovery supplement
- Guiltless dessert

Iced Lemon Vanilla Cream dotSTICK

Uses

- Weight control for portion control and accurate calorie counts
- Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake
- Between meal snack as an energy boost or hunger killer
- Pre- and post-exercise/activity energy and recovery supplement
- Guiltless dessert

Description and Unique Features

- Provides 140 mg of ALA Omega-3 from flaxseed
- High protein with low cholesterol and good source of calcium and fiber
- Helps promote/support/maintain a healthy digestive/immune system
- On-the-go portability in a unique convenient shape – easy to carry anywhere
- Handmade and baked with high quality ingredients
- Contains multiple high quality protein sources
- Formulated and manufactured for great taste and pleasing texture, the Protein Stick also meets or exceeds the FDA's guideline for "High Protein" and is a microwaveable product
- Third-party testing: Commitment to producing world-class products is our #1 priority. Rigorous testing, both in-house and through third-party, FDA-approved laboratories, assures our clients that all nutritional claims meet or surpass FDA guidelines, USDA guidelines, and industry norms

Nutrition Facts

Serving Size: 1 Bar (50g)
Servings per Package: 1
Calories 190
Calories from Fat 54

*Percent Daily Value (DV) are based on a 2,000 calorie diet.
†Daily Value Not Established.

Amount/Serving	%DV*	Amount/Serving	%DV*
Total Fat 6g	**9%**	**Total Carb** 26g	**9%**
Saturated Fat 2g	10%	Dietary Fiber 3g	12%
Trans Fat 0g	†	Sugars 8g	†
Cholesterol 10mg	**3%**	Sugar Alcohol 8g**	†
Sodium 170mg	**7%**	**Protein** 12g	**24%**

Vitamin A **3%** • Vitamin C **1%** • Calcium **10%** • Iron **5%**

Iced Peanut Butter Delight dotSTICK

Uses

- Weight control for portion control and accurate calorie counts
- Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake
- Between meal snack as an energy boost or hunger killer
- Pre- and post-exercise/activity energy and recovery supplement
- Guiltless dessert

Description and Unique Features

- Provides 140 mg of ALA Omega-3 from flaxseed
- High protein with low cholesterol and good source of calcium and fiber
- Helps promote/support/maintain a healthy digestive/immune system
- On-the-go portability in a unique convenient shape – easy to carry anywhere
- Handmade and baked with high quality ingredients
- Contains multiple high quality protein sources
- Formulated and manufactured for great taste and pleasing texture, the Protein Stick also meets or exceeds the FDA's guideline for "High Protein" and is a microwaveable product
- Third-party testing: Commitment to producing world-class products is our #1 priority. Rigorous testing, both in-house and through third-party, FDA-approved laboratories, assures our clients that all nutritional claims meet or surpass FDA guidelines, USDA guidelines, and industry norms

Nutrition Facts

Serving Size: 1 Bar (50g)
Servings per Package: 1
Calories 190
Calories from Fat 54

*Percent Daily Value (DV) are based on a 2,000 calorie diet.
†Daily Value Not Established.

Amount/Serving	%DV*	Amount/Serving	%DV*
Total Fat 6g	**9%**	**Total Carb** 26g	**9%**
Saturated Fat 2g	10%	Dietary Fiber 3g	12%
Trans Fat 0g	†	Sugars 8g	†
Cholesterol 10mg	**3%**	Sugar Alcohol 8g**	†
Sodium 170mg	**7%**	**Protein** 12g	**24%**

Vitamin A **3%** • Vitamin C **1%** • Calcium **10%** • Iron **5%**

Iced Blueberry dotBAR

Uses

- An ideal, quick breakfast
- Weight control – precise portion control and accurate calorie counts
- Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake
- Between meal snack as an energy boost or hunger killer
- Pre- and post-exercise/activity energy and recovery supplement
- Guiltless dessert

Description and Unique Features

- Provides 140 mg of ALA Omega-3 from flaxseed
- Contains whole grains and made with real fruit
- High protein with low cholesterol and good source of calcium and fiber
- Helps promote/support/maintain a healthy digestive/immune system
- On-the-go portability in a unique convenient shape – easy to carry anywhere
- Handmade and baked with high quality ingredients
- Contains multiple high quality protein sources
- Formulated and manufactured for great taste and pleasing texture, the Breakfast Bar also meets or exceeds the FDA's guideline for "High Protein" and is a microwaveable product
- Third-Party testing: Commitment to producing world-class products is our #1 priority. Rigorous testing, both in-house and through third-party, FDA-approved laboratories, assures our clients that all nutritional claims meet or surpass FDA guidelines, USDA guidelines, and industry norms

Nutrition Facts

Serving Size: 1 Bar (55g)
Servings per Package: 1
Calories 220
Calories from Fat 45

*Percent Daily Value (DV) are based on a 2,000 calorie diet.
†Daily Value Not Established.

Amount/Serving	%DV*	Amount/Serving	%DV*
Total Fat 5g	**8%**	**Total Carbs** 29g	**10%**
Saturated Fat 2g	10%	Dietary Fiber 3g	12%
Trans Fat 0g	†	Sugars 9g	†
Cholesterol 10mg	**3%**	Sugar Alcohol 11g**	†
Sodium 170mg	**7%**	**Protein** 15g	**30%**

Vitamin A **2%** • Vitamin C **0%** • Calcium **10%** • Iron **6%**

Peanut Butter Crunch dotBAR

Uses

- Weight control for portion control and accurate calorie counts
- Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake
- Snack between meals as an energy boost or hunger killer
- Pre- and post-exercise/activity energy and recovery supplement
- Guiltless dessert

Description and Unique Features

- High protein with low cholesterol and good source of calcium and fiber
- On-the-go portability
- Handmade and baked with high quality ingredients
- Contains multiple high quality protein sources
- This product meets the NCAA guidelines for college athletes.
- Formulated and manufactured for great taste and pleasing texture, the dotTREAT also meets or exceeds the FDA's guideline for "High Protein" and is a microwaveable product
- Third-Party testing: Commitment to producing world-class products is our #1 priority. Rigorous testing, both in-house and through third-party FDA approved laboratories, assures our clients that all nutritional claims meet or surpass FDA guidelines, USDA guidelines, and industry norms

Nutrition Facts
Serving Size: 1 Bar (45g)
Servings per Package: 1
Calories 190
Calories from Fat 50

*Percent Daily Value (DV) are based on a 2,000 calorie diet.
†Daily Value Not Established.

Amount/Serving	%DV*	Amount/Serving	%DV*
Total Fat 5g	**8%**	**Total Carbs** 23g	**8%**
Saturated Fat 2g	10%	Dietary Fiber 1g	4%
Trans Fat 0g	†	Sugars 14g	†
Cholesterol 0mg	**0%**	**Protein** 12g	**24%**
Sodium 210mg	**9%**		

Vitamin A **0%** • Vitamin C **0%** • Calcium **6%** • Iron **6%**

Chocolate Chip Cookie Dough Delight dotBAR

Uses

- Weight control for portion control and accurate calorie counts
- Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake
- Snack between meals as an energy boost or hunger killer
- Pre- and post-exercise/activity energy and recovery supplement
- Guiltless dessert

Description and Unique Features

- High protein with low cholesterol and good source of calcium and fiber
- On-the-go portability
- Handmade and baked with high quality ingredients
- Contains multiple high quality protein sources
- This product meets the NCAA guidelines for college athletes.
- Formulated and manufactured for great taste and pleasing texture, the dotTREAT also meets or exceeds the FDA's guideline for "High Protein" and is a microwaveable product
- Third-Party testing: Commitment to producing world-class products is our #1 priority. Rigorous testing, both in-house and through third-party FDA approved laboratories, assures our clients that all nutritional claims meet or surpass FDA guidelines, USDA guidelines, and industry norms

Nutrition Facts

Serving Size: 1 Bar (50g)
Servings per Package: 1
Calories 200
Calories from Fat 63

*Percent Daily Value (DV) are based on a 2,000 calorie diet.
†Daily Value Not Established.

Amount/Serving	%DV*	Amount/Serving	%DV*
Total Fat 7g	**11%**	**Total Carbs** 21g	**7%**
Saturated Fat 3g	15%	Dietary Fiber 2g	8%
Trans Fat 0g	†	Sugars 11g	†
Cholesterol 25mg	**8%**	**Protein** 15g	**30%**
Sodium 130mg	**5%**		

Vitamin A **20%** • Vitamin C **25%** • Calcium **50%** • Iron **10%**

dotFIT Powdered Mixes

All products can be used to significantly improve

1) any weight loss program
2) exercise-induced muscle and performance gains
3) recovery from exercise and training bouts
4) energy levels
5) the nutritional content of diet

Positioning

A healthy, convenient assortment of mixes designed to be integrated into your daily meal planning in order to assist you in reaching and maintaining your sport and fitness goals. All products in the dotFIT powdered mix line can be selected based on taste, preference, venue, or calorie requirements for any of reasons listed in the Typical Use section shown below.

Advantages of mixes

- Have it your way: powdered mixes are simply the starting materials you use to create whatever formula is needed
  - By adding other ingredients into the mix, you can create any level or ratio of calories, protein, fats, carbohydrates (CHO) and other nutrients
- Can be used as a tasty and convenient way to deliver important but often neglected nutrients
  - Many nutritionally important fruits containing fiber, phytochemicals, etc., can be mixed with the powders to help anyone regularly consume a healthy diet
- Allows near immediate nutrient absorption that continues throughout the necessary time period that allows the exerciser to maximize the muscle building/recovery potential of the post exercise "metabolic windows" of muscle growth & repair (see nutrition dotFIT overview section on "metabolic windows"). All formulas used in studies demonstrating performance and size enhancements using pre- & post-exercise feedings were in liquid form
- Can deliver immediate energy lasting throughout the training period as well as the necessary nutrition to maximize the exercise bout whenever time is an issue

Overall unique features

- See individual dotFIT powdered mix products for their specific unique features
- All use only the highest quality/grade proteins with enhancing cofactors (e.g. Aminogen®, PeptoPro®, lactase, etc.) to aid digestion, absorption and utilization
- No aspartame, low sugar and relatively low sodium
- nutrition dotFIT products are designed in a synergistic relationship with all dotFIT products and a person's traditional food intake. nutrition dotFIT products are NOT spiked with unnecessary nutrients. Most other products in this space (e.g. bars, shakes, ready to drinks, etc.) are heavily spiked with many nutrients that can lead to undesirable levels within the body when combining multiple manufactures, products and normal food intake. Because of our product synergy, use of our complete product line promotes safe and optimal daily nutrient intake
- Formulated and manufactured for great taste and pleasing texture in an FDA-registered facility in compliance with Good Manufacturing Practices (GMPs) and maintains rigorous product testing

Typical Use

Use as needed to satisfy any of the stated goals:

- Weight control for portion control and accurate calorie counts
- Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake
- Vehicle to deliver often ignored but healthy nutrients (add desired ingredients to the mix)
- Between meal snack as an energy boost or hunger killer
- Pre- and post-exercise/activity energy and recovery supplement
- Guiltless dessert

Pre/Post Workout Formula & Meal Replacement™

Goal

The purpose of the Pre/Post Workout Formula is to accomplish two important health, sport and fitness goals: 1) satisfy and compliment the evolving change in society's eating patterns by supplying great tasting meals and snacks – i.e. deliver better, satisfying nutrition in fewer calories; 2) because of the unique formulations, all dotFIT mixes, including the Pre/Post Workout Formula, will also be able to deliver the perfect ingredients to serve as the pre- and post-exercise/activity supplement that has been proven necessary to enhance training-induced results.

Anchored by a blend of high-quality proteins (whey protein isolate, whey protein concentrate, calcium caseinate, and micellar casein), medium chain triglycerides and essential fatty acids to support the special needs of active individuals, the Pre/Post Workout Formula was designed to provide critical support for muscle growth and repair while simultaneously providing a steady supply of energy.

Rationale

Weight control

It has been well established that successful dieters, weight loss maintainers, athletes and others able to control a healthy weight regularly incorporate meal replacement/substitute type foods[1,2,3,4,5,6,7,8,9,10] (see Figure 4 A & B), such as meal replacements, "protein shakes," etc. into their daily meal plans for the following reasons:[11,12,13,14,15,16]

- More for less--allows you to increase the frequency of daily meals while managing calories in order to satisfy appetite[17] and maintain greater daily energy levels i.e. more nutrition[18] and fullness with fewer calories and often significant savings in groceries. Proper use throughout the day can deliver good nutrition while helping to save calories, allowing you to partake in larger meals/favorite foods at desired times (e.g. higher calorie lunches and/or dinners)
- Accurate calorie counts of total daily food intake when compared to having to estimate the calories of self-prepared or unmarked meals[19]
- Portion control--people generally attempt to consume meals to completion; therefore meal portion size significantly impacts a person's total calorie intake. Overwhelming evidence validates that the smaller the portions, the fewer daily calories consumed[20,21,22]
- A healthy, lower calorie alternative to traditional fast foods
- Convenient storage anywhere and faster than stopping and picking up generally less healthy, higher calorie, traditional fast foods

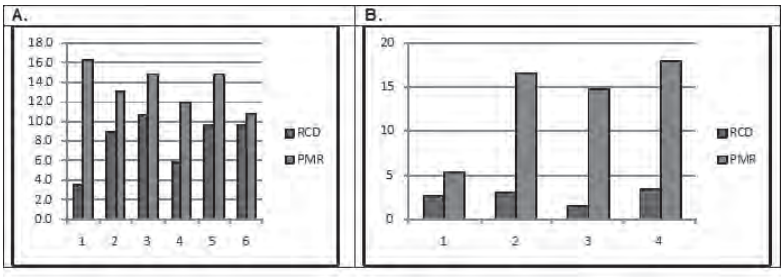

Figure 4: A. In all six studies the groups that were using meal replacements (PMR) as part of their overall calorie intake lost significantly more weight than the reduced calorie diet (RCD) group. B. In a 1-year follow-up in the groups that were tracked, the subjects still using meal replacements maintained significantly more weight loss than the RCD group.[1]

Daily menu incorporation

Pre/Post Workout Formula satisfies the criteria for smaller meals or can be a balanced addition to increase meal size.

Reduced meal size: busy people often need quick nutrition that can satisfy nutritional needs and deliver energy while keeping calories within a range that allows a healthy weight. Multiple large daily meals are not needed for most people today because of low activity in the workplace and during leisure time (sedentary entertainment).[23]

Increase meal size or calorie intake: when weight/muscle gain is the goal and it becomes difficult to increase the consumption of traditional foods in order to continue to add lean body mass (LBM), liquid meals offer the ideal solution. Easy/convenient to consume preparations can be added to any meal or daily menu plan to deliver exactly what's needed so the surplus nutrients/calories are incorporated into muscle tissues rather than body fat when appropriate resistance exercise is included.[24,25,26]

Snack between meals: The Pre/Post Workout Formula is convenient for snacking to deliver quick energy or to take the edge off hunger without running up the calories. Using the meal replacement shake for snacking may also decrease the amount of food consumed in the subsequent meal or keep you from making an inappropriate food choice (e.g. decadent high calorie meal driven by an uncontrolled craving) as often happens when extra hungry and especially during weight loss.

Pre- and post-exercise/activity energy and recovery supplement

Because of the length of time it takes to digest and absorb the nutrients from traditional meals, whole/traditional food meals cannot deliver the required nutrients within a timeframe that allows maximum results induced by exercise when compared to the proper use of quick-digesting specialized formulas.[24,26,27,28]

All dotFIT mixes including Pre/Post Workout Formula meet the necessary "quick digestion", carbohydrate and protein content criteria that have been shown to deliver an increase in energy, maximize recovery and increase muscular development when consumed before[27,29,30] and after exercise.[24,31,32] dotFIT liquid pre- and post- feedings (shakes/mixes or ready to drinks) have the fastest absorption time. Requiring little time spent on digestion and absorption and maximizing the rate of recovery and building.

Metabolic windows of growth

Immediately following exercise, muscle cell nutrient uptake is at its highest point of the day and therefore this "window of opportunity" requires a well-designed fast-acting formula.[25]

Virtually all studies have demonstrated that the inclusion of "immediate" pre- & post-training fast-acting carbohydrate/sugars and protein feedings can stimulate muscle protein synthesis (MPS)[27,33,34,35,36] and reduce muscle damage to a far greater extent than normal meals/feeding patterns.[27,32,37,38] In other words, no matter how well you eat throughout the day, you recover faster and build more muscle and strength by including these quickly absorbed pre- and post-exercise formulas (see Figure 5).[26,27,39]

We also recently discovered that although the post-training metabolic window is active for as much as 60-90 minutes, its maximum activity (greatest nutrient uptake and protein synthesis capabilities) takes place immediately at the end of the training session.[26,28,36] From that point on, the longer you wait to supply the proper nutrients or the more time they take to get to the affected tissues, the less muscle building or recovery takes place during this period and can't be made up for at any other point in time.

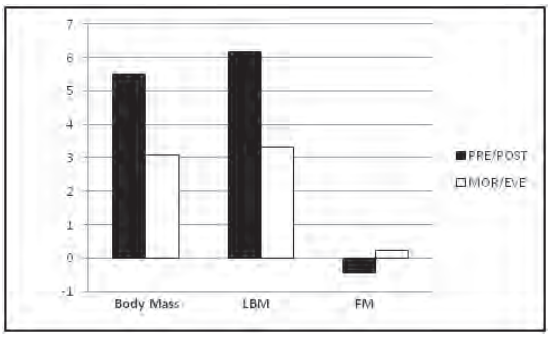

Figure 5: Training results from 23 experienced recreational bodybuilders resistance training for 10 weeks with all things (diet, supplements, training, etc.) equal except the addition of pre/post feedings yielded significantly greater gains in body mass, LBM, and reduction in fat mass for the pre/post feeding subjects.

The proper pre/post formula

There is no longer a debate whether pre- and post-workout feedings enhance exercise-induced results. Volumes of peer review literature and studies continue to not only validate this now established fact, but also document the proper formulas.[40,41,42]

The formulas used in scientific studies are all relatively the same: within the range of one point five to four parts carbohydrate (CHO) to one part protein and low to no fat. The CHO range is based on the activity being studied – the longer the workout the higher the carbohydrate/sugar content. The Pre/Post Workout Formula produces the desired results i.e. quick lasting energy, faster recovery and more muscle and strength gains from your workout.

The carbohydrate mixture must contain the proper amounts of simple, fast-acting sugars because the sugars/energy must enter the body quickly or the product loses effectiveness.[35,43,44] The Pre/Post Workout Formula contains a sophisticated carbohydrate complex that can release almost immediately and continuously throughout the timeframe necessary to maximize protein synthesis during "metabolic windows" of growth. The formula also contains the right amount of amino and fatty acids, which besides their role in muscle building[45] are also instrumental in managing the speed in which the carbohydrates continue to enter the body, allowing the recipient higher but consistent energy levels throughout the desired period. By consuming the same ingredients as the post-workout formula before the workout, we not only improve the user's training energy levels, we can also enhance the recovery and muscle building process to a greater extent than solely ingesting the post-workout formula.[28]

Although recovery primarily takes place after the workout, you can help speed and enhance the process before you start exercise by ingesting the Pre/Post Workout Formula ten to 40 minutes before the workout (always make sure your pre-training full food meal is eaten two to three hours before exercise unless you train first thing in the morning and time does not permit). Proper carbohydrate/sugar content is important because it stimulates insulin production and insulin is our body's most anabolic hormone thus "king" when it comes to building muscle.[46,47] When you repeat the process immediately post-workout, you quickly restore energy (glycogen) while stimulating a renewed insulin release, which initiates and enhances the muscle-building hormone process/cascade thus recovery and results.

Recently pre and post feedings of carbohydrate and protein have also demonstrated the abilities to: reduce delayed onset of muscle soreness (DOMS),[27,35,48] improve competitive performance,[30,36,48] enhance immune function by decreasing exercise induced neutrophil degranulation,[31] speed the recovery of neuromuscular functions after heavy training[32] and increase the cell signaling related to protein synthesis,[36] all compared to placebo and/or no immediate pre and post exercise/training feedings.

Typical Use

- A healthy, convenient food replacement designed to be integrated into your daily meal planning in

order to assist you in reaching and maintaining your sport and fitness goals
- Pre- and post-workout feeding to maximize energy, muscle building and recovery. And can be made to any specifications (i.e. may add ingredients to achieve the desired level of calories protein, fats & CHO)
- Supply nutrient-rich, convenient snacks between meals to boost energy, curb hunger and assist in weight control by controlling calories
- Increase daily caloric intake when unable to do so by consuming whole food

Summary

Purpose

The Pre/Post Workout Formula is a healthy, convenient food replacement designed to be integrated into your daily meal planning in order to assist you in reaching and maintaining your sport and fitness goals, provide pre- and post-workout nutrients to maximize energy, muscle building and recovery, and can be made to any specifications (i.e. may add ingredients to achieve the desired level of calories protein, fats & CHO). Additionally the Pre/Post Workout Formula can supply a nutrient-rich, convenient snack between meals to boost energy, curb hunger and assist in weight control by controlling calories. dotFIT Pre/Post Workout Formula can be used to meet daily caloric needs when unable to do so by consuming whole food.

Unique Features

- Perfect blend of the highest quality proteins (whey protein isolate, whey protein concentrate, calcium caseinate, and micellar casein)
- Ideal blend of fast- and continuous-acting carbohydrates for quick and steady energy and recovery with only three grams of sugar per serving and NO ASPARTAME
- Healthy blend of essential fats
- Designed in a synergistic relationship with all dotFIT products and a person's traditional food intake. It is NOT spiked with unnecessary nutrients. Most other products in this space (e.g. bars, shakes, ready to drinks, etc.) are heavily spiked with many nutrients, leading to undesirable levels within the body when combining multiple manufacturers, products and normal food intake
- Because of our product synergy, use of our complete product line promotes safe and optimal daily nutrient intake
- Formulated and manufactured for great taste and pleasing texture in an FDA-registered facility, in compliance with Good Manufacturing Practices and maintains rigorous product testing

Nutrition Facts

Serving Size: 2 Scoops (65 g)
Servings Per Container: About 176
Calories 250
Fat Cal. 30

Amount Per Serving		% Daily Value *
Total Fat	**3 g**	**5%**
Saturated Fat	1 g	5%
Trans Fat	0 g	**
Cholesterol	**30 mg**	**10%**
Sodium	**260 mg**	**11%**
Total Carbohydrate	**37 g**	**12%**
Dietary Fiber	3 g	12%
Sugars	2 g	**
Protein	**20 g**	**40%**
Vitamin A (as Beta Carotene)	500 IU	10%
Vitamin C (as Ascorbic acid)	6 mg	10%
Calcium (as Calcium Lactate Gluconate)	200 mg	20%
Iron (as Ferrous Sulfate)	1.8 mg	10%
Vitamin D (as Cholecalciferol)	40 IU	10%
Vitamin E (as Succinate)	3 IU	10%
Thiamin (as Thiamin Hydrochloride)	.15 mg	10%
Riboflavin	.17 mg	10%
Niacin (as Niacinamide)	2 mg	10%
Vitamin B6 (as Pyridoxine Hydrochloride)	.2 mg	10%
Vitamin B12 (as Cyanocobalamin)	.6 mcg	10%
Biotin	30 mcg	10%
Pantothenic acid (as D-Calcium Pantothenate)	1 mg	10%
Iodine (as Potassium Iodide)	15 mcg	10%
Magnesium (as Magnesium Oxide)	40 mg	10%
Zinc (as Zinc Sulfate)	1.5 mg	10%
Copper (as Copper Gluconate)	.2 mg	10%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Maltodextrin, Protein Blend (Whey Protein Concentrate, Whey Protein Isolate, Micellar Casein, Calcium Caseinate), Dutch Processed Cocoa, Fat blend (High Oleic Sunflower oil, Medium Chain Triglyceride oil, Safflower oil), Natural and Artificial flavors, Carboxymethylcellulose gum, Vitamin and Mineral blend (Calcium Lactate Gluconate, Magnesium Phosphate, Ascorbic acid, Vitamin E Succinate, Niacinamide, Ferrous Sulfate, Zinc Sulfate, Pantothenic acid, Beta Carotene, Pyridoxine HCl, Copper Gluconate, Riboflavin, Thiamin HCl, Biotin, Potassium Iodide, Cyanocobalamin, Vitamin D [Cholecalciferol]), Salt, Sucralose, Acesulfame Potassium, Xanthan gum.

Contains: Milk

	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Saturated Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Potassium	3,500mg	3,500mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g
Calories per gram:	Fat 9 • Carbohydrate 4 • Protein 4	

Allergen Statement: Contains Milk. Produced in a facility that also processes egg, soy and shellfish.

Contains No: Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Starch, Artificial coloring or Preservatives added.

References

1 Heymsfield SB, van Mierlo CA, van der Knaap HC, Heo M, Frier HI. Weight management using a meal replacement strategy: meta and pooling analysis from six studies. Int J Obes Relat Metab Disord. 2003 May;27(5):537-49.
2 Ashley JM, St Jeor ST, Perumean-Chaney S, Schrage J, Bovee V. Meal replacements in weight intervention. Obes Res. 2001Nov;9 Suppl 4:312S-320S.
3 Ditschuneit HH. Do meal replacement drinks have a role in diabetes management? Nestle Nutr Workshop Ser Clin Perform Programme. 2006;11:171-9; discussion 179-81. Review.
4 Li Z, Hong K, Saltsman P, DeShields S, Bellman M, Thames G, Liu Y, Wang HJ, Elashoff R, Heber D. Long-term efficacy of soy based meal replacements vs an individualized diet plan in obese type II DM patients: relative effects on weight loss, metabolic parameters, and C-reactive protein. Eur J Clin Nutr. 2005 Mar;59(3):411-8.
5 Poston WS, Haddock CK, Pinkston MM, Pace P, Karakoc ND, Reeves RS, Foreyt JP. Weight loss with meal replacement and meal replacement plus snacks: a randomized trial. Int J Obes (Lond). 2005 Sep;29(9):1107-14.
6 Cheskin LJ, Mitchell AM, Jhaveri AD, Mitola AH, Davis LM, Lewis RA, Yep MA, Lycan TW. Efficacy of meal replacements versus a standard food-based diet for weight loss in type 2 diabetes: a controlled clinical trial. Diabetes Educ. 2008 Jan-Feb;34(1):118-27.
7 Wal JS, McBurney MI, Cho S, Dhurandhar NV. Ready-to-eat cereal products as meal replacements for weight loss. Int J Food Sci Nutr. 2007 Aug;58(5):331-40.
8 Smith TJ, Sigrist LD, Bathalon GP, McGraw S, Karl JP, Young AJ. Efficacy of a meal-replacement program for promoting blood lipid changes and weight and body fat loss in US Army soldiers. J Am Diet Assoc. 2010 Feb;110(2):268-73.
9 Flechtner-Mors M, Boehm BO, Wittmann R, Thoma U, Ditschuneit HH. Enhanced weight loss with protein-enriched meal replacements in subjects with the metabolic syndrome. Diabetes Metab Res Rev. 2010 Jul;26(5):393-405.
10 Hamdy O, Zwiefelhofer D. Weight management using a meal replacement strategy in type 2 diabetes. Curr Diab Rep. 2010 Apr;10(2):159-64. Review.
11 Jeffery RW, Wing RR, Thorson C, Burton LR, Raether C, Harvey J, Mullen M. Strengthening behavioral interventions for weight loss: a randomized trial of food provision and monetary incentives. J Consult Clin Psychol. 1993 Dec;61(6):1038-45
12 McCarron DA, Oparil S, Chait A, Haynes RB, Kris-Etherton P, Stern JS, Resnick LM, Clark S, Morris CD, Hatton DC, Metz JA, McMahon M, Holcomb S, Snyder GW, Pi-Sunyer FX. Nutritional management of cardiovascular risk factors. A randomized clinical trial. Arch Intern Med. 1997 Jan 27;157(2):169-77.
13 Wing RR, Jeffery RW. Food provision as a strategy to promote weight loss. Obes Res. 2001 Nov;9 Suppl 4:271S-275S. Review.
14 Wing RR, Jeffery RW, Burton LR, Thorson C, Nissinoff KS, Baxter JE. Food provision vs structured meal plans in the behavioral treatment of obesity. Int J Obes Relat Metab Disord. 1996 Jan;20(1):56-62.
15 Wadden TA, Butryn ML, Wilson C. Lifestyle modification for the management of obesity. Gastroenterology. 2007 May;132(6):2226-38. Review. Erratum in: Gastroenterology. 2007 Jul;133(1):371.
16 Berkel LA, Poston WS, Reeves RS, Foreyt JP. Behavioral interventions for obesity. J Am Diet Assoc. 2005 May;105(5 Suppl1):S35-43. Review.
17 Stull AJ, Apolzan JW, Thalacker-Mercer AE, Iglay HB, Campbell WW. Liquid and solid meal replacement products differentially affect postprandial appetite and food intake in older adults. J Am Diet Assoc. 2008 Jul;108(7):1226-30.
18 Ashley JM, Herzog H, Clodfelter S, Bovee V, Schrage J, Pritsos C. Nutrient adequacy during weight loss interventions: a randomized study in women comparing the dietary intake in a meal replacement group with a traditional food group. Nutr J. 2007 Jun 25;6:12.
19 Abbot JM, Thomson CA, Ranger-Moore J, Teixeira PJ, Lohman TG, Taren DL, Cussler E, Going SB, Houtkooper LB. Psychosocial and behavioral profile and predictors of self-reported energy underreporting in obese middle-aged women. J Am Diet Assoc. 2008 Jan;108(1):114-9.
20 Levitsky DA, Youn T. The more food young adults are served, the more they overeat. J Nutr. 2004 Oct;134(10):2546-9.
21 Wansink B, Painter JE, North J. Bottomless bowls: why visual cues of portion size may influence intake. Obes Res. 2005 Jan;13(1):93-100.
22 Rolls BJ, Roe LS, Meengs JS. Reductions in portion size and energy density of foods are additive and

lead to sustained decreases in energy intake. Am J Clin Nutr. 2006 Jan;83(1):11-7.
23 Gordon-Larsen P, Nelson MC, Popkin BM. Longitudinal physical activity and sedentary behavior trends: adolescence to adulthood. Am J Prev Med. 2004 Nov;27(4):277-83. Erratum in: Am J Prev Med. 2005 Jun;28(5):496. Am J Prev Med. 2006 Oct;31(4):353.
24 Rasmussen BB, Tipton KD, Miller SL, Wolf SE, Wolfe RR. An oral essential amino acid-carbohydrate supplement enhances muscle protein anabolism after resistance exercise. J Appl Physiol. 2000 Feb;88(2):386-92.
25 Baty JJ, Hwang H, Ding Z, Bernard JR, Wang B, Kwon B, Ivy JL. The effect of a carbohydrate and protein supplement on resistance exercise performance, hormonal response, and muscle damage. J Strength Cond Res. 2007 May;21(2):321-9.
26 Cribb PJ, Hayes A. Effects of supplement timing and resistance exercise on skeletal muscle hypertrophy. Med Sci Sports Exerc. 2006 Nov;38(11):1918-25.
27 Cockburn E, Stevenson E, Hayes PR, Robson-Ansley P, Howatson G. Effect of milk-based carbohydrate-protein supplement timing on the attenuation of exercise-induced muscle damage. Appl Physiol Nutr Metab. 2010 Jun;35(3):270-7.
28 Beelen M, Burke LM, Gibala MJ, van Loon L JC. Nutritional strategies to promote postexercise recovery. Int J Sport Nutr Exerc Metab. 2010 Dec;20(6):515-32.
29 Tipton KD, Rasmussen BB, Miller SL, Wolf SE, Owens-Stovall SK, Petrini BE, Wolfe RR. Timing of amino acid-carbohydrate ingestion alters anabolic response of muscle to resistance exercise. Am J Physiol Endocrinol Metab. 2001 Aug;281(2):E197-206.
30 Cathcart AJ, Murgatroyd SR, McNab A, Whyte LJ, Easton C. Combined carbohydrate-protein supplementation improves competitive endurance exercise performance in the heat. Eur J Appl Physiol. 2011 Jan 23. [Epub ahead of print]
31 Costa RJ, Oliver SJ, Laing SJ, Waiters R, Bilzon JL, Walsh NP. Influence of timing of postexercise carbohydrate-protein ingestion on selected immune indices. Int J Sport Nutr Exerc Metab. 2009 Aug;19(4):366-84.
32 Blacker SD, Williams NC, Fallowfield JL, Bilzon JLj, Willems ME. Carbohydrate vs protein supplementation for recovery of neuromuscular function following prolonged load carriage. J Int Soc Sports Nutr. 2010 Jan 12;7:2.
33 Koopman R, Wagenmakers AJ, Manders RJ, Zorenc AH, Senden JM, Gorselink M, Keizer HA, van Loon LJ. Combined ingestion of protein and free leucine with carbohydrate increases postexercise muscle protein synthesis in vivo in male subjects. Am J Physiol Endocrinol Metab. 2005 Apr;288(4):E645-53. Epub 2004 Nov 23.
34 Esmarck B, Andersen JL, Olsen S, Richter EA, Mizuno M, Kjaer M. Timing of postexercise protein intake is important for muscle hypertrophy with resistance training in elderly humans. J Physiol. 2001 Aug 15;535(Pt 1):301-11.
35 Betts JA, Williams C. Short-term recovery from prolonged exercise: exploring the potential for protein ingestion to accentuate the benefits of carbohydrate supplements. Sports Med. 2010 Nov 1;40(11):941-59. doi: 10.2165/11536900-000000000-00000.
36 Coffey VG, Moore DR, Burd NA, Rerecich T, Stellingwerff T, Garnham AP, Phillips SM, Hawley JA. Nutrient provision increases signalling and protein synthesis in human skeletal muscle after repeated sprints. Eur J Appl Physiol. 2010 Dec 17. [Epub ahead of print]
37 Bird SP, Tarpenning KM, Marino FE. Liquid carbohydrate/essential amino acid ingestion during a short-term bout of resistance exercise suppresses myofibrillar protein degradation. Metabolism. 2006 May;55(5):570-7.
38 Baty JJ, Hwang H, Ding Z, Bernard JR, Wang B, Kwon B, Ivy JL. The effect of a carbohydrate and protein supplement on resistance exercise performance, hormonal response, and muscle damage. J Strength Cond Res. 2007 May;21(2):321-9.
39 Paddon-Jones D, Sheffield-Moore M, Aarsland A, Wolfe RR, Ferrando AA. Exogenous amino acids stimulate human muscle anabolism without interfering with the response to mixed meal ingestion. Am J Physiol Endocrinol Metab. 2005 Apr;288(4):E761-7. Epub 2004 Nov 30.
40 Cockburn E, Hayes PR, French DN, Stevenson E, St Clair Gibson A. Acute milk-based protein-CHO supplementation attenuates exercise-induced muscle damage. Appl Physiol Nutr Metab. 2008 Aug;33(4):775-83.
41 Luden ND, Saunders MJ, Todd MK. Postexercise carbohydrate-protein- antioxidant ingestion decreases plasma creatine kinase and muscle soreness. Int J Sport Nutr Exerc Metab. 2007 Feb;17(1):109-23.

42 Millard-Stafford M, Childers WL, Conger SA, Kampfer AJ, Rahnert JA. Recovery nutrition: timing and composition after endurance exercise. Curr Sports Med Rep. 2008 Jul-Aug;7(4):193-201. Review.
43 Campbell C, Prince D, Braun M, Applegate E, Casazza GA. Carbohydrate-supplement form and exercise performance. Int J Sport Nutr Exerc Metab. 2008 Apr;18(2):179-90.
44 Jentjens RL, Underwood K, Achten J, Currell K, Mann CH, Jeukendrup AE. Exogenous carbohydrate oxidation rates are elevated after combined ingestion of glucose and fructose during exercise in the heat. J Appl Physiol. 2006 Mar;100(3):807-16. Epub 2005 Nov 10.
45 Dreyer HC, Drummond MJ, Pennings B, Fujita S, Glynn EL, Chinkes DL, Dhanani S, Volpi E, Rasmussen BB. Leucine-enriched essential amino acid and carbohydrate ingestion following resistance exercise enhances mTOR signaling and protein synthesis in human muscle. Am J Physiol Endocrinol Metab. 2008 Feb;294(2):E392-400. Epub 2007 Dec 4.
46 Miller SL, Tipton KD, Chinkes DL, Wolf SE, Wolfe RR. Independent and combined effects of amino acids and glucose after resistance exercise. Med Sci Sports Exerc. 2003 Mar;35(3):449-55.
47 Kimball SR, Farrell PA, Jefferson LS. Invited Review: Role of insulin in translational control of protein synthesis in skeletal muscle by amino acids or exercise. J Appl Physiol. 2002 Sep;93(3):1168-80. Review.
48 Saunders MJ, Moore RW, Kies AK, Luden ND, Pratt CA. Carbohydrate and protein hydrolysate co-ingestions improvement of late-exercise time-trial performance. Int J Sport Nutr Exerc Metab. 2009 Apr;19(2):136-49.

FirstString™

Goal

The goal of FirstString is to provide the ideal formula containing a mix of protein (P), carbohydrates (CHO) and fats (F) that meet the NCAA and Pro Sports guidelines (NCAA Bylaw 16.5.2.2) for college and professional athletes. This is while satisfying the established criteria of a pre- and post- exercise/activity meal needed to maximize the training response, thereby leading to greater gains in strength, size and/or performance and competition outcomes. FirstString is also NSF Certified For Sport, which is a separate testing and certification program that assures all amateur and professional athletes that the products (and respective manufacturing facilities) are pure, safe and free of banned substances. The NSF Prohibited Substances List includes banned substances identified by leading sports organizations, such as the World Anti-Doping Agency (WADA), the National Football League (NFL) and Major League Baseball (MLB).

The NSF Certified for Sport™ Program certifies products and inspects facilities for a range of substances. NSF's history of independence led to a partnership with the National Football League (NFL) and the NFL Players Association to develop and administer the NFL/NFLPA Supplement Certification Program, a first-of-its-kind program designed especially for professional football. Visit the NSF website for more on NSF Certification program http://www.nsf.org/business/athletic_banned_substances/index.asp?program=AthleticBanSub.

For more on pre- and post-training formulas and meal replacements, see the nutrition dotFIT overview.

Rationale

Proper diet manipulations with specialized formulas create and take advantage of "metabolic windows" throughout the day where muscle cells become highly receptive to the nutrients necessary to maximize recovery[1,2,3,4,5,6] and those used to increase protein synthesis,[7,8,9,10,11,12] specifically before and after training.[3,9,13,14,15,16,17]

Proper timing and composition of nutrients can trigger a hormonal state that can reduce muscle damage while increasing muscle building, leading to a greater net increase in protein synthesis when compared to normal feeding patterns with equal diet components (total calories, protein, fats and carbohydrates).[18,19,20,21] Accomplishing the ideal hormonal environment for muscle building is a function of carbohydrates (CHO), proteins and fats being supplied in proper ratios, forms and at specific times in relation to training periods.[5,17,22] FirstString delivers these macronutrients in the proper form and amounts that have been demonstrated by numerous clinical trials to enhance training results when compared to a non-supplemented state.

An approximate 2:1 ratio of CHO to protein, as in FirstString, has been shown to enhance protein synthesis when used post-training compared to placebo.[4,17,21,23,24,25,26]

Recently pre- and post-feedings of carbohydrate and protein have also demonstrated the abilities to reduce delayed onset of muscle soreness (DOMS),[5,6,27] improve competitive performance,[17,27,28] enhance immune function by decreasing exercise induced neutrophil degranulation,[29] speed the recovery of neuromuscular functions after heavy training[30] and increase the cell signaling related to protein synthesis,[17] all compared to placebo and/or no immediate pre and post exercise/training feedings.

Typical Use

As a pre- and post-workout supplement, each training day (dose ranges based on size), 10-40 minutes pre-workout:

- Under 200 lbs, consume two scoops; over 200 lbs, consume four scoops
- Immediately following training, repeat the same dose
- As a meal replacement or weight gain supplement use as needed throughout the day to meet individual calorie and nutrient goals

Summary

Purpose

- The base product is a higher calorie and CHO to protein ratio per serving than other dotFIT powders, allowing the product to serve multiple roles: pre/post-training supplement, weight gainer and meal replacement
- Targeted to all athletes but primarily marketed to the youth, college and professional athletes since it is NCAA approved and NSF Certified. As a supplement FirstString can help maximize a child's athletic development including overall growth potential; it is a natural and safe product for the youth population
- The 42 grams of the best quality proteins (see WheySmooth™ for info on proteins) and 86 grams of CHO packed into 570 calories (vanilla flavor) make FirstString™ the perfect muscle gain formula
- Can deliver exactly what's needed so surplus nutrients/calories are incorporated into muscle tissues rather than body fat when appropriate resistance exercise is included and total daily calories are appropriate

Unique Features

- Contains Aminogen®, which has been shown to increase the body's uptake of amino acids/protein, making greater amounts available to the working muscles and decrease in incidences of bloating/gas common with competitive products
- CHO content satisfies the necessary profile for maximizing protein synthesis while fitting into a "low sugar" claim, which will appeal to prevailing perceptions
- 42 grams of protein, 86 grams of CHO and only eight grams of sugar (vanilla flavor)
- No aspartame and relatively low sodium
- Sophisticated ideal blend of the highest quality fast and slow acting proteins
- dotFIT meal replacements (nutrition dotFIT) are designed in a synergistic relationship with all dotFIT products and a person's traditional food intake. These products are NOT spiked with unnecessary nutrients. Most other products in this space (e.g. bars, shakes, ready-to-drinks, etc.) are heavily spiked with many nutrients that can lead to undesirable levels within the body when combining multiple manufacturers, products and normal food intake
- When consuming only dotFIT products as directed with one's normal daily food intake, the recipient is assured of keeping the body at a safe and optimal nutrient level
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Nutrition Facts

Serving Size:	2 Scoops (75g)		4 Scoops (150g)	
Servings Per Container:	About 32		About 16	
	Calories 295	Fat Cal. 25	**Calories** 590	Fat Cal. 50
Amount Per Serving		**% Daily Value**	**Amount Per Serving**	**% Daily Value**
Total Fat	**3 g**	**4.5%**	**6 g**	**9%**
Saturated Fat	1 g	0%	2 g	0%
Trans Fat	0 g	**	0 g	**
Cholesterol	**60 mg**	**10%**	**120 mg**	**20%**
Sodium	**225 mg**	**9.5%**	**450 mg**	**19%**
Total Carbohydrate	**46 g**	**15.5%**	**92 g**	**31%**
Dietary Fiber	2.5 g	10%	5 g	20%
Sugars	2 g	**	4 g	**
Protein	**21 g**	**42%**	**42 g**	**84%**
Vitamin A (as Beta Carotene)	250 IU	5%	500 IU	10%
Vitamin C (as Ascorbic acid)	3 mg	5%	6 mg	10%
Vitamin D (as Cholecalciferol)	20 IU	5%	40 IU	10%
Vitamin E (as D-Alpha Tocopheryl succinate)	1.5 IU	5%	3 IU	10%
Thiamin (as thiamine hydrochloride)	0.075 mg	5%	0.15 mg	10%
Riboflavin	0.085 mg	5%	0.17 mg	10%
Niacin (as Niacinamide)	1 mg	5%	2 mg	10%
Vitamin B6 (as Pyridoxine HCl)	0.1 mg	5%	0.2 mg	10%
Vitamin B12 (as Cyanocobalamin)	0.3 mcg	5%	0.6 mcg	10%
Biotin	15 mcg	5%	30 mcg	10%
Pantothenic acid (as d-Calcium Pantothenate)	0.5 mg	5%	1 mg	10%
Calcium (from Milk Protein and Carbonate)	150 mg	15%	300 mg	30%
Iron (as Ferrous Sulfate)	2.25 mg	12.5%	4.5 mg	25%
Iodine (as Potassium Iodide)	7.5 mcg	5%	15 mcg	10%
Magnesium (as Magnesium Phosphate)	20 mg	5%	40 mg	10%
Zinc (as Zinc Sulfate)	0.75 mg	5%	1.5 mg	10%
Copper (as Copper Gluconate)	0.1 mg	5%	0.2 mg	10%
Aminogen® (13 Units)	125 mg	**	250 mg	**

	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Saturated Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Potassium	3,500mg	3,500mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

* % Daily Value not established.
**Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Other Ingredients: Maltodextrin, Protein Blend (Whey Protein Concentrate, Whey Protein Isolate, Micellar Casein, Calcium Caseinate, Aminogen®), Dutch Processed Cocoa, Fat blend (High Oleic Sunflower oil, Medium Chain Triglyceride oil, Safflower oil), Natural and Artificial flavors, Carboxymethylcellulose gum, Vitamin and Mineral blend (Calcium Lactate Gluconate, Magnesium Phosphate, Ascorbic acid, Vitamin E Succinate, Niacinamide, Ferrous Sulfate, Zinc Sulfate, Pantothenic acid, Beta Carotene, Pyridoxine HCl, Copper Gluconate, Riboflavin, Thiamin HCl, Biotin, Potassium Iodide, Cyanocobalamin, Vitamin D (Cholcalciferol), Salt, Sucralose, Acesulfame Potassium, Xanthan gum.

Allergen Statement: Contains Milk. Produced in a facility that also processes egg, and shellfish.

Contains: Derived from Milk and Soy.

Contains No: Fish, Crustacean Shellfish, Tree nuts, Peanuts, or Gluten. No Salt, Starch, Artificial coloring or Preservatives added.

References

1 van Loon LJ, Saris WH, Kruijshoop M, Wagenmakers AJ. Maximizing postexercise muscle glycogen synthesis: carbohydrate supplementation and the application of amino acid or protein hydrolysate mixtures. Am J Clin Nutr. 2000 Jul;72(1):106-11.
2 Millard-Stafford M, Childers WL, Conger SA, Kampfer AJ, Rahnert JA. Recovery nutrition: timing and composition after endurance exercise. Curr Sports Med Rep. 2008 Jul-Aug;7(4):193-201. Review.
3 Ivy JL, Goforth HW Jr, Damon BM, McCauley TR, Parsons EC, Price TB. Early postexercise muscle glycogen recovery is enhanced with a carbohydrate-protein supplement. J Appl Physiol. 2002 Oct;93(4):1337-44.
4 Berardi JM, Price TB, Noreen EE, Lemon PW. Postexercise muscle glycogen recovery enhanced with a carbohydrate-protein supplement. Med Sci Sports Exerc. 2006 Jun;38(6):1106-13.
5 Cockburn E, Stevenson E, Hayes PR, Robson-Ansley P, Howatson G. Effect of milk-based carbohydrate-protein supplement timing on the attenuation of exercise-induced muscle damage. Appl Physiol Nutr Metab. 2010 Jun;35(3):270-7.
6 Betts JA, Williams C. Short-term recovery from prolonged exercise: exploring the potential for protein ingestion to accentuate the benefits of carbohydrate supplements. Sports Med. 2010 Nov 1;40(11):941-59. doi: 10.2165/11536900-000000000-00000.
7 Levenhagen DK, Gresham JD, Carlson MG, Maron DJ, Borel MJ, Flakoll PJ. Postexercise nutrient intake timing in humans is critical to recovery of leg glucose and protein homeostasis. Am J Physiol Endocrinol Metab. 2001 Jun;280(6):E982-93.
8 Levenhagen DK, Carr C, Carlson MG, Maron DJ, Borel MJ, Flakoll PJ. Postexercise protein intake enhances whole-body and leg protein accretion in humans. Med Sci Sports Exerc. 2002 May;34(5):828-37.
9 Tipton KD, Elliott TA, Cree MG, Wolf SE, Sanford AP, Wolfe RR. Ingestion of casein and whey proteins result in muscle anabolism after resistance exercise. Med Sci Sports Exerc. 2004 Dec;36(12):2073-81.
10 Tipton KD, Elliott TA, Cree MG, Aarsland AA, Sanford AP, Wolfe RR. Stimulation of net muscle protein synthesis by whey protein ingestion before and after exercise. Am J Physiol Endocrinol Metab. 2007 Jan;292(1):E71-6. Epub 2006 Aug 8.
11 Koopman R, Saris WH, Wagenmakers AJ, van Loon LJ. Nutritional interventions to promote post-exercise muscle protein synthesis. Sports Med. 2007;37(10):895-906. Review.
12 Borsheim E, Aarsland A, Wolfe RR. Effect of an amino acid, protein, and carbohydrate mixture on net muscle protein balance after resistance exercise. Int J Sport Nutr Exerc Metab. 2004 Jun;14(3):255-71.
13 Tipton KD, Rasmussen BB, Miller SL, Wolf SE, Owens-Stovall SK, Petrini BE, Wolfe RR. Timing of amino acid-carbohydrate ingestion alters anabolic response of muscle to resistance exercise. Am J Physiol Endocrinol Metab. 2001 Aug;281(2):E197-206.
14 Koopman R, Wagenmakers AJ, Manders RJ, Zorenc AH, Senden JM, Gorselink M, Keizer HA, van Loon LJ. Combined ingestion of protein and free leucine with carbohydrate increases postexercise muscle protein synthesis in vivo in male subjects. Am J Physiol Endocrinol Metab. 2005 Apr;288(4):E645-53. Epub 2004 Nov 23.
15 Miller BF. Human muscle protein synthesis after physical activity and feeding. Exerc Sport Sci Rev. 2007 Apr;35(2):50-5. Review.
16 Lemon PW, Berardi JM, Noreen EE. The role of protein and amino acid supplements in the athlete's diet: does type or timing of ingestion matter? Curr Sports Med Rep. 2002 Aug;1(4):214-21. Review.
17 Coffey VG, Moore DR, Burd NA, Rerecich T, Stellingwerff T, Garnham AP, Phillips SM, Hawley JA. Nutrient provision increases signalling and protein synthesis in human skeletal muscle after repeated sprints. Eur J Appl Physiol. 2010 Dec 17. [Epub ahead of print]
18 Miller SL, Tipton KD, Chinkes DL, Wolf SE, Wolfe RR. Independent and combined effects of amino acids and glucose after resistance exercise. Med Sci Sports Exerc. 2003 Mar;35(3):449-55.
19 Tipton KD, Borsheim E, Wolf SE, Sanford AP, Wolfe RR. Acute response of net muscle protein balance reflects 24-h balance after exercise and amino acid ingestion. Am J Physiol Endocrinol Metab. 2003 Jan;284(1):E76-89. Epub 2002 Sep 11.
20 Cribb PJ, Hayes A. Effects of supplement timing and resistance exercise on skeletal muscle hypertrophy. Med Sci Sports Exerc. 2006 Nov;38(11):1918-25.
21 Beelen M, Burke LM, Gibala MJ, van Loon L JC. Nutritional strategies to promote postexercise recovery. Int J Sport Nutr Exerc Metab. 2010 Dec;20(6):515-32.
22 Suzuki M. Glycemic carbohydrates consumed with amino acids or protein right after exercise enhance muscle formation. Nutr Rev. 2003 May;61(5 Pt 2):S88-94. Review.
23 Koopman R, Wagenmakers AJ, Manders RJ, Zorenc AH, Senden JM, Gorselink M, Keizer HA, van Loon LJ. Combined ingestion of protein and free leucine with carbohydrate increases postexercise muscle protein

synthesis in vivo in male subjects. Am J Physiol Endocrinol Metab. 2005 Apr;288(4):E645-53. Epub 2004 Nov 23.
24 Manders RJ, Wagenmakers AJ, Koopman R, Zorenc AH, Menheere PP, Schaper NC, Saris WH, van Loon LJ. Co-ingestion of a protein hydrolysate and amino acid mixture with carbohydrate improves plasma glucose disposal in patients with type 2 diabetes. Am J Clin Nutr. 2005 Jul;82(1):76-83.
25 Koopman R, Beelen M, Stellingwerff T, Pennings B, Saris WH, Kies AK, Kuipers H, van Loon LJ. Coingestion of carbohydrate with protein does not further augment postexercise muscle protein synthesis. Am J Physiol Endocrinol Metab. 2007 Sep;293(3):E833-42. Epub 2007 Jul 3.
26 van Loon LJ, Saris WH, Kruijshoop M, Wagenmakers AJ. Maximizing postexercise muscle glycogen synthesis: carbohydrate supplementation and the application of amino acid or protein hydrolysate mixtures. Am J Clin Nutr. 2000 Jul;72(1):106-11.
27 Saunders MJ, Moore RW, Kies AK, Luden ND, Pratt CA. Carbohydrate and protein hydrolysate coingestions improvement of late-exercise time-trial performance. Int J Sport Nutr Exerc Metab. 2009 Apr;19(2):136-49.
28 Cathcart AJ, Murgatroyd SR, McNab A, Whyte LJ, Easton C. Combined carbohydrate-protein supplementation improves competitive endurance exercise performance in the heat. Eur J Appl Physiol. 2011 Jan 23. [Epub ahead of print]
29 Costa RJ, Oliver SJ, Laing SJ, Waiters R, Bilzon JL, Walsh NP. Influence of timing of postexercise carbohydrate-protein ingestion on selected immune indices. Int J Sport Nutr Exerc Metab. 2009 Aug;19(4):366-84.
30 Blacker SD, Williams NC, Fallowfield JL, Bilzon JLj, Willems ME. Carbohydrate vs protein supplementation for recovery of neuromuscular function following prolonged load carriage. J Int Soc Sports Nutr. 2010 Jan 12;7:2.

WheySmooth™

Goal

WheySmooth is designed to deliver a high quality protein (PRO) source, rich in essential amino acids, which allows a high protein intake even during a low calorie diet. WheySmooth comes in a powdered form allowing the user to mix and adjust the total protein and other nutrient content as needed/desired. Whey proteins can be useful for improving training outcomes by 1) increasing protein intake when whole food sources are insufficient or not an option (i.e. early morning workouts or low-calorie diets); 2) maximizing lean muscle mass in exercising or dieting adults; 3) hastening and improving recovery from exercise bouts; and 4) supporting immune function during high volume training.

Rationale

Timed ingestion of whey protein both pre- and post-workout[1,2,3,4,5] facilitates a more rapid absorption of amino acids into the bloodstream and their subsequent delivery to the target tissues when compared to other sources of proteins.[6,7,8,9,10] Whey protein hydrolysates have the highest content of essential and branched chain amino acids of any protein and yield small peptides that are absorbed quickly into the blood stream.[10,11,12,13,14] For bodybuilders, wrestlers, or other weight-conscious athletes preparing for competition (these athletes are often underfed and overtrained at this point), these formulas offer a viable way to meet protein and amino acid requirements for maintaining and increasing lean mass while calorie intake remains low enough to accomplish the body composition or weight goals.[10,14,15,16]

As exercise intensity and volume increase, muscle amino acid and glycogen stores are depleted.[15,17,18,19,20] This can induce a catabolic state in the athlete and impair recovery if adequate post-exercise nutrition is not available.[11] Zawadski et al showed that the addition of whey protein to a carbohydrate (CHO) drink, post-workout, accelerated muscle glycogen synthesis compared to CHO alone.[21] The result may be attributed to a greater insulin response to the CHO/PRO combination than with CHO alone (see Figure 6). Both protein/CHO solutions used whey as the protein source and as you can see, the addition of leucine further increased the insulin response. Insulin is a powerful anabolic hormone necessary for stimulating muscle protein synthesis (MPS).[22,23,24,25,26,27,28,29] It is widely accepted in the scientific community that resistance training (RT) increases muscle protein synthesis (MPS).[18,30,31,32] Research has firmly established that the combination of RT and whey protein ingestion produces a synergistic effect on muscle hypertrophy by supplying a unique grouping of essential amino acids (specifically leucine) post-RT to initiate and enhance MPS.[33,34,35,36,37,38] The combination of whey protein's ability to accelerate glycogen resynthesis and stimulate MPS may significantly improve exercise recovery leading to greater training outcomes (e.g. muscle hypertrophy, sports performance, strength).

In summary, whey protein appears superior to other proteins based on its amino acid content (high in BCAA including Leucine) and its ability to increase MPS to a greater degree than other proteins and/or carbohydrates alone. The latter consequence may be due to whey's quick absorption time allowing it to arrive at the training-affected muscle tissues sooner within the all important 60-minute "metabolic window" of growth (see Pre/Post Workout Formula for more on metabolic windows) and possibly by whey protein's ability to uniquely trigger and prolong MPS in part by enhancing the phosphorylation of select proteins within the mammalian target of rapamycin (p70S6K, eEF2) and by activating proteins within the mitogen-activated protein kinase (ERK1/2, p90RSK) signaling.[5,14,39,40] When combining fast-acting whey protein with slower releasing casein proteins, you have the perfect protein combination for maximizing MPS.

Whey and immune system

Whey protein may help sustain the immune system during high-volume training cycles.[41,42] A high concentration of cysteine is found in whey protein, which is needed for glutathione production, a natural antioxidant found in the body.[43,44,45] Glutathione may assist in repairing damaged cells including cells of the immune system due to stressors, such as exercise and keep them running smoothly.[46,47,48] Proper use of whey proteins for certain athletes during intense training may significantly enhance the desired outcomes, especially if total calorie intake is being limited to allow the pursuit or maintenance of low body fat.

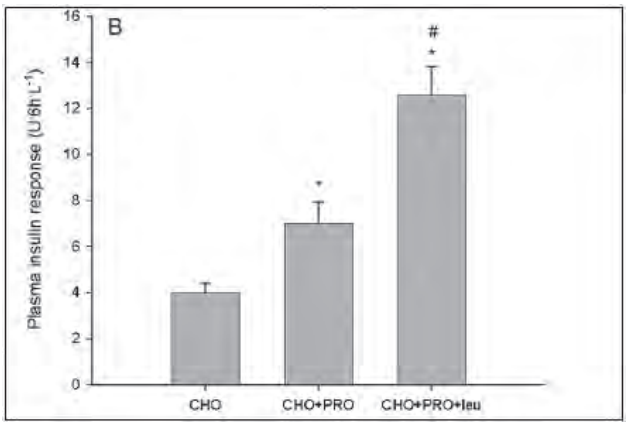

Figure 6: Insulin response to three different post-workout drinks.

WheySmooth

Precision formulated to improve body composition and enhance performance, dotFIT's WheySmooth is packed with a stunning 40 grams of medical-grade protein from five different, very high biological value sources (whey protein isolate, whey protein concentrate, egg albumin, calcium caseinate, micellar casein). WheySmooth's matrix of "slow" and "fast" releasing proteins and essential fatty acids help ensure WheySmooth provides the best of both worlds; keeping you and your muscles in an anabolic state all day long.

Co-factors

Pyridoxal 5' Phosphate (the active form of vitamin B6) is involved with a myriad of functions in the body, but of interest here is its role in protein metabolism (catabolism/anabolism) and immune function.[50]

Typical Use

WheySmooth™ is ideal for athletes or exercisers seeking to acquire the highest amount of protein with the least amount of calories in order to maximize training induced size, performance and strength outcomes.

- Adults who do not meet protein requirements from food intake, especially physique and other athletes (strength, endurance and active recreational) during an adaptation period
- Weight and body-fat conscious athletes during the final weeks of competition dieting, in order to meet protein requirements with fewer calories
- Underfed and over-trained athletes
- Anyone wanting a great tasting, convenient protein source
- Those concerned with proper timing of protein intake and want the quick digestibility that cannot be accomplished by traditional food sources

Precautions

Some studies have shown an increase in calcium loss with high protein intakes which may predispose the individual to an increased risk of osteoporosis.[51] However several, recent studies have found the link between protein intake and bone health to be positive.[52,53] The Institute of Medicine's and other related studies have concluded that levels of dietary protein are not associated with a decrease in renal function with age.[54,55,56,57]

Contraindications

WheySmooth is contraindicated in pregnancy and lactation unless protein needs cannot be met by food

alone. WheySmooth is contraindicated in people who cannot consume milk proteins.

Adverse Reactions

There should be no adverse effects in healthy users at the recommended doses.

Upper Limit/Toxicity

Currently there is no UL established for protein.

Summary

Purpose

Because of whey protein's structure, high essential amino acid content and bioavailability, this product is ideal for athletes or exercisers seeking to acquire the highest amount of protein with the least amount of calories in order to maximize training induced size, performance and strength outcomes.

Unique Features

- Forty grams of protein from the highest BV sources, giving WheySmooth its unique "fast and slow" release pattern
- Co-factors available to ensure greater amino acid and protein utilization
- Great taste, easy mixing
- No gas or bloating as is common with other protein powders
- Contains only 2 grams of sugar per serving and NO ASPARTAME
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Supplement Facts

Serving Size: 2 Scoops (63 g)
Servings Per Container: About 18
Calories 250
Fat Cal. 35

Amount Per Serving		% Daily Value*
Total Fat	**4 g**	**6%**
Saturated Fat	1.5g	8%
Trans Fat	0 g	**
Cholesterol	**120 mg**	**40%**
Sodium	**200 mg**	**8%**
Total Carbohydrate	**13 g**	**4%**
Dietary Fiber	2 g	8%
Sugars	3 g	**
Protein	**40 g**	**80%**
Vitamin A	0 IU	0%
Vitamin C	0 mg	0%
Calcium (from Milk Protein)	215 mg	22%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** Daily Value not established.

Other Ingredients: Protein Blend (Whey Protein Concentrate, Calcium Caseinate, Whey Protein Isolate, Egg White Protein, Micellar Casein), Cocoa Powder, Maltodextrin, High oleic Sunflower Oil, Carboxymethylcellulose gum, Natural and Artificial Flavors, Salt, Pyridoxine 5' Phosphate, Sucralose Acesulfame Potassium, Xanthan gum

Contains: Milk and Eggs

References

1 Tipton KD, Rasmussen BB, Miller SL, Wolf SE, Owens-Stovall SK, Petrini BE, Wolfe RR. Timing of amino acid-carbohydrate ingestion alters anabolic response of muscle to resistance exercise. Am J Physiol Endocrinol Metab. 2001 Aug;281(2):E197- 206.
2 Tipton KD, Elliott TA, Cree MG, Aarsland AA, Sanford AP, Wolfe RR. Stimulation of net muscle protein synthesis by whey protein ingestion before and after exercise. Am J Physiol Endocrinol Metab. 2007 Jan;292(1):E71-6. Epub 2006 Aug 8.
3 Tipton KD, Elliott TA, Cree MG, Wolf SE, Sanford AP, Wolfe RR. Ingestion of casein and whey proteins result in muscle anabolism after resistance exercise. Med Sci Sports Exerc. 2004 Dec;36(12):2073-81.
4 Cooke MB, Rybalka E, Stathis CG, Cribb PJ, Hayes A. Whey protein isolate attenuates strength decline after eccentrically-induced muscle damage in healthy individuals. J Int Soc Sports Nutr. 2010 Sep 22;7:30.
5 Moore DR, Atherton PJ, Rennie MJ, Tarnopolsky MA, Phillips SM. Resistance exercise enhances mTOR and MAPK signalling in human muscle over that seen at rest after bolus protein ingestion. Acta Physiol (Oxf). 2011 Mar;201(3):365-72. doi: 10.1111/j.1748-1716.2010.02187.x. Epub 2010 Nov 9.
6 Chittenden RH. The nutrition of man. London:
7 Bos C, Metges CC, Gaudichon C, Petzke KJ, Pueyo ME, Morens C, Everwand J, Benamouzig R, Tomé D. Postprandial kinetics of dietary amino acids are the main determinant of their metabolism after soy or milk protein ingestion in humans. J Nutr. 2003 May;133(5):1308-15.
8 Dangin M, Boirie Y, Garcia-Rodenas C, Gachon P, Fauquant J, Callier P, Ballèvre O, Beaufrère B. The digestion rate of protein is an independent regulating factor of postprandial protein retention. Am J Physiol Endocrinol Metab. 2001 Feb;280(2):E340-8.
9 Phillips SM, Tang JE, Moore DR. The role of milk- and soy-based protein in support of muscle protein synthesis and muscle protein accretion in young and elderly persons. J Am Coll Nutr. 2009 Aug;28(4):343-54. Review.
10 Tang JE, Moore DR, Kujbida GW, Tarnopolsky MA, Phillips SM. Ingestion of whey hydrolysate, casein, or soy protein isolate: effects on mixed muscle protein synthesis at rest and following resistance exercise in young men. J Appl Physiol. 2009 Sep;107(3):987-92. Epub 2009 Jul 9.
11 Luc J.C. van Loon Application of Protein or Protein Hydrolysates to Improve Postexercise Recovery.

Int J Sport Nutr Exerc Metab. 2007 August: 17(Supp): S104-S117
12 Gabriella A.M. Ten Have ; Marielle P.K.J. Engelen ;Yvette C. Luiking ; Nicolaas E.P. Deutz. Absorption Kinetics of Amino Acids, Peptides, and Intact Proteins . Int J Sport Nutr Exerc Metab. 2007 August: 17(Supp): S23-S36
13 Phillips SM. The science of muscle hypertrophy: making dietary protein count. Proc Nutr Soc. 2011 Feb;70(1):100-3. Epub 2010 Nov 22.
14 Hulmi JJ, Lockwood CM, Stout JR. Effect of protein/essential amino acids and resistance training on skeletal muscle hypertrophy: A case for whey protein. Nutr Metab (Lond). 2010 Jun 17;7:51.
15 Tipton KD, Witard OC. Protein requirements and recommendations for athletes: relevance of ivory tower arguments for practical recommendations. Clin Sports Med. 2007 Jan;26(1):17-36. Review.
16 Walker TB, Smith J, Herrera M, Lebegue B, Pinchak A, Fischer J. The influence of 8 weeks of whey-protein and leucine supplementation on physical and cognitive performance. Int J Sport Nutr Exerc Metab. 2010 Oct;20(5):409-17.
17 McKenzie S, Phillips SM, Carter SL, Lowther S, Gibala MJ, Tarnopolsky MA. Endurance exercise training attenuates leucineoxidation and BCOAD activation during exercise in humans. Am J PhysiolEndocrinol Metab. 2000 Apr;278(4):E580-7.
18 Phillips SM, Atkinson SA, Tarnopolsky MA, MacDougall JD. Gender differences in leucine kinetics and nitrogen balance in endurance athletes. J Appl Physiol. 1993 Nov;75(5):2134-41.
19 Lamont LS, Patel DG, Kalhan SC. Leucine kinetics in endurance-trained humans. J Appl Physiol. 1990 Jul;69(1):1-6.
20 Lamont LS, McCullough AJ, Kalhan SC. Gender differences in leucine, but not lysine, kinetics. J Appl Physiol. 2001 Jul;91(1):357-62.
21 Zawadzki KM, Yaspelkis BB 3rd, Ivy JL. Carbohydrate-protein complex increases the rate of muscle glycogen storage after exercise. J Appl Physiol. 1992 May;72(5):1854-9.
22 Biolo G, Williams BD, Fleming RY, Wolfe RR. Insulin action on muscle protein kinetics and amino acid transport during recovery after resistance exercise. Diabetes. 1999 May;48(5):949-57.

23 Kaastra B, Manders RJ, Van Breda E, Kies A, Jeukendrup AE, Keizer HA, Kuipers H, Van Loon LJ. Effects of increasing insulin secretion on acute postexercise blood glucose disposal. Med Sci Sports Exerc. 2006 Feb;38(2):268-75.
24 Fryburg DA, Jahn LA, Hill SA, Oliveras DM, Barrett EJ. Insulin and insulin-like growth factor-I enhance human skeletal muscle protein anabolism during hyperaminoacidemia by different mechanisms. J Clin Invest. 1995 Oct;96(4):1722-9.
25 Gelfand RA, Barrett EJ. Effect of physiologic hyperinsulinemia on skeletal muscle protein synthesis and breakdown in man. J Clin Invest. 1987 Jul;80(1):1-6.
26 Hillier TA, Fryburg DA, Jahn LA, Barrett EJ. Extreme hyperinsulinemia unmasks insulin's effect to stimulate protein synthesis in the human forearm. Am J Physiol. 1998 Jun;274(6 Pt 1):E1067-74.
27 van Loon LJ, Kruijshoop M, Verhagen H, Saris WH, Wagenmakers AJ. Ingestion of protein hydrolysate and amino acid carbohydrate mixtures increases postexercise plasma insulin responses in men. J Nutr. 2000 Oct;130(10):2508-13.
28 van Loon LJ, Saris WH, Kruijshoop M, Wagenmakers AJ. Maximizing postexercise muscle glycogen synthesis: carbohydrate supplementation and the application of amino acid or protein hydrolysate mixtures. Am J Clin Nutr. 2000 Jul;72(1):106-11.
29 Chow LS, Albright RC, Bigelow ML, Toffolo G, Cobelli C, Nair KS. Mechanism of insulin's anabolic effect on muscle: measurements of muscle protein synthesis and breakdown using aminoacyl-tRNA and other surrogate measures. Am J Physiol Endocrinol Metab. 2006 Oct;291(4):E729-36. Epub 2006 May 16.
30 Chesley A, MacDougall JD, Tarnopolsky MA, Atkinson SA, Smith K. Changes in human muscle protein synthesis after resistance exercise. J Appl Physiol. 1992 Oct;73(4):1383-8.
31 Phillips SM, Tipton KD, Aarsland A, Wolf SE, Wolfe RR. Mixed muscle protein synthesis and breakdown after resistance exercise in humans. Am J Physiol. 1997 Jul;273(1 Pt 1):E99-107.
32 Biolo G, Maggi SP, Williams BD, Tipton KD, Wolfe RR. Increased rates of muscle protein turnover and amino acid transport after resistance exercise in humans. Am J Physiol. 1995 Mar;268(3 Pt 1):E514-20.
33 Biolo G, Tipton KD, Klein S, Wolfe RR. An abundant supply of amino acids enhances the metabolic effect of exercise on muscle protein. Am J Physiol. 1997 Jul;273(1 Pt 1):E122-9.
34 Børsheim E, Tipton KD, Wolf SE, Wolfe RR. Essential amino acids and muscle protein recovery from resistance exercise. Am J Physiol Endocrinol Metab. 2002 Oct;283(4):E648-57.

35 Miller SL, Tipton KD, Chinkes DL, Wolf SE, Wolfe RR. Independent and combined effects of amino acids and glucose after resistance exercise. Med Sci Sports Exerc. 2003 Mar;35(3):449-55.
36 Rasmussen BB, Tipton KD, Miller SL, Wolf SE, Wolfe RR. An oral essential amino acid-carbohydrate supplement enhances muscle protein anabolism after resistance exercise. J Appl Physiol. 2000 Feb;88(2):386-92.
37 Rieu I, Balage M, Sornet C, Giraudet C, Pujos E, Grizard J, Mosoni L, Dardevet D. Leucine supplementation improves muscle protein synthesis in elderly men independently of hyperaminoacidaemia. J Physiol. 2006 Aug 15;575(Pt 1):305-15. Epub 2006 Jun 15.
38 Jitomir J, Willoughby DS. Leucine for retention of lean mass on a hypocaloric diet. J Med Food. 2008 Dec;11(4):606-9. Review.
39 Hulmi JJ, Tannerstedt J, Selänne H, Kainulainen H, Kovanen V, Mero AA. Resistance exercise with whey protein ingestion affects mTOR signaling pathway and myostatin in men. J Appl Physiol. 2009 May;106(5):1720-9. Epub 2009 Mar 19.
40 Moore DR, Tang JE, Burd NA, Rerecich T, Tarnopolsky MA, Phillips SM. Differential stimulation of myofibrillar and sarcoplasmic protein synthesis with protein ingestion at rest and after resistance exercise. J Physiol. 2009 Feb 15;587(Pt 4):897-904. Epub 2009 Jan 5.
41 Lands LC, Grey VL, Smountas AA. Effect of supplementation with a cysteine donor on muscular performance. J Appl Physiol. 1999 Oct;87(4):1381-5.
42 Bounous G, Gold P. The biological activity of undenatured dietary whey proteins: role of glutathione. Clin Invest Med. 1991 Aug;14(4):296-309.
43 Walzem RL, Dillard CJ, German JB. Whey components: millennia of evolution create functionalities for mammalian nutrition: what we know and what we may be overlooking. Crit Rev Food Sci Nutr. 2002 Jul;42(4):353-75. Review.
44 Crinnion WJ. Environmental medicine, part 2 - health effects of and protection from ubiquitous airborne solvent exposure. Altern Med Rev. 2000 Apr;5(2):133-43. Review.
45 Crinnion WJ. Environmental medicine, part 4: pesticides - biologically persistent and ubiquitous toxins.

Altern Med Rev. 2000 Oct;5(5):432-47. Review.
46 Bounous G, Gervais F, Amer V, Batist G, Gold P. The influence of dietary whey protein on tissue glutathione and the diseases of aging. Clin Invest Med. 1989 Dec;12(6):343-9.
47 Bounous G. Whey protein concentrate (WPC) and glutathione modulation in cancer treatment. Anticancer Res. 2000 Nov- Dec;20(6C):4785-92. Review.
48 Marshall K. Therapeutic applications of whey protein. Altern Med Rev. 2004 Jun;9(2):136-56. Review.
49 Oben J, Kothari SC, Anderson ML. An open label study to determine the effects of an oral proteolytic enzyme system on whey protein concentrate metabolism in healthy males. J Int Soc Sports Nutr. 2008 Jul 24;5:10.
50 Berdanier CD. Advanced Nutrition Micronutrients. Boca Raton: CRC Press;1998. pp. 101-104.
51 Feskanich D, Willett WC, Stampfer MJ, Colditz GA. Protein consumption and bone fractures in women. Am J Epidemiol. 1996 Mar 1;143(5):472-9.
52 Munger RG, Cerhan JR, Chiu BC. Prospective study of dietary protein intake and risk of hip fracture in postmenopausal women. Am J Clin Nutr. 1999 Jan; 69(1):147-52.
53 Wengreen HJ, Munger RG, West NA, Cutler DR, Corcoran CD, Zhang J, Sassano NE. Dietary protein intake and risk of osteoporotic hip fracture in elderly residents of Utah. J Bone Miner Res. 2004 Apr; 19(4):537-45. Epub 2004 Feb 9.
54 Institute of Medicine. Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids. Washington, DC: National Academies Press, 2005.
55 Martin WF, Armstrong LE, Rodriguez NR. Dietary protein intake and renal function. Nutr Metab (Lond). 2005 Sep 20; 2:25.
56 McKenzie S, Phillips SM, Carter SL, Lowther S, Gibala MJ, Tarnopolsky MA. Endurance exercise training attenuates leucine oxidation and BCOAD activation during exercise in humans. Am J Physiol Endocrinol Metab. 2000 Apr; 278(4):E580-7.
57 Miller BF, Olesen JL, Hansen M, Døssing S, Crameri RM, Welling RJ, Langberg H, Flyvbjerg A, Kjaer M, Babraj JA, Smith K, Rennie MJ. Coordinated collagen and muscle protein synthesis in human patella tendon and quadriceps muscle after exercise. J Physiol. 2005 Sep 15; 567(Pt 3):1021-33. Epub 2005 Jul 7.

This information is educational material for dotFIT certified fitness professionals. This literature is not to be used to imply that dotFIT products may diagnose, treat, cure or prevent any disease.

Quick Reference Guide

Introduction

About dotFIT Worldwide

- Science-based research and support
  - See dotFIT Worldwide Faculty & Advisory Board below
- Education and certification from The National Academy of Sports Medicine (NASM)
  - The market leader in Fitness, Sports Medicine and Sports Performance credentials
  - NASM activates over 25,000 credentials annually with over 100,000 professionals worldwide
  - Works with over 6,000 health clubs and all professional sports organizations
- Evidence-based tools and applications
  - R&D and support for nutrition/weight control and exercise programming for all ages and goals
  - Web-based, client- and trainer-centric programming: exercise, menu plans with supplement screening, continuous feedback to client and/or trainer based on measurement inputs and goal
- Worldwide professional delivery network
  - Live fitness professionals as well as phone and e-coaching platforms
- Programs can connect to body sensing/tracking devices
  - Calorie expenditure, steps, physical activity, etc.
- Unlimited education: For consumers and professionals via website, live webinars, certifications, and direct access to R&D team via our toll-free phone number (877.436.8348)
- Complete, holistically integrated line of pharmaceutically manufactured dietary supplements and fitness foods including home delivery platform

dotFIT Worldwide Faculty and Advisory Board

INSTITUTIONAL RELATIONSHIPS AND ADVISORY RESOURCES University of North Carolina Arizona School of Health Sciences University of Hawaii	CHIROPRACTIC HEALTH AND WELLNESS Eric Plasker, DC
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NUTRITION AND EXERCISE INSTRUCTORS Scott Pullen MS, CES, PES National Academy of Sports Medicine staff	

dotFIT Worldwide's Position on Use, Recommendations & Manufacture of Dietary Supplements

The function of dietary supplement preparations is to provide a safe vehicle for delivering precise amounts of desired isolated nutrients and compounds in a low- to no-calorie form with the purpose of enhancing health, sport and fitness goals, i.e. dietary support.

Individual outcomes from the use of dietary supplements, as with drugs, are predicated on the physiological and psychological state of the recipient as well as dosages, regiment compliance, manufacturing processes including the use of proper delivery systems, and ingredient forms or origins.

dotFIT's position on overall dietary supplement use and recommendations

Dietary supplement products must be 100% defensible through scientific research, not used to treat medical conditions and only recommended in support of the following goals:

- Preserving health
  - Objective: potentially stave off chronic or age-related disease by improving the daily nutrient intake achieved through diet alone
- Safely enhance sport and fitness outcomes
  - Objective: hasten and support fitness/weight control goals
  - Objective: improve training-induced performance results

Position on use of supplements for health

Multivitamin and mineral formula (MVM): all persons of all ages should use a daily MVM to complement one's best efforts to define and consume a proper diet.[1,2]

At a minimum, MVM supplementation is insurance against common and unavoidable shortcomings driven by typical daily diets and local food supply or availability.[3,4] At best, the daily increased level of all known vital nutrients supplied by the MVM may indeed allow optimal cellular performance. Levels of nutrition delivered by diet combined with a MVM (significantly higher but well within a safe range) has more potential than diet alone (especially within a range of acceptable calories) to supply all cellular entities/enzymes with enough materials to operate at full capacity thus avoiding a potential triage effect that may be at the root of many chronic and age-related diseases.[4,5,6,7,8] (See Appendix 1: dotFIT Worldwide's Position on Vitamin & Mineral Supplementation.)

Calcium & Vitamin D: supplement if daily needs of calcium (1000-1200mgs/day) and vitamin D (400-1000 IUs/day) are not met by food, sunlight and multivitamin mineral formula.[5,9,10] There is almost no reason to supplement calcium alone.

Position on use of supplements in support of weight control

Dieting to lose weight is difficult for everyone and generally ends with most of the weight regained within the first year.[11,12,13]

The goal of incorporating a dietary supplement or drug into a weight loss program is to assist the participant in complying with the daily routine that leads to weight reduction. The supplement ingredients must have safely demonstrated the potential to act in one or more of the following ways:

- Help create and maintain a calorie deficit by increasing daily calorie expenditure when compared to a non-supplemented state
- Raise energy levels that may make one more active throughout the day
- Reduce the drive to consume food
- Decrease calorie absorption

The dieter would cease supplementation once the weight goal is reached or when they have their daily routines under control to continue making progress without supplements.

Position on use of supplements for enhancing performance

Maximizing potential during high-level competition involves athletes exploiting all available resources – some good and some bad. In the 2008 Olympics, 90% of the 11,000 athletes reported regularly using dietary supplements. There was not a single supplement contamination case, giving a "thumbs up" to the

dietary supplement industry for making safe, unadulterated substances.[14]

There is unequivocal evidence that a limited number of natural substances prepared and ingested properly can safely improve training-induced size or performance for many athletes.[15,16,17,18,19,20,21] Historically, however, athletes have had a tendency to not follow directions. Many subscribe to the old adage, "if a little works, more is better." The practice of overconsumption of anything—such as foods, dietary compounds, and drugs—can lead to problems. On the other hand, proper supplementation for performance has often been shown to generate truly remarkable benefits, and this in itself can save many athletes from turning to illegal anabolic steroid use, which has well-known, harmful side effects. The rationale behind using nutritional strategies to avoid training plateaus centers around findings that the extent of muscle damage induced by exercise appears to remain constant throughout a prolonged training regimen. Meaning, repeated exercise sessions continue to "open the door" for the building process even if no muscle or strength gains are being produced.[22]

Therefore, when the benefits of training and diet on muscle mass and performance have stabilized, specific nutrient supplement regimens may play a role in plateau avoidance and progressive development for many athletes.

Position on final individual recommendations

All dotFIT programs prepared by dotFIT Worldwide are designed to screen individuals based on physical characteristics and goals in order to safely and properly integrate dietary supplements into their fitness programs to accomplish the above stated outcomes.

Position on manufacturing and facts regarding dotFIT products

Before nutritional compounds become products or are recommended for consumer use, all ingredients must survive rigorous legal and scientific review and testing. The following conditions are met:

- Identify best, current clinical research supporting use of active ingredients (evidence-based)
- Identify data supporting safety and efficacy including long-term empirical data (see Table 1 below and Evaluation Guidelines)
- Identify proper ingredient dosage and forms matched to positive outcomes from clinical data
- As science progresses, all products must be updated immediately

Products are designed in appropriate delivery forms established by each product's ingredients, desired target tissues, and the amounts required in specific time periods to deliver on the product claims. In other words, validate that the right ingredients and amounts get to the right places at the right times.

- Customized finished products are tested in a simulated human digestive system to validate whether release patterns match their respective designed criteria in order to assure the desired results
- Dietary supplement products and powders are manufactured in a FDA-registered pharmaceutical facility, in compliance with Good Manufacturing Practices (GMP)
- Ingredient testing for purity, potency and delivery from raw materials to finished product
- Final product rigorous testing, both in-house and through third-party, FDA-approved and NSF certified laboratories, assures users that all nutritional claims meet or surpass FDA guidelines, USDA guidelines, and industry norms
- All formulas must be able to work in synergy with other dotFIT products in order to avoid nutrient overages, which are common with typical, indiscriminate supplement use

dotFIT programs consider diet, medications, and other dotFIT products before a personalized dietary supplement recommendation is generated. This assures the user remains in a safe and optimal nutrient range throughout the day.

dotFIT foods cannot be "spiked" with unnecessary nutrients. Most other products in this space (e.g. bars, shakes, ready-to-drinks, etc.) are heavily spiked with many nutrients that can lead to undesirable levels within the body when combining multiple manufacturers, products and normal food intake. When consuming only dotFIT products, as directed with one's normal daily food intake, the recipient can be

assured of keeping the body at a safe and optimal nutrient level.

dotFIT must provide complete customer product/program education and support, including full disclosure regarding product ingredients, safety and manufacturing.

Product Testing Documentation

- Tests that include disintegration, dissolution, stability, purity (no contaminants) and potency, which includes the finished product's certificate of analysis
- In-house and 3rd party product validation and testing methods based on all available certified protocols including applicable USPs (United States Pharmacopeia, an official compendia of standards) and other international compendia – also see dotFIT Product Manufacturing and Testing document in Appendix
- Appropriate peer-review research that supports the dosage and purpose of the compound
- Proof of equivalence or evidence that a given dose of a product must contain a certain amount of key ingredients in order to produce a known effect
- Proof that products will be absorbed and utilized by the body
- Assurance that the substance is nontoxic, along with list of any known potential side effects and drug interactions
- Qualified personnel and support documents available to all consumers via www.dotFIT.com or 877.436.8348

Product Evaluation Guidelines and Scoring

Only products/ingredients that score a four or five out of five possible points are potential dotFIT Worldwide-authorized products and may become integrated into holistic fitness planning (e.g. combined with diet and movement planning). See Table 1.

Review of Products

A. Criteria for evaluation: to establish product integrity
   i. History of safe use
   ii. Cultural or traditional medicine
   iii. Anecdotal or empirical reports
B. Product formulation
C. Individual ingredients

Research documenting claims, performed on humans

D. Published in peer reviewed literature – citation(s)
   i. Product formulation
   ii. Individual ingredients
E. Books/brochures and company marketing brochures or sales sheets
   i. Product formulation
   ii. Individual ingredients
F. Privately sponsored, unpublished reports or studies
   i. Product formulation
   ii. Individual ingredients
G. Research supporting either a biochemical or physiological rationale

Research documenting claims, performed on animals

H. All same as above

Safety Studies

I. Animal toxicology studies
J. In vitro toxicology studies
K. Human clinical evaluations
   i. Dosage and route of administration
   ii. Toxicity

L. Human anecdotal/empirical reports
   i. Dosage and route of administration
   ii. Toxicity

Adverse Event Reports
M. Center for Disease Control (CDC)
N. Food and Drug Administration (FDA)
O. World Health Organization (WHO)
P. State Health Departments
Q. Trial Lawyers Association: personal injury litigation groups

Food and Drug Administration
The regulatory agency for approved claims with medical – scientific evidence for documentation of educational marketing claims in advertising and 'third party' literature under DSHEA*.
R. Structure (anatomy) claims
S. Function (physiology) claims
T. Life Event' claims
U. Fitness claims
V. Anabolic/weight gain claims
W. Androgenic/strength and endurance claims
X. Fat loss (lipolysis) claims
Y. Metabolic rate (BMR) and lean body mass claims
Z. Cardiovascular tone/'aerobic' fitness claims
AA. Recovery time/'muscle burn' claims

* DSHEA is the Dietary Supplement Health Education Act of 1994. The DSHEA established a formal definition of "dietary supplement" using several criteria. A dietary supplement
- is a product (other than tobacco) that is intended to supplement the diet that bears or contains one or more of the following dietary ingredients: a vitamin, a mineral, an herb or other botanical, an amino acid, a dietary substance for use by man to supplement the diet by increasing the total daily intake, or a concentrate, metabolite, constituent, extract, or combinations of these ingredients
- is intended for ingestion in pill, capsule, tablet, or liquid form
- is not represented for use as a conventional food or as the sole item of a meal or diet
- is labeled as a "dietary supplement"
- includes products such as an approved new drug, certified antibiotic, or licensed biologic that was marketed as a dietary supplement or food before approval, certification, or license (unless the Secretary of Health and Human Services waives this provision)

Table 1—Product Evaluation Score: Rating of Evidence
Only products that score a four or five rating are potential dotFIT authorized products.

SCORE	RATING	DOCUMENTATION/ EVIDENCE CRITERIA
5	Excellent (>90% Probability)	Product formulation claims documented by human studies
4	Very Good (>70%<90% Probability) (High Probability)	At least two (2) of the product's formulated ingredients claims documented by human studies
3	Good (<70%>30% Probability) (Medium Probability)	One of the product's formulated ingredients claims documented by human studies
2	Fair (>10%<30% Probability) (Low Probability)	No human studies. However, at least two (2) of the product's formulated ingredients have a biochemical- physiologic rationale
1	Poor <10% Probability) (Questionable Probability)	No human studies. However, at least one (1) of the product's formulated ingredients have a biochemical– physiologic rationale
0	Fails (Zero Probability – "Hype")	No documented human studies, and no biochemical – physiologic rationale for any ingredients

The Products

Included in the complete Supplement Reference Guide online are the following for each dotFIT product:

- Goal
- Rationale
- Typical Use
- Dosage
- Definitions
- Precautions
- Contraindications
- Adverse Reactions
- Upper Limits/Toxicity

Definitions

Goal

Describes the purpose of the formulation, including each product's intended outcome.

Rationale

Lists the ingredient's basic mechanisms of action and their respective function in participating in the product's intended outcome or goal.

Typical Use

Describes the known group of users that may experience the product's potential listed benefits.

Dosage

Lists the dosages used in studies and historically with the greatest potential for safety and efficacy.

Precautions

The compounds in this Supplement Reference Guide (SRG) are considered safe for the general population at the proper dosage. Under this heading and the subheadings below, a summary of safety considerations will be called out for potential vulnerable subpopulations.

Contraindications

Describes conditions in which the compound might be avoided or signal caution, including people with unique genetic predispositions, certain pre-existing disease states or persons taking specific prescription medications.

Adverse Reactions

Lists possible side effects and/or explains commonly reported reactions that may not be clinically supported or causally related to the compound. Case reports may be used to explain theoretical risk when clinical trials or specific studies are not available. Case reports are not considered scientifically valid for proving efficacy or documenting risks, but may be used to highlight an unlikely but potential safety issue.

Upper Limit/Toxicity

Gives the highest known dose that still maintains a large margin of safety and any known toxicity data. When available the Recommended Daily Allowance (RDA), **No Observed Adverse Effect Level (NOAEL)**, **Lowest Observed Adverse Effect Level (LOAEL)** and the lethal dose 50 (LD50) values will be given. The LD is the dose at which 50% of the test animals (rats or mice) died and is usually only used as a reference for the relative toxicity of a substance.

The **Tolerable Upper Intake Level or Upper Limit (UL)** is the maximum level of total chronic (long-term) daily intake judged unlikely to pose a risk of adverse health effects to most of the healthy population, including sensitive individuals, throughout their life stages. The UL is intended to provide a safety standard for dietary supplements such that no significant or unreasonable risk of illness or injury would arise at or below this intake level.

References

1 Fairfield KM, Fletcher RH. Vitamins for chronic disease prevention in adults: scientific review .JAMA. 2002 Jun 19;287(23):3116-26. Review.
2 [No authors listed] Multivitamins: should you buy this insurance? Studies have raised doubts about vitamins, but the multivitamin pill is still a good idea. Harv Health Lett. 2006 Sep;31(11):3-5.
3 Krebs-Smith SM, Guenther PM, Subar AF, Kirkpatrick SI, Dodd KW. Americans do not meet federal dietary recommendations. J Nutr. 2010 Oct;140(10):1832-8. Epub 2010 Aug 11.
4 Calton JB. Prevalence of micronutrient deficiency in popular diet plans. J Int Soc Sports Nutr. 2010 Jun 10;7:24.
5 Autier P, Gandini S. Vitamin D supplementation and total mortality: a meta-analysis of randomized controlled trials. Arch Intern Med. 2007 Sep 10;167(16):1730-7. Review.
6 Garland CF, Garland FC, Gorham ED, Lipkin M, Newmark H, Mohr SB, Holick MF. The role of vitamin D in cancer prevention. Am J Public Health. 2006 Feb;96(2):252-61. Epub 2005 Dec 27. Review.
7 Xu Q, Parks CG, DeRoo LA, Cawthon RM, Sandler DP, Chen H. Multivitamin use and telomere length in women. Am J Clin Nutr. 2009 Jun;89(6):1857-63. Epub 2009 Mar 11.
8 Ames BN. Low micronutrient intake may accelerate the degenerative diseases of aging through allocation of scarce micronutrients by triage. Proc Natl Acad Sci U S A. 2006 Nov 21;103(47):17589-94. Epub 2006 Nov 13. Review.

9 Institute of Medicine. Dietary Reference Intakes: Vitamins. Washington DC: National Academy Press; 2008. 6p.
10 Hollis BW. Circulating 25-hydroxyvitamin D levels indicative of vitamin D sufficiency: implications for establishing a new effective dietary intake recommendation for vitamin D. J Nutr. 2005 Feb;135(2):317-22. Review.
11 Lien LF, Haqq AM, Arlotto M, Slentz CA, Muehlbauer MJ, McMahon RL, Rochon J, Gallup D, Bain JR, Ilkayeva O, Wenner BR, Stevens RD, Millington DS, Muoio DM, Butler MD, Newgard CB, Svetkey LP. The STEDMAN project: biophysical, biochemical and metabolic effects of a behavioral weight loss intervention during weight loss, maintenance, and regain. OMICS. 2009 Feb;13(1):21-35.
12 McGuire MT, Wing RR, Klem ML, Lang W, Hill JO. What predicts weight regain in a group of successful weight losers? J Consult Clin Psychol 1999;67:177–85.
13 Phelan S, Hill JO, Lang W, Dibello JR, Wing RR. Recovery from relapse among successful weight maintainers. Am J Clin Nutr. 2003 Dec;78(6):1079-84.
14 Starling, Shane. "Dietary supplements win Olympic gold." 2008. NutraingredientsUSA. 15 Sep. 2008 < http://www.nutraingredients-usa.com/Industry/Dietary-supplements-win-Olympic-gold >.
15 Doherty M, Smith PM. Effects of caffeine ingestion on rating of perceived exertion during and after exercise: a meta-analysis. Scand J Med Sci Sports. 2005 Apr;15(2):69-78. Review.
16 Buford TW, Kreider RB, Stout JR, Greenwood M, Campbell B, Spano M, Ziegenfuss T, Lopez H, Landis J, Antonio J. International Society of Sports Nutrition position stand: creatine supplementation and exercise. J Int Soc Sports Nutr. 2007 Aug 30;4:6.
17 Chrusch MJ, Chilibeck PD, Chad KE, Davison KS, Burke DG. Creatine supplementation combined with resistance training in older men. Med Sci Sports Exerc. 2001 Dec;33(12):2111-7.
18 Astorino TA, Roberson DW. Efficacy of acute caffeine ingestion for short-term high-intensity exercise performance: a systematic review. J Strength Cond Res. 2010 Jan;24(1):257-65. Review.
19 Goldstein ER, Ziegenfuss T, Kalman D, Kreider R, Campbell B, Wilborn C, Taylor L, Willoughby D, Stout J, Graves BS, Wildman R, Ivy JL, Spano M, Smith AE, Antonio J. International society of sports nutrition position stand: caffeine and performance. J Int Soc Sports Nutr. 2010 Jan 27;7(1):5.
20 Ganio MS, Klau JF, Casa DJ, Armstrong LE, Maresh CM. Effect of caffeine on sport-specific endurance performance: a systematic review. J Strength Cond Res. 2009 Jan;23(1):315-24. Review.
21 Kerksick C, Harvey T, Stout J, Campbell B, Wilborn C, Kreider R, Kalman D, Ziegenfuss T, Lopez H, Landis J, Ivy JL, Antonio J. International Society of Sports Nutrition position stand: nutrient timing. J Int Soc Sports Nutr. 2008 Oct 3;5:17. Erratum in: J Int Soc Sports Nutr. 2008;5:18.
22 Tipton KD, Cocke TL, Wolf SE, Wolfe RR. Response of muscle protein metabolism to resistance training and acute resistance exercise during hyperaminoacidemia. Am J Physiol, 2006; in press.

Dietary Supplements for Health

health dotFIT

The goal of dietary supplements in this category is to help establish and preserve health or potentially stave off chronic or age-related disease by delivering important nutrient compounds1 that may be unattainable from diet for any of the following reasons (also see Appendix 1: dotFIT Worldwide's Position on Vitamin & Mineral Supplementation):

- Insufficient food intake[2,3,4]
- Increased needs that are not met by diet alone[4,5,6,7,8,9,10,11,12,13,14]
- Special populations, age-related requirements or practicality of foods sources[13,14,15]
- Lack of interest in or avoidance of essential food groups[16,17,18,19,20,21,22,23]
- Low body fat maintenance[2,24,25,26]
- Variables of actual nutrient content of food[27,28,29,30]
- Unable to move enough to eat enough[31,32]
    - In the modern world, where many people maintain a sedentary lifestyle, maintaining a healthy weight often requires eating too few calories to get proper nutrition through food alone[31,32,33]
- Low sun exposure[14,34,35,36,37,38,39]
- Inability to define the perfect diet[40,41,42,43]

References

1 Murphy SP, White KK, Park SY, Sharma S. Multivitamin-multimineral supplements' effect on total nutrient intake. Am J Clin Nutr. 2007 Jan;85(1):280S-284S. Review.

2 Marra MV, Boyar AP. Position of the American Dietetic Association: nutrient supplementation. J Am Diet Assoc. 2009 Dec;109(12):2073-85.

3 Sebastian RS, Cleveland LE, Goldman JD, Moshfegh AJ. Older adults who use vitamin/mineral supplements differ from nonusers in nutrient intake adequacy and dietary attitudes. J Am Diet Assoc. 2007 Aug;107(8):1322-32.

4 Lee C, Majka DS. Is calcium and vitamin D supplementation overrated? J Am Diet Assoc. 2006 Jul;106(7):1032-4.

5 Blom HJ, Shaw GM, den Heijer M, Finnell RH. Neural tube defects and folate: case far from closed. Nat Rev Neurosci. 2006 Sep;7(9):724-31.

6 Shils ME, Vernon RY. Modern Nutrition in health and disease. 7th edition. Philadelphia PA: Lea and Febiger; 1988. 1694 p.

7 Winters LR, Yoon JS, Kalkwarf HJ, Davies JC, Berkowitz MG, Haas J, Roe DA. Riboflavin requirements and exercise adaptation in older women. Am J Clin Nutr 1992 Sep;56(3):526-32.

8 Campbell WW, Anderson RA. Effects of aerobic exercise and training on the trace minerals chromium, zinc and copper. Sports Med 1987 Jan-Feb;4(1):9-18.

9 Beals KA, Manore MM. Nutritional status of female athletes with subclinical eating disorders. J Am Diet Assoc 1998 Apr;98(4):419-25.

10 Manore MM. Chronic dieting in active women: what are the health consequences? Womens Health Issues 1996 Nov-Dec;6(6):332-41

11 Johnson MA. Nutrition and aging--practical advice for healthy eating. J Am Med Womens Assoc. 2004 Fall;59(4):262-9.

12 Calton JB. Prevalence of micronutrient deficiency in popular diet plans. J Int Soc Sports Nutr. 2010 Jun 10;7:24.

13 Harris WS, Appel LJ. New guidelines focus on fish, fish oil, omega-3 fatty acids. American Heart Association; http://www.americanheart.org/presenter.jhtml?identifier=3065754 2002(November 11)

14 Autier P, Gandini S. Vitamin D supplementation and total mortality: a meta-analysis of randomized controlled trials. Arch Intern Med. 2007 Sep 10;167(16):1730-7. Review.

15 Nutrition and Your Health: Dietary Guidelines for Americans, 2005. 6th ed. Washington, DC: US Government Printing Office; 2005.

16 Krebs-Smith SM, Guenther PM, Subar AF, Kirkpatrick SI, Dodd KW. Americans do not meet federal dietary recommendations. J Nutr. 2010 Oct;140(10):1832-8. Epub 2010 Aug 11.

17 Striegel-Moore RH, Thompson DR, Affenito SG, Franko DL, Barton BA, Schreiber GB, Daniels SR, Schmidt M, Crawford PB. Fruit and vegetable intake: Few adolescent girls meet national guidelines. Prev Med. 2006 Mar;42(3):223-8. Epub 2006 Jan 10.
18 Serdula MK, Gillespie C, Kettel-Khan L, Farris R, Seymour J, Denny C. Trends in fruit and vegetable consumption among adults in the United States: behavioral risk factor surveillance system, 1994-2000. Am J Public Health. 2004 Jun;94(6):1014-8.
19 Economic Research Service, US Department of Agriculture. America's Eating Habits.: Changes and Consequences 1999. USDA/Economic Research Service, Washington D.C.
20 Kant AK. Reported consumption of low-nutrient-density foods by American children and adolescents: nutritional and health correlates, NHANES III, 1988 to 1994. Arch Pediatr Adolesc Med. 2003 Aug;157(8):789-96.
21 Nicklas TA, Weaver C, Britten P, Stitzel KF. The 2005 Dietary Guidelines Advisory Committee: developing a key message. J Am Diet Assoc. 2005 Sep;105(9):1418-24. Erratum in: J Am Diet Assoc. 2005 Dec;105(12):1869.
22 Fulgoni V 3rd, Nicholls J, Reed A, Buckley R, Kafer K, Huth P, DiRienzo D, Miller GD. Dairy consumption and related nutrient intake in African-American adults and children in the United States: continuing survey of food intakes by individuals 1994-1996, 1998, and the National Health And Nutrition Examination Survey 1999-2000. J Am Diet Assoc. 2007 Feb;107(2):256-64.
23 Krebs-Smith SM, Guenther PM, Subar AF, Kirkpatrick SI, Dodd KW. Americans do not meet federal dietary recommendations. J Nutr. 2010 Oct;140(10):1832-8. Epub 2010 Aug 11.
24 Beals KA. Eating behaviors, nutritional status, and menstrual function in elite female adolescent volleyball players. J Am Diet Assoc. 2002 Sep;102(9):1293-6.
25 Jonnalagadda SS, Bernadot D, Nelson M. Energy and nutrient intakes of the United States National Women's Artistic Gymnastics Team. Int J Sport Nutr. 1998 Dec;8(4):331-44.
26 Caine D, Lewis R, O'Connor P, Howe W, Bass S. Does gymnastics training inhibit growth of females? Clin J Sport Med. 2001 Oct;11(4):260-70. Review.
27 Clark LC; Combs GF Jr; Turnbull BW; Slate EH; Chalker DK; Chow J; Davis LS; Glover RA; Graham GF; Gross EG; Krongrad A; Lesher JL Jr; Park HK; Sanders BB Jr; Smith CL; Taylor JR. Effects of selenium supplementation for cancer prevention in patients with carcinoma of the skin. A randomized controlled trial. Nutritional Prevention of Cancer Study Group. JAMA 1996 Dec 25;276(24):1957-63.
28 Combs GF. The vitamin's functional aspects in nutrition and health. 2nd Edition. San Diego: Academic Press; 1988.
29 Agte V, Tarwadi K, Mengale S, Hinge A, Chiplonkar S. Vitamin profile of cooked foods: how healthy is the practice of ready-to-eat foods? Int J Food Sci Nutr. 2002 May;53(3):197-208.
30 Viadel B, Barbera R, Farre R. Effect of cooking and legume species upon calcium, iron and zinc uptake by Caco-2 cells. J Trace Elem Med Biol. 2006;20(2):115-20.
31 Ogden CL, Flegal KM, Carroll MD, Johnson CL. Prevalence and trends in overweight among US children and adolescents, 1999-2000. JAMA. 2002 Oct 9;288(14):1728-32.
32 Pennington J, Kandiah J, Nicklas T, Pitman S, Stitzel K. Practice paper of the American dietetic association: nutrient density: meeting nutrient goals within calorie needs. J Am Diet Assoc. 2007 May;107(5):860-9.
33 King JC. An evidence-based approach for establishing dietary guidelines. J Nutr.2007;137:480-483.
34 Reichrath J. The challenge resulting from positive and negative effects of sunlight: how much solar UV exposure is appropriate to balance between risks of vitamin D deficiency and skin cancer? Prog Biophys Mol Biol. 2006 Sep;92(1):9-16. Epub 2006 Feb 28. Review.
35 Kimlin MG, Schallhorn KA. Estimations of the human 'vitamin D' UV exposure in the USA. Photochem Photobiol Sci. 2004 Nov-Dec;3(11-12):1067-70. Epub 2004 Nov 17.
36 Kimlin MG, Olds WJ, Moore MR. Location and vitamin D synthesis: is the hypothesis validated by geophysical data? J Photochem Photobiol B. 2007 Mar 1;86(3):234-9. Epub 2006 Dec 4.
37 Holick MF. Vitamin D and sunlight: strategies for cancer prevention and other health benefits. Clin J Am Soc Nephrol. 2008 Sep;3(5):1548-54. Epub 2008 Jun 11.
38 Vieth R. What is the optimal vitamin D status for health? Prog Biophys Mol Biol. 2006 Sep;92(1):26-32. Review.
39 Holick MF. Sunlight and vitamin D for bone health and prevention of autoimmune diseases, cancers, and cardiovascular disease. Am J Clin Nutr. 2004 Dec;80(6 Suppl):1678S-88S. Review.
40 Dollahite J, Franklin D, McNew R. Problems encountered in meeting the Recommended Dietary Al

lowances for menus designed according to the Dietary Guidelines for Americans. J Am Diet Assoc 1995 Mar;95(3):341-4, 347.
41 Institute of Medicine. Dietary Reference Intakes Table – The Complete Set. Washington DC: National Academy Press; 2005. 1-7p.
42 Barratt J. Diet-related knowledge, beliefs and actions of health professionals compared with the general population: an investigation in a community Trust. J Hum Nutr Diet. 2001 Feb;14(1):25-32.
43 Russell R M. New views on the RDAs for older adults. J Am Diet Assoc 1997 May;97(5):515-8.

ActiveMV™

What is it?
The ActiveMV formula is a multipurpose multivitamin and mineral formula. The ActiveMV is used at the specified times throughout one's lifetime. This formula contains doses of antioxidants at the higher end of the optimal range.

How does it work?
The ActiveMV delivers a combination of nutrients in a controlled-release preparation that, when used properly, has the greatest chance to

- Help stave off chronic disease
- Supply essential nutrients in an attempt to prevent nutrient deficiencies
- Overcome marginal deficiencies from today's common limitations in obtaining sufficient and optimal nutrient intake

Who should take this product?
At one pill daily, it is the basic multivitamin for everyone over 12 years of age. At two pills daily, it is designed for athletes and all others with an active lifestyle aged 18 to 65 (general population over age 50, see the Over50MV formula and women 18 to 50 years of age, see the Women'sMV formula).

Suggested Use
As a dietary supplement, athletes or individuals involved in intense physical activity should take 1 tablet, twice daily, with or after main meals. Consume with 8 oz of your favorite beverage.

Individuals between the ages of 12-17 years of age and those who do not follow a regular exercise program should use 1 tablet daily with a main meal. For optimal results use daily with dotFIT SuperCalcium+.

Unique Features
- Formula and use follow strict scientific research criteria
- Serves as the foundation of all other supplement recommendations
- Because all dotFIT products are formulated to work synergistically, when consuming other dotFIT products and products exclusively you never need to worry about excessive nutrient intake, which is common with other product lines
- The nutrients are in their proper forms, ratios and strengths to help maintain a safe and optimal range 24 hours a day

Contraindications
- The dotFIT multivitamin and mineral formulas are contraindicated in pregnancy and lactation
- The dotFIT multivitamin-and-mineral formulas are contraindicated for those with hemochromatosis (an inherited disease that leads to iron-overload, affecting 0.5 percent of the population) because of the iron content

Supplement Facts

Serving Size: 1 Tablet — Servings Per Container: 30

Amount Per Serving		% Daily Value*
Vitamin A (as Beta Carotene 4,000 IU and Acetate 500 IU)	4,500 IU	90%*
Vitamin C (as Ascorbic acid)	450 mg	750%*
Vitamin D (as Cholecalciferol)	600 IU	150%*
Vitamin E (as D-Alpha Tocopheryl Succinate)	150 IU	500%*
Vitamin K (as Phytonadione)	50 mcg	63%*
Vitamin B1 (as Thiamine Mononitrate)	5 mg	333%*
Vitamin B2 (as Riboflavin)	5 mg	294%*
Niacin (as Niacinamide)	15 mg	75%*
Vitamin B6 (as Pyridoxine HCl)	6 mg	300%*
Folic Acid	100 mcg	25%*
Vitamin B12 (as Cyanocobalamin)	15 mcg	250%*
Biotin	150 mcg	50%*
Iron (as Ferrous Fumarate)	5 mg	28%*
Iodine (from Kelp)	25 mcg	17%*
Magnesium (as Magnesium Oxide)	150 mg	38%*
Zinc (as Zinc Citrate)	7.5 mg	50%*
Selenium (as L-Selenomethionine)	50 mcg	71%*
Copper (as Copper Gluconate)	500 mcg	25%*
Chromium (as Chromium Picolinate)	50 mcg	42%*

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Di-Calcium Phosphate, Stearic acid (Vegetable source), Hydroxypropylmethylcellulose, Microcrystalline Cellulose, Magnesium Stearate (Vegetable source), Silicon Dioxide, Xanthan gum.

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.

Women'sMV™

What is it?
A health aid designed with the specific needs of females in mind by including slightly higher levels of magnesium, iron and folic acid. Also included are the appropriate extra nutrients for breastfeeding women who do not need the higher iron content in most prenatal formulas.

How does it work?
The Women'sMV delivers a combination of nutrients in a controlled release preparation that, when used properly, has the greatest chance to:

- Help stave off chronic disease
- Supply essential nutrients in an attempt to prevent nutrient deficiencies
- Overcome marginal deficiencies from today's common limitations in obtaining sufficient and optimal nutrient intake

Who should take this product?
The Women'sMV formula is specifically for

- Non-exercising women between ages 18 and 50 who are not pregnant or trying to become pregnant
- Breastfeeding women

Suggested Use

- As a dietary supplement, take 1 tablet daily with a meal and 8 oz. of water.
- For optimal results use daily with dotFIT SuperCalcium+.

Unique Features

- Formula and use follow strict scientific research criteria
- Serves as the foundation of all other dotFIT supplement recommendations
- Because all dotFIT products are formulated to work synergistically, when consuming other dotFIT products and supplements exclusively, you never need to worry about consuming excess nutrients, which is common with other product lines
- The nutrients are in their proper forms, ratios and strengths to help maintain a safe and optimal range 24 hours a day
- Uses the most sophisticated controlled-release delivery systems to ensure ideal nutrient levels and prevent tissue over-saturation and losses
- Manufactured in a FDA registered facility, in compliance with Good Manufacturing Practices (GMP) exclusively for dotFIT, LLC

Contraindications

- The dotFIT multivitamin and mineral formulas are contraindicated in pregnancy and lactation
- The dotFIT multivitamin-and-mineral formulas are contraindicated for those with hemochromatosis (an inherited disease that leads to iron-overload, affecting 0.5 percent of the population) because of the iron content

Supplement Facts

Serving Size: 1 Tablet
Servings Per Container: 60

	Amount Per Serving	% Daily Value
Vitamin A (as Beta Carotene 5,000 IU and Acetate 1,000 IU)	6,000 IU	120%*
Vitamin C (as Ascorbic acid)	300 mg	500%*
Vitamin D (as Cholecalciferol)	1,000 IU	250%*
Vitamin E (as D-Alpha Tocopheryl Succinate)	100 IU	333%*
Vitamin K (as Phytonadione)	50 mcg	63%*
Vitamin B1 (as Thiamine Mononitrate)	6 mg	400%*
Vitamin B2 (as Riboflavin)	6 mg	353%*
Niacinamide	20 mg	100%*
Vitamin B6 (as Pyridoxine HCl)	9 mg	450%*
Folic Acid	400 mcg	100%*
Vitamin B12 (as Cyanocobalamin)	12 mcg	200%*
Biotin	100 mcg	33%*
Pantothenic Acid (as D-Calcium Pantothenate)	15 mg	150%*
Iron (as Ferrous Fumarate)	10 mg	56%*
Iodine (from Kelp)	100 mcg	67%*
Magnesium (as Magnesium Oxide)	100 mg	25%*
Zinc (as Zinc Citrate)	12 mg	80%*
Selenium (as L-Selenomethionine)	50 mcg	71%*
Chromium (as Chromium Picolinate)	50 mcg	42%*

*Percent Daily Values are based on a 2,000 calorie diet.
** % Daily Value not established.

Other Ingredients: Dibasic Calcium Phosphate, Microcrystalline Cellulose, Croscarmellose Sodium, Stearic acid, Magnesium Stearate Silicon Dioxide,

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts or Soy.
No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.

Storage Conditions: Store in a cool, dry place.

Over50MV™

What is it?
A health aid designed with the older individual in mind. It contains optimal doses of folic acid, vitamin B6 and vitamin B12. Also included are bone-building nutrients such as vitamin D, vitamin A (beta carotene) and even vitamin K.

How does it work?
The Over50MV delivers a combination of nutrients in a controlled release preparation that, when used properly, has the greatest chance to:

- Help combat preventable diseases such as osteoporosis and heart disease
- Supply essential nutrients in an attempt to prevent nutrient deficiencies
- Overcome marginal deficiencies from today's common limitations in obtaining sufficient and optimal nutrient intake

Who should take this product?
The Over50 MV Multivitamin formula is for

- Non-athletes over 50 years of age
- Athletes and intense exercisers over 65 years of age

Suggested Use

- As a dietary supplement, take 1 tablet daily with a meal and 8 oz. of water.
- For optimal results use daily with dotFIT SuperCalcium+.

Unique Features

- Formula and use follow strict scientific research criteria
- Serves as the foundation of all other dotFIT supplement recommendations
- Because all dotFIT products are formulated to work synergistically, when consuming other dotFIT products and supplements exclusively, you never need to worry about nutrient overages, which is common with other product lines
- The nutrients are in their proper forms, ratios and strengths to help maintain a safe and optimal range 24 hours/day
- Uses the most sophisticated controlled-release delivery systems to ensure ideal nutrient levels and prevent tissue over-saturation and losses
- Manufactured in a FDA registered facility, in compliance with Good Manufacturing Practices (GMP) exclusively for dotFIT, LLC

Contraindications
The dotFIT multivitamin-and-mineral formulas are contraindicated for those with hemochromatosis (an inherited disease that leads to iron-overload, affecting 0.5 percent of the population) because of the iron content.

Supplement Facts

Serving Size: 1 Tablet — Servings Per Container: 60

Amount Per Serving		% Daily Value*
Vitamin A (as Beta Carotene 5,000 IU and Acetate 1,000 IU)	6,000 IU	120%*
Vitamin C (as Ascorbic acid)	400 mg	667%*
Vitamin D (as Cholecalciferol)	1,000 IU	250%*
Vitamin E (as D-Alpha Tocopheryl Succinate)	50 IU	167%*
Vitamin K (as Phytonadione)	50 mcg	63%*
Vitamin B1 (as Thiamine Mononitrate)	6 mg	400%*
Vitamin B2 (as Riboflavin)	6 mg	353%*
Niacin (as Niacinamide)	20 mg	100%*
Vitamin B6 (as Pyridoxine HCl)	10 mg	500%*
Folic Acid	400 mcg	100%*
Vitamin B12 (as Cyanocobalamin)	100 mcg	1,667%*
Biotin	100 mcg	33%*
Pantothenic Acid (as Calcium Pantothenate)	10 mg	100%*
Iron (as Ferrous Fumarate)	8 mg	44%*
Iodine (from Kelp)	75 mcg	50%*
Magnesium (as Magnesium Oxide)	100 mg	25%*
Zinc (as Zinc Citrate)	15 mg	100%*
Selenium (as L-Selenomethionine)	70 mcg	100%*
Copper (as Copper Gluconate)	1 mg	50%*
Chromium (as Chromium Picolinate)	100 mcg	83%*

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Microcrystalline Cellulose, Croscarmellose Sodium, Dibasic Calcium Phosphate, Stearic acid, Silicon Dioxide, Magnesium Stearate

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.

Storage Conditions: Store in a cool, dry place.

KidsMV™

What is it?
A health aid designed for a growing child who does not get sufficient amounts of important nutrients, such as vitamin D, due to myriad factors such as poor food choices, lack of interest in certain foods or food groups and picky eating behavior.

How does it work?
The KidsMV delivers a combination of nutrients in a controlled-release preparation that, when used properly, has the greatest chance to

- Supply essential nutrients in an attempt to prevent marginal nutrient deficiencies
- Develop and function optimally, especially academically
- Overcome marginal deficiencies from today's common limitations in obtaining sufficient and optimal nutrient intake

Who should take this product?
All children ages two to 11 unless a specific medical condition prohibits the proper intake of any nutrient contained in the formula.

Suggested Use
- Ages two to four take one daily
- Ages five to 11 take two daily
- Ages 12 to 17 use one adult ActiveMV™ tablet

Unique Features
- Formula and use follow strict and updated scientific research criteria for all youth ages
- Uniquely formulated to maintain a safe and optimal range of nutrients when combined with other dotFIT products
- The nutrients are in their proper forms, ratios and strengths to complement food intake and help maintain a safe and optimal range for 24 hours a day
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Contraindications
The dotFIT multivitamin and mineral formulas are contraindicated for those with hemochromatosis (an inherited disease that leads to iron-overload, affecting 0.5 percent of the population) because of the iron content.

Supplement Facts

Serving Size: 1 Tablet — Servings Per Container: 60

	Amount Per Serving	%Daily Value Children <4	%Daily Value Children & Adults >4
Vitamin A (as Beta-Carotene 2,000 IU and Retinyl Palmitate 500 IU)	2,500 IU	100%	50%
Vitamin C (as Ascorbic Acid)	50 mg	125%	83%
Vitamin D (as cholecalciferol)	250 IU	63%	63%
Vitamin E (as D-Alpha-Tocopheryl Succinate)	20 IU	200%	67%
Vitamin K (as Phytonadione)	30 mcg	*	38%
Thiamin (as Thiamin Mononitrate)	1 mg	143%	67%
Riboflavin	1 mg	125%	59%
Niacin (as Niacinamide)	6 mg	67%	30%
Vitamin B6 (as Pyridoxine HCl)	1 mg	143%	50%
Folate (as Folic Acid)	100 mcg	50%	25%
Vitamin B12 (as Cyanocobalamin)	3 mcg	100%	50%
Biotin	10 mcg	7%	3%
Pantothenic acid (as D-Calcium Pantothenate)	2 mg	40%	20%
Iron (as Ferrous Fumarate)	5 mg	50%	28%
Iodine (as Potassium Iodide)	50 mcg	71%	33%
Magnesium (as Magnesium Oxide)	20 mg	10%	5%
Zinc (as Zinc Oxide)	5 mg	63%	30%
Selenium (as Selenomethionine)	20 mcg	*	29%

* % Daily Value based on a 2,000 calorie diet.
** Daily Value not established.

SuperCalcium+™

What is it?
A health aid designed to supply the body with specific amounts of calcium carbonate for maximal absorption. Vitamin D and magnesium are included to further enhance absorption and utilization.

How does it work?
Taking adequate amounts of calcium and vitamin D supplies the nutrients that help prevent or slow the progression of osteoporosis (bone weakening), hip fractures, certain cancers and falls among the elderly.

Who should take this product?
SuperCalcium+ is suitable for

- Anyone not meeting the recommended amounts of calcium by not consuming two to three daily servings of dairy products or fortified products
- Individuals not getting optimal amounts of vitamin D through food, supplements or regular sun exposure

Suggested Use
As a dietary supplement take 1 tablet one to two times daily with a meal and 8 oz. of water.

Unique Features

- Contains calcium, magnesium and vitamin D, which are necessary for proper calcium absorption and utilization
- Calcium and magnesium are prepared in proper forms designed to optimize delivery and utilization
- Considers the use of other dotFIT products so you can maintain a safe and optimal range of total nutrient intake
- SuperCalcium+ is one component in the dotFIT longevity program
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Contraindications
The use of calcium supplements by those with a history of kidney stones has varied results. Some individuals with a history of stones will benefit from the supplementation of calcium with food as it aids in the removal of oxalates. Consult with a physician when a history of kidney stones exists, or when taking these drugs: biphosphonates, hydrogen blockers, levothyroxine, proton pump inhibitors, quinolones and tetracyclines.

Supplement Facts

Serving Size: 2 Tablets — Servings Per Container: 60

Amount Per Serving		% Daily Value*
Vitamin D (as Cholecalciferol)	400 IU	100%*
Calcium (as Carbonate)	1,000 mg	100%*
Magnesium (as Oxide)	500 mg	125%*

Other Ingredients: Hydroxypropyl Methylcellulose, Microcrystalline Cellulose, Stearic Acid (Vegetable Source), Magnesium Stearate (Vegetable Source)

Contains No: Dairy, Fish, Crustacean Shellfish, Tree Nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial coloring, Flavoring or Preservatives added.

SuperiorAntioxidant™

What is it?
A health aid designed to provide nutrients that have been shown to help protect against excess free radicals and may help

- Stave off the cellular damage they cause
- Decrease the risk of chronic disease
- Improve the maintenance of eye health
- Protect against heart disease
- Prevent cognitive decline

How does it work?
Excess free radical damage is caused by the normal aging process and environmental stresses. SuperiorAntioxidant provides a unique blend of compounds known to quench damaging free radicals in many important parts of the body including the eyes, brain, heart and muscles.

Who should take this product?
SuperiorAntioxidant is suitable for

- Everyone, exercisers and non-exercisers, interested in reducing free radical damage
- Those who want to achieve optimal health and functioning
- People interested in reducing the risk of chronic and age-related disease
- Intense exercisers who are looking to reduce the increased free radical production and damage associated with demanding training bouts
- Those who are interested in the dotFIT longevity program

Suggested Use
One tablet per day before or after a main meal with a favorite beverage.

Unique Features

- Contains only the most effective antioxidants in their proper amounts
- Accurately complements the dotFIT multivitamin formulas
- Ingredients are prepared in their proper forms to maximize delivery
- Uses the OptiBerry® berry blend which is clinically proven to have superior antioxidant activity
- This formula considers use of other dotFIT products so you can maintain a safe and optimal range of total nutrient intake
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Contraindications
dotFIT SuperiorAntioxidant formula is contraindicated in pregnancy and lactation.

Supplement Facts
Serving Size: 1 Softgel

Amount Per Serving	% Daily Value *
Alpha Lipoic Acid 200 mg	**
Co-Enzyme Q10 (CoQ-10) 100 mg	**
OptiBerry (from wild blueberry, strawberry, cranberry, wild bilberry, elderberry, raspberry) 30 mg	**
Lycopene 10 mg	**
Lutein 6 mg	**
Zeaxanthin 4 mg	**
D. Salina natural mixed carotenoids 1.5 mg	**

Other Ingredients: Soybean oil, Gelatin, Glycerin, Bee's Wax, Lecithin, Caramel color, Titanium Dioxide, Silicon Dioxide

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, or Gluten, No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.

Joint Flex Plus™

What is it?
A health aid that supplies joint compounds in the forms and amounts used in published research to support healthy joint tissue and function.

How does it work?
Cartilage is slowly lost in joints with injury and age (most noticeable between 50 and 60 years of age). Because cartilage acts as a cushion between bone joints, its loss causes friction, pain and stiffness. JointFlexibilityPlus provides the latest researched compounds found in and around the cells of cartilage that help

- Provide lubrication
- Retain water around the joint
- Delay structural degeneration of joint tissue

Who should take this product?
Joint Flex Plus is suitable for

- Individuals who want relief of mild joint discomfort with far fewer of the side effects that occur from chronic non-steroidal anti-inflammatory drug (NSAID) use such as aspirin or ibuprofren
- Those interested in a longevity program

Suggested Use
As a dietary supplement, take 2 tablets daily with meals, one in the morning, and one in the evening.

Unique Features

- Contains no other added ingredients so you may take other products (multivitamin, antioxidant) without worrying about reaching excessive levels that may be detrimental over time
- Dosages and compounds are in the precise amounts used in research that have shown to improve mobility, joint comfort, and knee-joint strength
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Contraindications

- The use of any chondroitin sulfate formula is contraindicated during pregnancy and lactation because of a lack of data for this population

Supplement Facts

Serving Size: 2 Capsules — Servings Per Container: 30

Amount Per Serving	% Daily Value*
BioCell Collagen II®	1,000 mg *
Hydrolyzed Collagen Type II	600 mg **
Chondroitin Sulfate	200 mg **
Hyaluronic Acid (HA)	100 mg **

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Kosher Gelatin (capsule), Rice powder, and Magnesium stearate.

Contains No: Shellfish (crustacean), Fish, Dairy, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial colors, Flavoring, Sulphites, MSG (monosodium glutamate) or Preservatives added. Free of Titanium dioxide.

SuperOmega-3

What is it?
A health aid designed maintaining cardiac and brain health. It provides two key essential fatty acids EPA and DHA that have demonstrated myriad health benefits related to heart and brain function.

How does it work?
The SuperOmega-3 delivers 60% EPA and 40% DHA—double the potency of typical fish oil products—which, when used properly, has the greatest chance to

- Reduce negative CV incidences
- Protect against age-related macular degeneration (AMD)
- Reduce the risk of dementia thus preserving cognitive function in the aging population
- Deliver the same benefits as the oil in fish

Who should take this product?
Omega-3 FA supplementation would be for all adults (over 18) who do not receive 1-2 grams per day of the omega-3 fatty acids EPA & DHA (equivalent to 2-4 servings of fatty fish/weekly) as a potential natural preventative aid in age-related cognitive decline and prevention of CV disease.

Suggested Use
For maintaining cardiac and brain health, take 1 or 2 softgels with any meal.

Unique Features
- Each softgel is uniquely enteric-coated to withstand stomach acid and dissolve in the small intestine. The result is maximum absorption and no "Fishy Repeat" or "Fish Burps"
- SuperOmega-3 fish oil complex is mercury-free & contains no PCBs
- This formula considers use of other dotFIT products so you can maintain a safe and optimal range of total nutrient intake
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Contraindications
- Anyone taking greater than 3g per day should do so only under the care of their physician due to risk of excessive bleeding at higher doses
- Should not be used if on anticoagulants or have uncontrolled hypertension
- May raise blood sugar and LDL in people with diabetes

Supplement Facts
Serving Size: 1 Softgel
Servings Per Container: 30
Calories 13
Fat Cal. 12

Amount Per Serving		% Daily Value*
Total Fat	**1.3 g**	**2%**
Saturated Fat	0.1 g	<1%
Trans Fat	0 g	**
Polyunsaturated Fat	1.1 g	**
Monounsaturated Fat	0.2 g	**
Cholesterol	**1 mg**	**<1%**
Vitamin E (D-Alpha Tocopheryl)	2 IU	7%
Total Omega-3 Polyunsaturates	600 mg	**
EPA (Eicosapentaenoic acid)	360 mg	**
DHA (Docosahexaenoic acid)	240 mg	**

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Gelatin, Glycerin, Water (Purified), Methacrylic acid, Copolymer, Triacetin FCC.

Contains No: Dairy, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten.
No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.
Components in this product are derived from natural sources.

Purity tested for pesticides, herbicides, PCBs and dioxins as well as heavy metals such as mercury.

This fish oil was processed using molecular distillation to ensure purity.

Advanced Brain Health™

What is it?
A health aid designed support brain function and to slow (and possibly stop or reverse) age-related decline in mental function.

How does it work?
Advanced Brain Health contains only well-researched brain support substances in their appropriate amounts, which, when used properly, has the greatest chance to

- Support brain function
- Slow age-related decline in mental functions
- Support the maintenance of brain tissue

Who should take this product?
Adults age 45 and older interested in supporting brain and nerve function during aging.

Suggested Use
- One to 3 tablets per day with food
- Typical dosage based on age
  - 45-55 years – 1/day
  - 56-65 years – 2/day
  - Over 65 years – 3/day

Unique Features
- Accurately complements the dotFIT™ multivitamin, antioxidant, and omega-3 formulas
- This formula considers use of other dotFIT products so you can maintain a safe and optimal range of total nutrient intake
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Contraindications
- The Advanced Brain Health formula is contraindicated in pregnancy and lactation and for anyone suffering adverse reactions to any of the ingredients.
- Pregnant or lactating females should use only a prenatal supplement.

Supplement Facts

Serving Size: 2 Capsules — Servings Per Container: 60

Amount Per Serving		% Daily Value *
Vitamin B12 (as Cyanocobalamin)	100 mcg	1,667%*
Acetyl-L Carnitine	500 mg	**
Phosphatidylserine	100 mg	**
Alpha Lipoic Acid	100 mg	**

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Gelatin, Magnesium Stearate, Microcrystalline Cellulose, Titanium Dioxide.

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Yeast, Artificial flavors, or Preservatives added.

Fitness & Performance Enhancing Dietary Supplements

weight loss dotFIT

The goal of supplements in this category is to assist the user in complying with the daily routine that leads to weight reduction by acting in one or more of the following ways:

- Help create and maintain a calorie deficit by increasing daily calorie expenditure when compared to a non-supplemented state
- Raise energy levels that may make one more active throughout the day
- Reduce the drive to consume food
- Decrease calorie absorption

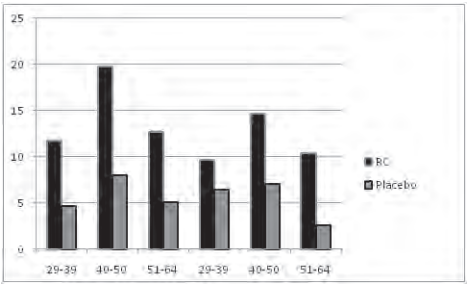
The dieter would cease supplementation once the weight goal is reached or when they have their daily routines under control to continue making progress without supplements.

See Appendix 2 in the complete SRG: Three proven strategies for weight reduction, maintenance of weight loss and prevention of weight gain.

FatRelease®

What is it?
A fat loss aid designed to
- Decrease the body's absorption of fat
- Support appetite
- Deliver the many potential benefits of green tea, including antioxidant properties
- Support the liver, one of your body's most active organs

How does it work?
As you gain weight the liver can accumulate excess fat, which can have a negative effect on the liver's health and ability to burn fat. The combination of ingredients in this product has been shown to support proper liver functioning, decrease the absorption of fat and calories and increase weight loss results. This formula is entirely new and only available through dotFIT.



As demonstrated in the graph above, during three months of dieting, the Rhododendron group lost two- to three-hundred percent more weight than the placebo subjects.

Who should take this product?
FatRelease is suitable for
- Anyone who wants to lose weight , especially females with a body fat greater than 32 percent and males with a body fat greater than 22 percent
- People who have difficulty limiting fat intake
- Individuals using the 90-day cycling program

Suggested Use
Take one tablet three times daily, 30 minutes before meals and with at least 8 oz. of water.

Unique Features
- The product supports weight loss at many different levels within the body (appetite, metabolism, fat absorption, etc.)
- Non-stimulant body fat and weight loss aid
- Blend is proprietary to dotFIT
- Can be used alone or in the 90-day cycling program to keep the body from adjusting to a single fat loss method
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Contraindications
FatRelease is contraindicated in pregnancy and lactation because of a lack of data for this population.

Supplement Facts

Serving Size: 1 Tablet — Servings Per Container: 90

Amount Per Serving	% Daily Value*
Green Tea Extract (Leaf) [Standardized for 98% Polyphenols (196mg), 75% Catechins (150mg), 45% EGCG (90 mg), 7% Caffeine (naturally occurring - 14 mg)]	200 mg **
Choline (as Choline Bitartrate)	133 mg **
N-Acetyl Cysteine (NAC)	50 mg **
Milk Thistle Seed Extract (80% Silymarin)	166 mg **
dotFIT® Proprietary Herbal Complex (Rhododendron caucasicum and Engelhardtia chrysolepis)	133 mg **

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

** % Daily Value not established.

Other Ingredients: Calcium Phosphate, Microcrystalline Cellulose, Croscarmellose, Stearic acid (Vegetable source), Silicon Dioxide, and Magnesium Stearate (Vegetable source).

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial Coloring, Flavoring or Preservatives added.

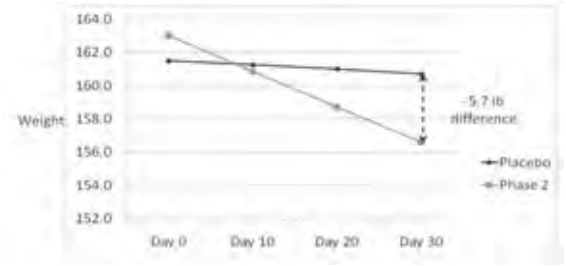
WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. Do not use if safety seal under cap is broken or missing. Store in a cool dry place. **KEEP OUT OF REACH OF CHILDREN.**

†These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

CarbRepel®

What is it?
A fat loss aid designed to
- Block carbohydrates or sugars from being absorbed and stored as body fat
- Keep food in the stomach longer which prolongs the feeling of fullness
- Manage appetite and control food intake
- Boost weight loss results

How does it work?
CarbRepel contains the best researched carb blocker which decreases the amount of carbs that will be absorbed by the body. The unique blend of fiber helps control appetite by helping you feel full sooner and for longer periods of time. All ingredients are supported by scientific studies including two approved Food and Drug Administration (FDA) claims.



In the figure above, subjects consumed a 2000-2200 calorie carbohydrate rich diet. The Phase 2 group experienced ~700% greater weight loss compared to the placebo.

Who should take it?
CarbRepel is suitable for
- Anyone who wants to lose weight and needs help with appetite control
- People who tend to overeat carbohydrates
- Individuals using the 90-day cycling program

Suggested Use
As a dietary supplement, take 2 tablets twice daily approximately 30 minutes before your largest carbohydrate containing meal with 8 oz. of water.

Unique Features
- Contains the first all natural nutritional ingredient that has been scientifically proven to block the digestion and absorption of starch from carbohydrates
- Non-stimulant body fat and weight loss aid
- Formula is proprietary to dotFIT
- Can be used alone or as part of the 90-day cycling program to keep the body from adjusting to a single fat loss method
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Contraindications
The compounds in CarbRepel are contraindicated in pregnancy and lactation because of a lack of data for these populations.

Supplement Facts

Serving Size: 2 Tablets — Servings Per Container: 60

Amount Per Serving	% Daily Value*
Phase 2 Starch Neutralizer®‡ White Kidney Bean Extract (Phaseolus vulgaris)	750mg **
Citrus Pectin	375 mg **
Pomegranate Fruit Extract (Total Polyphenols 110 mg, Ellagic Acid 55 mg)	137.5 mg **

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Calcium Phosphate, Microcrystalline Cellulose, Hydroxypropylmethylcellulose, Stearic acid (Vegetable source), Magnesium Stearate (Vegetable source), and Silicon Dioxide.

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial Coloring, Flavoring or Preservatives added. Components in this product are derived from natural sources.

‡The trademark Phase 2 Starch Neutralizer® is being used under license.

WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. Do not use if safety seal under cap is broken or missing. Store in a cool dry place. **KEEP OUT OF REACH OF CHILDREN.**

†These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

ThermAccel®

What is it?

A fat loss aid designed to

- Increase total daily calorie burn by raising thermogenesis (boosting metabolism by wasting calories and fat as heat)
- Improve your desire to move by enhancing alertness and stimulating the central nervous system
- Suppress appetite
- Increase fat burning

How does it work?

ThermAccel helps to

- Increase thermogenesis (wasting calories as heat) by combining a new energy complex with caffeine and caffeine-containing herbs
- Address appetite control by incorporating two powerful natural ingredients, Caralluma fimbriata and Lepticore™, that work through unique body fat regulation pathways
- Studies show at least a 10% increase in 24 hour EE or equivalent to 157 more calories burned in the caffeine/EGCG group (average subject's weight 173lbs)

Who should take this product?

ThermAccel is suitable for

- Anyone who wants to lose weight or body fat and can tolerate stimulants such as caffeine
- People who need help controlling appetite and food intake
- Fitness models, bodybuilders and those who are close to their final desired body composition goal
- Individuals using the 90-day cycling program

Suggested Use

As a dietary supplement, take 2 tablets with 8 oz. of water up to 2 times daily, approximately 30 minutes before breakfast and lunch. Do not consume within 5 hours of bedtime.

Unique Features

- Contains a unique thermogenic blend
- A stimulant used for aggressive body fat/weight reduction programs
- dotFIT Dual Stage Release Technology delivers active ingredients according to varying levels in the digestive tract
- Can be used alone or as part of the 90-day cycling program to keep the body from adjusting to a single fat loss method
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Contraindications

- ThermAccel is contraindicated for pregnant and lactating women and those under the age of 18
- Caffeine is contraindicated in hypertension, anxiety and thyroid disease. Caffeine can interfere with some medications such as lithium and MAO inhibitors. Caffeine is also contraindicated in those with cardiac arrhythmias, other forms of heart disease and peptic ulcers

Supplement Facts

Serving Size: 2 Tablets — Servings Per Container: 60

Amount Per Serving	% Daily Value*
LumaThin™ Caralluma Powder	520 mg **
dotFIT® Proprietary Lepticore™ Complex‡ (Acacia Polysaccharides, Esterified Fatty Acids, Pomegranate Extract, Aphyanizomenon Flos-Aquae Extract and Beta-Carotene)	310 mg **
L-Theanine	100 mg **
ThermAccel™ Thermogenic Complex Green Tea Extract (providing 270 mg EGCG), Caffeine (providing 350 mg of caffeine), Yerba Mate Powder, Guarana Seed Powder and Cayenne Fruit (standarized for 150,000 Heat Units)	1,000 mg **

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

** % Daily Value not established.

Other Ingredients: Calcium Phosphate, Microcrystalline Cellulose, Hydroxypropylmethylcellulose, Xanthum gum, Stearic acid (Vegetable source), Silicon Dioxide, and Magnesium Stearate (Vegetable source).

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial Coloring, Flavoring or Preservatives added.

‡Lepticore™ is a trademark of Pipeline Nutraceuticals, Inc. Protected by US patents 6,899,892,5,569,679 and patents pending.

WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. This product contains caffeine and should not be taken by those wishing to eliminate caffeine from their diets. Do not exceed recommended daily intake. Improper use of this product will not improve results and is not advised. Do not use if safety seal under cap is broken or missing. Store in a cool dry place. **KEEP OUT OF REACH OF CHILDREN.**

†These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

LeanMR™

A Balanced Nutrition Shake

What is it?

The dotFIT LeanMR drink mix was designed to support weight loss by providing a convenient, highly satisfying and nutritious meal replacement in fewer calories – an essential component of weight control. The unique combination of fiber, low glycemic carbs and healthy fats can boost the feeling of fullness, accelerate results and support health..

How does it work?

Research shows that using meal replacements once or twice a day can enhance weight loss, and continuous use helps people keep the weight off. That's because meal replacements help control calories, provide accurate calorie counts and may prevent people from skipping meals and over-eating later in the day. The dotFIT LeanMR drink mix contains a unique blend of low glycemic carbs and soluble fibers which help:

- Curb appetite
- Boost and maintain energy levels throughout the day
- Control blood sugar levels
- Lower cholesterol and triglycerides
- Improve gut health and bowel regularity

Who should take it?

LeanMR is suitable for:

- Individuals whose goal is to lose and sustain weight loss
- Anyone seeking a healthy and convenient meal or snack

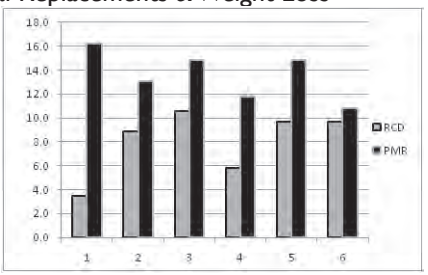
Suggested Use

- Add two (2) scoops of powder to at least one cup of water (8-12 fl. oz.) or liquid of your choice as a meal replacement (increase or decrease the amount of liquid to achieve desired consistency).
- Shake, stir or blend until dissolved. Add crushed ice and/or your favorite fruit (count your calories) for a thicker, tastier shake.

Unique Features

- Contains the highest quality whey protein
- Proprietary blend of carbohydrates, including functional fibers, deliver a "better lasting" energy source
- Contains NO ASPARTAME, LOW sugar and relatively LOW sodium
- Only 195 calories per serving with eight grams of fiber (31% of daily needs) for satiety and health
- Healthy blend of essential fats including CLA
- Not spiked with unnecessary ingredients
- Works in synergy with other dotFIT products so you can maintain a safe and optimal range of total nutrient intake
- Manufactured in a FDA registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Meal Replacements & Weight Loss



The figure above shows that in all six studies groups using meal replacements (PMR) as part of their overall calorie intake lost significantly more weight than subjects using reduced calorie diets (RCD) alone.

Reference: Heymsfield SB, van Mierlo CA, van der Knaap HC, Heo M, Frier HI. Weight management using a meal replacement strategy: meta and pooling analysis from six studies. Int J Obes Relat Metab Disord. 2003 May;27(5):537-49.

Nutrition Facts

Serving Size: 2 Scoops (51 g)
Servings Per Container: About 20
Calories 190
Fat Cal. 15

Amount Per Serving		% Daily Value*
Total Fat	**2 g**	**3%**
Saturated Fat	.5 g	3%
Trans Fat	0 g	**
Cholesterol	**10 mg**	**3%**
Sodium	**180 mg**	**8%**
Total Carbohydrate	**24 g**	**8%**
Dietary Fiber	7 g	28%
Sugars	0 g	**
Protein	**20 g**	**40%**
Vitamin A (as Beta Carotene)	500 IU	10%
Vitamin C (as Ascorbic acid)	6 mg	10%
Calcium (from Calcium Lactate Gluconate)	200 mg	20%
Iron (as Ferrous Sulfate)	1.8 mg	10%
Vitamin D (as Cholecalciferol)	40 IU	10%
Vitamin E (as Succinate)	3 IU	10%
Thiamine (as Thiamin Hydrochloride)	.15 mg	10%
Riboflavin	.17 mg	10%
Niacin (as Niacinamide)	2 mg	10%
Vitamin B6 (as Pyridoxine Hydrochloride)	.2 mg	10%
Vitamin B12 (as Cyanocobalamin)	.6 mcg	10%
Biotin	30 mcg	10%
Pantothenic acid (as D-Calcium Pantothenate)	1 mg	10%
Iodine (as Potassium Iodide)	15 mcg	10%
Magnesium (as Magnesium Phosphate)	40 mg	10%
Zinc (as Zinc Sulfate)	1.5 mg	10%
Copper (as Copper Gluconate)	.2 mcg	10%
Sustained Release Carbohydrates Blend Rice Oligodextrins, Digestion Resistant Maltodextrin (Fibersol-2), Isomaltulose, Glucomannan	21.5 g	**
Lean Fats Blend Flaxseed Powder, High Oleic Sunflower Oil, Conjugated Linoleic Acid	2.5 g	**

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Whey Protein Isolate, Lean Carb Blend (Rice Oligodextrins, Fibersol-2, Isomaltulose), Dutch Process Cocoa, Fat Blend (Flaxseed powder, High Oleic Sunflower oil, Conjugated Linoleic acid, Glucomannan, Vitamin and Mineral Blend (Calcium Lactate Gluconate, Magnesium Phosphate, Ascorbic acid, Vitamin E Succinate, Niacinamide, Ferrous Sulfate, Zinc Sulfate, Pantothenic acid, Beta Carotene, Pyridoxine HCl, Copper Gluconate, Riboflavin, Thiamin HCl, Biotin, Potassium Iodide, Cyanocobalamin, Vitamin D [Cholecalciferol]), Natural and Artificial Flavors, Carboxymethylcellulose gum, Salt, Sucralose, Acesulfame Potassium.

Contains: Derived from Milk.

	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Saturated Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Potassium	3,500mg	3,500mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g

Calories per gram: Fat 9 • Carbohydrate 4 • Protein 4

performance dotFIT™

The goal of products in this category is to deliver safe, known, performance-enhancing substances not practically available from food sources that can improve training-induced size or performance outcomes. For complete position statement see page 3, and nutrition dotFIT for other goal enhancing formulas. Also see Appendix 3 in the complete SRG: Xtreme Muscle Stack: Creating the Perfect Anabolic Storm.

This information is educational material for dotFIT certified fitness professionals. This literature is not to be used to imply that dotFIT products may diagnose, treat, cure or prevent any disease.

CreatineMonohydrate

What is it?

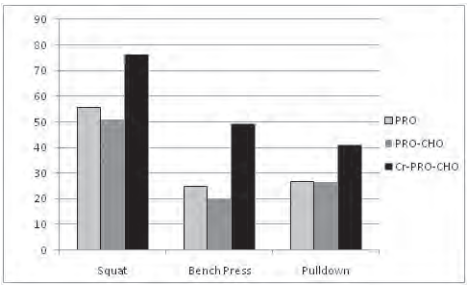
A performance aid designed to

- Improve anaerobic performance (sports and activities requiring quick bursts of energy)
- Increase strength and power
- Enhance muscle size and/or body composition

How does it work?

Creatine is a natural substance found in muscle that when supplemented accomplishes the above by

- Increasing the synthesis of the high energy compound phosphocreatine (PCr) and PCr levels in muscle allowing more strength and delayed fatigue leading to better, stronger workouts
- Increasing muscle cell swelling, which can also enhance muscle protein synthesis



The figure above clearly shows the creatine group out-performing the other groups.

Who should take it?

dotFIT CreatineMonohydrate is suitable for

- Experienced anaerobic athletes who want to enhance their performance and are not concerned with weight gain
- Experienced exercisers who consistently weight train and are looking to gain muscle
- Elderly persons seeking to enhance daily functions (confirmed by physician)

Suggested Use

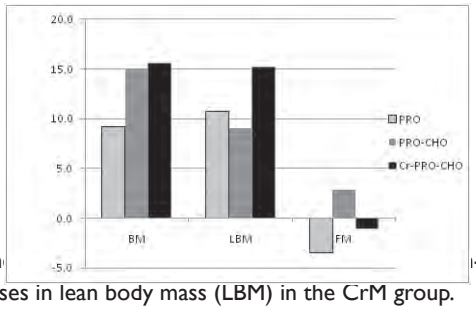
As a dietary supplement, Loading Phase: For the first 5 days take 4 capsules, 4 times daily with 8 oz. of cold water or your favorite beverage. Maintenance Phase: From day 5 onward consume 4 capsules, 1-2 times daily. On training days: Take 1 or 2 of the daily recommended 4 capsules shortly before and after exercise. For increased effects consume your creatine with 25-45g of a pre- or post-exercise carbohydrate food/beverage. For maximum results, use for a minimum of four weeks.

Unique Features

- Contains pure creatine monohydrate, the form shown in over 500 studies to yield desired results
- Convenient capsule delivery (no mess, consistent dose, no stomach upset)
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Contraindications

- Due to one study performed on rats and two human case reports, creatine supplementation is contraindicated for those with kidney problems or at risk for kidney disease because of possible increased kidney stress.
- Creatine supplementation should be avoided by pregnant or lactating women because of the lack of studies done with this population.
- Athletes not desiring weight gain should avoid creatine supplementation or attempt to lose body fat simultaneously in order to offset muscle weight increases thus still receiving creatine's potential performance benefits.



In th l-creases in lean body mass (LBM) in the CrM group.

DIRECTIONS: As a dietary supplement, **Loading Phase:** For the first 5 days take 6 capsules, 4 times daily with 8 oz. of cold water or your favorite beverage. **Maintenance Phase:** From day 5 onwards consume 6 capsules, 1-2 times daily. **On Training days:** Take 1 or 2 of the daily recommended 6 capsules shortly before and after exercise. For increased effects, consume your creatine with a pre or post exercise food/beverage that contains a minimum of 25 grams of carbohydrate. For maximum results use for a minimum of 4 weeks.

Supplement Facts

Serving Size: 3 Capsules — Servings Per Container: 90

Amount Per Serving	% Daily Value*
Creatine (as Creatine Monohydrate) 2,500 mg	**

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Gelatin, Magnesium Stearate, Microcrystalline Cellulose, Titanium Dioxide.

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial coloring, Flavoring or Preservatives added.

WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. Do not use if safety seal under cap is broken or missing. **KEEP OUT OF REACH OF CHILDREN.**

Storage Conditions: Store in a cool, dry place.

†These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

CreatineXXL™

What is it?
A performance aid designed to increase exercise intensity, training volume and lean muscle mass to a greater extent than creatine alone.

How does it work?
By adding beta-alanine to help delay fatigue (see figure below), CreatineXXL may increase the well-known strength- and size-enhancing effects of taking creatine supplements alone. In addition to creatine, this product supplies other compounds that optimize muscle cell volume which stimulates protein synthesis.

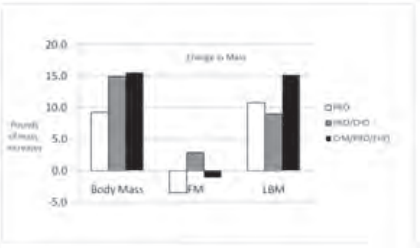
The figure above demonstrates CrM significantly increased muscle hypertrophy in all three muscle fiber types when compared to the other two groups without CrM.

Who should take this product?
- Intermediate and advanced exercisers and athletes seeking an advantage during high intensity, high-volume training regimes
- Anyone who is trying to overcome training and muscle size plateaus

Suggested Use
As a dietary supplement, on high intensity training days, take 8 capsules 30 minutes before workouts with 8 oz. of water or your favorite beverage. Then take the remaining 8 capsules throughout the remainder of the day. On non-training days, take 5 capsules, twice daily with morning and evening meals. For increased effect consume with 25-45g of a carbohydrate food/beverage. For maximum results, use for a minimum of four weeks.

Unique Features
- No other performance/weight gain product on the market contains this combination of ingredients in a convenient capsule form
- Can be used alone or with NO7Rage™ and AminoBoostXXL™ as part of the dotFIT "Xtreme Muscle Stack", providing maximum muscle pump and continuous training results for serious exercisers and athletes
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Contraindications
- Athletes who wish to prevent weight gain should avoid CreatineXXL.
- Women who are pregnant or lactating are contraindicated because of a lack of data for these populations.



The figure above shows significantly greater increases in lean body mass (LBM) in the CrM group.

Supplement Facts

Serving Size: 8 Capsules — Servings Per Container: 60

Amount Per Serving		% Daily Value*
Creatine (as Creatine Monohydrate)	3,000 mg	**
Beta-Alanine	1,600 mg	**
dotFIT™ Proprietary Cell Hydration Complex (L-Glutamine, L-Glycine)	2,100 mg	**

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Magnesium Stearate, Silicon Dioxide

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten. No Sugar, Salt, Starch, Artificial coloring, Flavoring or Preservatives added.

WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. Do not use if safety seal under cap is broken or missing. **KEEP OUT OF REACH OF CHILDREN.**

Storage Conditions: Store in a cool, dry place.

†These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

NO7Rage™

What is it?
A performance aid designed to enhance blood and nutrient flow to exercising muscles. This helps intensify training sessions, resulting in improved strength, performance and size when compared similar products or to training without using supplements. The ingredients in NO7Rage have been shown to

- Improve reaction time, endurance and power
- Improve mental focus and training motivation
- Enhance muscle gain
- Improve strength

How does it work?
NO7Rage contains a proprietary blend of compounds that work together to increase blood flow cell volume and mental focus. Greater blood flow to skeletal muscle increases the delivery of oxygen, energy and rebuilding nutrients, and also speeds up the removal of waste products. All of this leads to potential strength improvements, less muscle breakdown and increased muscle size. Results may be enhanced by properly consuming a specific ratio of the muscle building blocks contained in AminoBoostXXL.

Who should take this product?
- Intermediate and advance athletes and exercisers looking for an edge during high-intensity, high-volume training
- Anyone trying to overcome training and muscle size plateaus
- Anyone who needs or wants to stimulate training desire, workout intensity or mental focus

Suggested Use
Thirty to 40 minutes before workout
- Users under 150 lbs. take 1.5 scoops
- 150-200 lbs. take 2 scoops
- More than 200 lbs. take 2.5 scoops

Unique Features
- Contains L-citrulline which has been shown to be the most effective ingredient for inducing nitric oxide (NO) production
- Contains a unique, proprietary blend of taurine, glycerol and betaine to enhance the "muscle pump" during resistance training workouts
- Includes an exclusive blend of glycerol powder that may be the most important active ingredient related to desired results
- An essential component of the dotFIT "Xtreme Muscle Stack" for serious exercisers and athletes
- Contains beta-alanine which has been shown to increase exercise endurance, intensity and strength

Contraindications
- NO7Rage supplementation is contraindicated in pregnancy and lactation because of the CNS stimulant (caffeine). Caffeine can interfere with some medications such as lithium and MAO inhibitors.
- Caffeine is contraindicated in those with cardiac arrhythmias, other forms of heart disease, hyperthyroidism and peptic ulcers.
- Creatine is contraindicated for those with kidney problems because of potentially greater kidney stress.

Supplement Facts

Serving Size 1 scoop (22 grams)
Servings Per Container 40

	Amount Per Serving	% DV
Calories	**35**	
Total Carbohydrate	**9 g**	**3%**
Sugars	7 g	**
Vitamin C (as Ascorbic Acid)	250 mg	416%
Vitamin E (as D-Alpha-Tocopheryl Acetate)	30 IU	100%
Potassium (as Citrate and Carbonate)	300 mg	9%
Sodium (as Sodium Chloride)	120 mg	5%
Energy Complex	7,903 mg	**
Isomaltulose (Palatinose)		**
Phenylethylamine hydrochloride (Thin FenBeta PEA)		**
NO7Rage™ Proprietary Blend	3,913 mg	**
Glycerol Powder		**
L-Citrulline L-Malate (Citral M)		**
Beta Alanine (Carnosyn)		**
Pine Bark (85% Proanthocyanidins)		**
Alpha Lipoic Acid		**
Astaxanthin (AstaREAL®)		**
Creatine Monohydrate	2,500 mg	**
Taurine	2,000 mg	**
Glucuronolactone	400 mg	**
Caffeine Anhydrous	175 mg	**

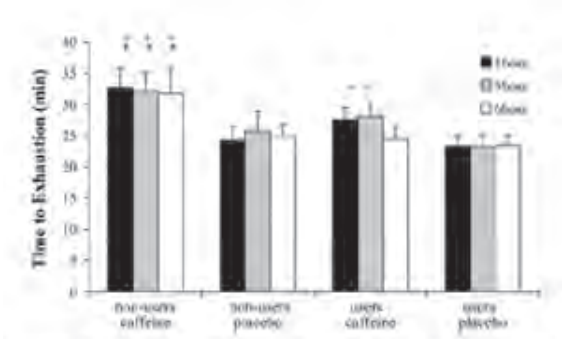
*Percent Daily Values are based on a 2,000 calorie diet.
** % Daily Value not established.

WorkoutExtreme™

What is it?
A performance aid designed to increase exercise focus, performance, and intensity without weight gain. This formula supplies several compounds that have shown to

- Increase energy levels
- Delay the onset of fatigue
- Improve training intensity
- Boost mental focus

How does it work?
WorkoutExtreme contains a unique blend (caffeine, ginseng, taurine, glucuronolactone) that has been shown to enhance mental focus and work capacity.



B. Caffeine and Endurance Performance

Figure above shows caffeine's effects based on time of administration before exercise.

Who should take this product?
dotFIT WorkoutExtreme is suitable for

- All athletes looking for an energy boost without water retention
- Endurance athletes who do not want to gain weight but are interested in improving performance
- Anyone not bothered by stimulants as an energy booster
- Those who are experiencing a training or weight loss plateau
- Not for use by those who experience adverse effects from stimulants

Suggested Use
As a dietary supplement, take 4 capsules 30 minutes before a workout with 8 oz. of water or your favorite beverage. Do not consume within 5 hours of bedtime. Cycle for 3 weeks on and 3 weeks off during intense training cycles.

Unique Features

- Increases workout energy and intensity without weight gain in a convenient pill form
- Ginseng is standardized and certified for proper ginsenosides that have shown positive metabolic effects
- Uses a rapid release capsule delivery system to maximize the formula's potential and provides an immediate impact on training intensity
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Contraindications

- WorkoutExtreme supplementation is contraindicated in pregnancy and lactation because of the CNS stimulants caffeine and ginseng
- Caffeine can interfere with some medications such as lithium and MAO inhibitors
- Caffeine is contraindicated in heart disease, hyperthyroidism and peptic ulcers
- American ginseng (Panax) is contraindicated for those taking cholinesterase and MAO inhibitors, anticoagulants, antiplatelet drugs and hypoglycemic medicines because of potential interactions

Supplement Facts

Serving Size: 4 Capsules — Servings Per Container: 30

Amount Per Serving	% Daily Value**
Taurine	1000 mg *
Glucuronolactone	600 mg *
Panax Ginseng (root) (8% Ginsenosides)	300 mg *
Caffeine Anhydrous	300 mg *

** Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
* % Daily Value not established.

Other Ingredients: Gelatin, Magnesium Stearate, Microcrystalline Cellulose, Titanium Dioxide.

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.

WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. This product contains caffeine and should not be taken by those wishing to eliminate caffeine from their diets. Do not exceed recommended daily intake. Improper use of this product will not improve results and is not advised. Do not use if safety seal under cap is broken or missing. **KEEP OUT OF REACH OF CHILDREN.**

Recover&Build™

What is it?
A performance aid designed to speed up the recovery process which allows you to maintain intense training bouts and ultimately improve performance.

How does it work?
Recover&Build provides the key building blocks of muscle - branched chain amino acids - in the most CURRENTLY studied ratio that can reduce muscle damage and enhance recovery by

- Supplying an additional fuel source to help meet energy demands
- Supporting muscle protein synthesis
- Minimizing muscle protein breakdown

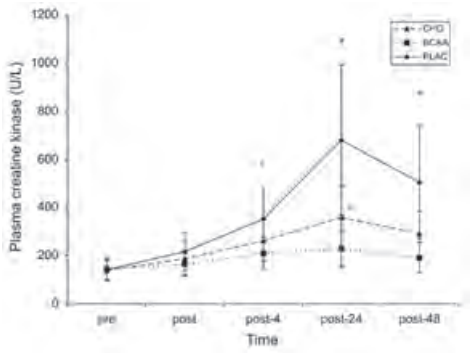
Who should take this product?
Recover&Build is suitable for

- Athletes and exercisers of any fitness level during intense or excessive training bouts
- Weight-conscious athletes or in-season bodybuilders
- Anyone beginning an intense exercise program
- In combination with other performance products to amplify their effects, especially to enhance recovery

Suggested Use
- Minimum dose: Take five tablets before exercise
- Optimal dose and for those over 200 lbs.: Take eight tablets before exercise

Unique Features
- Contains the CURRENT ideal ratio (high leucine levels) of branched chain amino acids - leucine, isoleucine and valine - in a convenient tablet form
- Uses a proprietary "swell and release" delivery system for rapid release and uptake by the working muscles
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Contraindications
- BCAA supplementation is contraindicated in pregnancy and lactation because of the lack of studies done with this population.
- BCAA supplementation is contraindicated for those with the hereditary disorder maple syrup urine disease or who have kidney disorders.



In the figure above, plasma creatine kinase (CK) is shown to be accurate indicator of muscle damage. Significantly lower serum CK activities were found in the BCAA trial at the 4-, 24-, and 48-h time points than in the PLAC trial ($P < 0.05$) Greer BK et al. Int J Sport Nutr Exerc Metab. 2007 Dec;17(6):595-607.

Supplement Facts

Serving Size: 5 Tablets — Servings Per Container: 20

Amount Per Serving	% Daily Value *
L-Leucine	3,835 mg **
L-Isoleucine	600 mg **
L-Valine	600 mg **

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Microcrystalline Cellulose, Dibasic Calcium Phosphate, Stearic Acid, Croscarmellose Sodium, Silicon Dioxide, Hydroxypropyl Cellulose, Magnesium Stearate

Contains No: Dairy, Fish, Crustacean shellfish, Tree nuts, Peanuts, Soy or Gluten No Sugar, Salt, Starch, Yeast, Artificial flavors, Coloring or Preservatives added.

WARNING: Not intended for individuals under the age of 18. Do not use this product if you are pregnant, nursing, or contemplating pregnancy. Consult your physician if you are taking any over-the-counter or prescription medications. Seek the advice of a health-care professional before beginning any supplement or exercise program. Do not use if safety seal under cap is broken or missing. **KEEP OUT OF REACH OF CHILDREN.**

Storage Conditions: Store in a cool, dry place.

AminoBoostXXL™

What is it?
A performance aid designed to deliver the ideal blend of nutrients to take advantage of "metabolic windows of opportunity" for optimal recovery and results. When taken properly, AminoBoostXXL

- Maximizes the body's muscle building mechanisms
- Can lead to greater strength and size gains, especially if you've hit a plateau

How does it work?
Following intense training, your body is in negative protein balance until amino acids are provided. Muscle protein synthesis is stimulated by taking this specific blend of amino acids before and after exercise.

Who should take this product?
AminoBoostXXL is suitable for

- All athletes who train hard and need rapid muscle tissue recovery. This includes all track and basketball athletes, most baseball players, wrestlers, boxers, runners, cyclists, etc.
- Physique competitors, especially while dieting to lose weight or body fat
- All older athletes and intense exercisers
- Anyone who is experiencing a plateau and trying to gain muscle

Suggested Use
As a dietary supplement, add 1 scoop (16g) to 8 oz. cold water and mix vigorously. Alternatively, mix with 20-40 grams of your favorite fast-acting carbohydrate beverage. For maximum results: On training days, use 1 serving 20 minutes pre-workout and 1 serving immediately post-workout. Individuals under 150 lbs. use half of the above recommended dosage.

Unique Features
- This formula uses a proprietary essential amino acid blend that significantly increased muscle protein synthesis
- Can result in significantly greater muscle gains than traditional protein and carbohydrate shakes and bars
- Contains fewer calories and less nitrogen load on the kidneys, thus providing the greatest "bang for your buck" of any post-workout supplement
- Can be used alone or with NO7Rage™ and CreatineXXL™ as part of the dotFIT "Xtreme Muscle Stack" providing maximum muscle pump and continuous training results for serious exercisers and athletes

Contraindications
- This product, as with any protein or creatine-containing supplement, is contraindicated for users with kidney or liver disease.
- This product is contraindicated for phenylketonurics because it contains phenylalanine.
- This product is also contraindicated for pregnant or lactating females because it has not been tested in these groups and because protein can be adequately supplied by the diet for fetal growth or lactation needs.

Supplement Facts
Serving Size: 15.5 grams (1 scoop)
Servings Per Container: About 34
Calories 0
Calories from Fat 0

Amount Per Serving		% Daily Value
Total Fat	**0 g**	**0%**
Saturated Fat	0 g	0%
Trans Fat	0 g	**
Cholesterol	**0 mg**	**0%**
Sodium (as Sodium Chloride)	**19 mg**	**<1%**
Total Carbohydrate	**0 g**	**0%**
Dietary Fiber	0 g	0%
Sugars	0 g	**
Protein	**0 g**	**0%**
AminoBoostXXL™ Proprietary Blend	12 g	**
L-Leucine		**
L-Phenylalanine		**
L-Lysine		**
L-Valine		**
L-Threonine		**
L-Isoleucine		**
L-Histidine		**
L-Methionine		**

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Citric acid, Natural and Artificial flavors, Sucralose, Acesulfame Potassium, Red 40. Soy Lecithin.

MuscleDefender™

What is it?
A performance aid designed to replenish glutamine which is depleted from long training sessions and over-training. Doing so allows you to maintain demanding training schedules and maximal performance.

How does it work?
Glutamine enhances recovery from prolonged, exhaustive exercise by

- Increasing muscle protein synthesis
- Refilling muscle fuel stores (glycogen synthesis)
- Supporting the immune system

Who should take it?
MuscleDefender is suitable for

- Highly stressed athletes who restrict calories, such as in-season bodybuilders and fitness competitors
- Endurance athletes with frequent and heavy training loads
- Exercisers who severely restrict calories for weight or fat loss
- Any athlete susceptible to over-training due to excessive workloads
- Use with other performance products to amplify their effects, especially to minimize over-training and enhance recovery

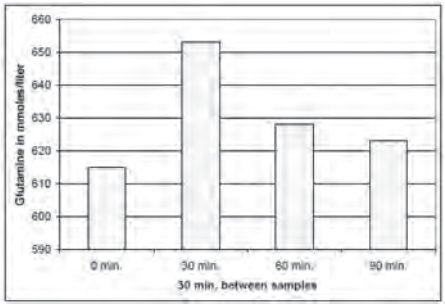
Suggested Use
As a dietary supplement, mix 1 scoop (8g) with 8 oz. of water or your favorite beverage. On training days, use 1 serving immediately after exercise. For maximum results use 1-2 servings daily

Unique Features

- Produced in an easy-to-mix powder
- Contains L-glutamine peptide and a patented, stable form of L-glutamine from Albion that has been demonstrated to elevate the body's glutamine levels. These levels remain elevated for 90 minutes after consumption

Contraindications

- Glutamine supplementation is contraindicated in those with kidney problems or at risk for kidney disease because of possible increased kidney stress.
- Glutamine supplementation should be avoided by pregnant or lactating women because of the lack of studies done with this population.
- Glutamine supplementation should not be employed by children and adolescents due to limited data.



Supplement Facts

Serving Size: 8 grams (One Level Scoop)
Servings Per Container: About 50

Amount Per Serving		% Daily Value
L-Glutamine	7.6 g	**
Magnesium (from 400 mg Magnesium Glycyl Glutamine‡)	34 mg	8.5%
Chromium (from 8 mg Chromium Nicotinate Glycinate Chelate‡)	200 mcg	167%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: None.

Pre/Post Workout Formula & Meal Replacement™

What is it?
A performance formula that can deliver enhanced exercise induced results and aid in weight control.

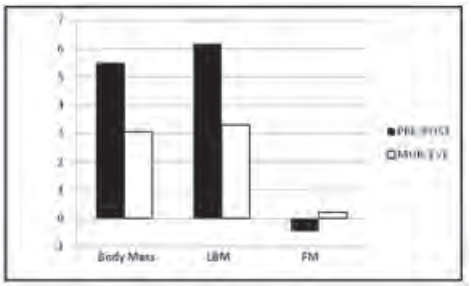
How does it work?
As a pre- and post-workout drink, the product delivers ideal amounts of carbohydrate, protein and fat in a form that can be rapidly digested in order to quickly reach muscle tissues to deliver energy, speed recovery and increase muscle building (see Fig 1).

Other uses for this product include
- Boosting energy and curbing hunger between meals
- Weight loss -- to control calories and provide accurate calorie counts
- Weight gain -- to increase daily calorie intake when unable to do so by consuming whole food

Who should use this product?
- All athletes and regular exercisers
- Anyone who needs a convenient and ideal pre- and post-exercise meal or snack
- Individuals who want to gain weight or muscle and need to increase their calorie intake
- People who want to enhance weight loss by replacing one to two meals per day with this formula. Research has shown doing so increases weight loss and makes it easier to sustain results long-term

Suggested Use
For pre-workout meals or snacks, add one or two scoops of powder to at least one cup (8 oz.) of cold water or liquid of your choice. To maximize recovery after workouts or competition, use one to two additional scoops.

Unique Features
- Low sugar, NO ASPARTAME
- Healthy blend of essential fats
- Perfect blend of the highest quality proteins
- Ideal blend of fast- and continuous-acting carbohydrates for quick and steady energy and recovery
- Works in synergy with other dotFIT™ products so you can maintain a safe and optimal range of total nutrient intake
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) and maintains rigorous product testing from raw materials to the finished products exclusively for dotFIT, LLC



In the figure above, training results from 23 experienced recreational bodybuilders resistance training for 10 weeks with all things (diet, supplements, training, etc.) equal except the addition of pre/post feedings yielded significantly greater gains in body mass, LBM, strength and reduction in fat mass for the pre/post feeding subjects.

Nutrition Facts
Serving Size: 2 Scoops (65 g)
Servings Per Container: About 176
Calories 250
Fat Cal. 30

Amount Per Serving		% Daily Value *
Total Fat	**3 g**	**5%**
Saturated Fat	1 g	5%
Trans Fat	0 g	**
Cholesterol	**30 mg**	**10%**
Sodium	**260 mg**	**11%**
Total Carbohydrate	**37 g**	**12%**
Dietary Fiber	3 g	12%
Sugars	2 g	**
Protein	**20 g**	**40%**
Vitamin A (as Beta Carotene)	500 IU	10%
Vitamin C (as Ascorbic acid)	6 mg	10%
Calcium (as Calcium Lactate Gluconate)	200 mg	20%
Iron (as Ferrous Sulfate)	1.8 mg	10%
Vitamin D (as Cholecalciferol)	40 IU	10%
Vitamin E (as Succinate)	3 IU	10%
Thiamin (as Thiamin Hydrochloride)	.15 mg	10%
Riboflavin	.17 mg	10%
Niacin (as Niacinamide)	2 mg	10%
Vitamin B6 (as Pyridoxine Hydrochloride)	.2 mg	10%
Vitamin B12 (as Cyanocobalamin)	.6 mcg	10%
Biotin	30 mcg	10%
Pantothenic acid (as D-Calcium Pantothenate)	1 mg	10%
Iodine (as Potassium Iodide)	15 mcg	10%
Magnesium (as Magnesium Oxide)	40 mg	10%
Zinc (as Zinc Sulfate)	1.5 mg	10%
Copper (as Copper Gluconate)	.2 mg	10%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** % Daily Value not established.

Other Ingredients: Maltodextrin, Protein Blend (Whey Protein Concentrate, Whey Protein Isolate, Micellar Casein, Calcium Caseinate), Dutch Processed Cocoa, Fat blend (High Oleic Sunflower oil, Medium Chain Triglyceride oil, Safflower oil), Natural and Artificial flavors, Carboxymethylcellulose gum, Vitamin and Mineral blend (Calcium Lactate Gluconate, Magnesium Phosphate, Ascorbic acid, Vitamin E Succinate, Niacinamide, Ferrous Sulfate, Zinc Sulfate, Pantothenic acid, Beta Carotene, Pyridoxine HCl, Copper Gluconate, Riboflavin, Thiamin HCl, Biotin, Potassium Iodide, Cyanocobalamin, Vitamin D [Cholecalciferol]), Salt, Sucralose, Acesulfame Potassium, Xanthan gum.

Contains: Milk

	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Saturated Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Potassium	3,500mg	3,500mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g
Calories per gram:	Fat 9 • Carbohydrate 4 • Protein 4	

WheySmooth™

What is it?
A performance formula that can deliver high quality protein and the essential amino acids our bodies need for optimal development, functioning and recovery with few calories.

How does it work?
Whey proteins have unique sequences of amino acids and small peptides that have demonstrated superior absorption and tissue-building effects than other proteins.

The combination of fast- and slow-acting proteins/amino acids in WheySmooth may help maximize the body's ability to build muscle.

Who should take it?
WheySmooth is suitable for

- Adults who do not meet protein requirements from food, especially fitness competitors, bodybuilders and other athletes (strength, endurance and active recreational) during an adaptation period
- Weight and body fat conscious athletes during the final weeks of competition dieting, in order to meet protein requirements with fewer calories
- Athletes who tend to over-train
- Anyone wanting a great tasting, convenient protein source
- Those concerned with proper timing of protein intake and want the quick digestibility that cannot be accomplished by traditional food sources.

Suggested Use
Add two scoops of powder to one cup (8-10 fl oz.) of cold water or liquid of your choice (increase or decrease the amount of liquid to achieve desired consistency). Shake, stir or blend until dissolved. Add your favorite carbohydrates as needed. Add crushed ice and/or your favorite fruit for a thicker, tastier shake.

Unique Features

- One serving contains 40 grams of protein from extremely high quality sources, giving WheySmooth its unique "fast and slow" release pattern
- Only two grams of sugar per serving and NO ASPARTAME
- Provides co-factors to ensure greater amino acid and protein utilization
- Great taste, easy mixing
- Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Supplement Facts
Serving Size: 2 Scoops (63 g)
Servings Per Container: About 18
Calories 250
Fat Cal. 35

Amount Per Serving		% Daily Value*
Total Fat	**4 g**	**6%**
Saturated Fat	1.5g	8%
Trans Fat	0 g	**
Cholesterol	**120 mg**	**40%**
Sodium	**200 mg**	**8%**
Total Carbohydrate	**13 g**	**4%**
Dietary Fiber	2 g	8%
Sugars	3 g	**
Protein	**40 g**	**80%**
Vitamin A	0 IU	0%
Vitamin C	0 mg	0%
Calcium (from Milk Protein)	215 mg	22%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
** Daily Value not established.

Other Ingredients: Protein Blend (Whey Protein Concentrate, Calcium Caseinate, Whey Protein Isolate, Egg White Protein, Micellar Casein), Cocoa Powder, Maltodextrin, High oleic Sunflower Oil, Carboxymethylcellulose gum, Natural and Artificial Flavors, Salt, Pyridoxine 5' Phosphate, Sucralose Acesulfame Potassium, Xanthan gum

Contains: Milk and Eggs

FirstString™

What is it?
A great-tasting performance formula that can enhance exercise-induced results, leading to maximum increases in strength and size.

How does it work?
As a pre- and post-workout drink, FirstString delivers ideal blends of carbohydrates, protein and fat in a form that can be rapidly digested in order to quickly reach muscle tissues to deliver energy, speed recovery and increase muscle building (see Fig 1).

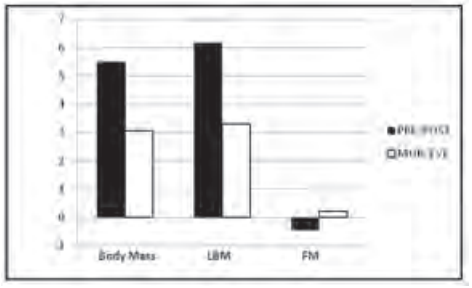
In addition, this formula meets the NCAA guidelines for college athletes.

Who should take it?
FirstString is suitable for
- All athletes, especially youth, collegiate, and professional, looking to gain strength or muscle
- Youth athletes to help maximize athletic development and overall growth potential

Suggested Use
- Over 200 lbs. add/mix four (4) scoops (one serving) of First String with 16-20 fl. oz. of cold water/fluid
- Under 200 lbs. add/mix two (2) scoops (half serving) of First String with 8-12 fl. oz. of cold water/fluid

Timing
- 1st serving: 30-40 minutes pre-workout
- 2nd serving: Post-workout or immediately following training
- 3rd serving: Snack or bedtime

Unique Features
- Contains Aminogen® for more complete digestion, absorption and retention
- NO Aspartame and low sugar
- Ideal carbohydrate mix to help maximize protein synthesis
- Sophisticated blend of the highest quality fast and slow acting proteins
- Not spiked with unnecessary nutrients Manufactured in a FDA-registered facility, in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC
- Meets NCAA and professional sport guidelines
  - NSF Certified for Sport



In the figure above, training results from 23 experienced recreational bodybuilders resistance training for 10 weeks with all things (diet, supplements, training, etc.) equal except the addition of pre/post feedings yielded significantly greater gains in body mass, LBM, strength and reduction in fat mass for the pre/post feeding subjects.

Nutrition Facts

Serving Size:	2 Scoops (75g)		4 Scoops (150g)	
Servings Per Container:	About 32		About 16	
	Calories 295	Fat Cal. 25	**Calories** 590	Fat Cal. 50
Amount Per Serving		**% Daily Value**	**Amount Per Serving**	**% Daily Value**
Total Fat	**3 g**	**4.5%**	**6 g**	**9%**
Saturated Fat	1 g	0%	2 g	0%
Trans Fat	0 g	**	0 g	**
Cholesterol	**60 mg**	**10%**	**120 mg**	**20%**
Sodium	**225 mg**	**9.5%**	**450 mg**	**19%**
Total Carbohydrate	**46 g**	**15.5%**	**92 g**	**31%**
Dietary Fiber	2,5 g	10%	5 g	20%
Sugars	2 g	**	4 g	**
Protein	**21 g**	**42%**	**42 g**	**84%**
Vitamin A (as Beta Carotene)	250 IU	5%	500 IU	10%
Vitamin C (as Ascorbic acid)	3 mg	5%	6 mg	10%
Vitamin D (as Cholecalciferol)	20 IU	5%	40 IU	10%
Vitamin E (as D-Alpha Tocopheryl succinate)	1.5 IU	5%	3 IU	10%
Thiamin (as thiamine hydrochloride)	0.075 mg	5%	0,15 mg	10%
Riboflavin	0,085 mg	5%	0,17 mg	10%
Niacin (as Niacinamide)	1 mg	5%	2 mg	10%
Vitamin B6 (as Pyridoxine HCl)	0.1 mg	5%	0,2 mg	10%
Vitamin B12 (as Cyanocobalamin)	0.3 mcg	5%	0,6 mcg	10%
Biotin	15 mcg	5%	30 mcg	10%
Pantothenic acid (as d-Calcium Pantothenate)	0,5 mg	5%	1 mg	10%
Calcium (from Milk Protein and Carbonate)	150 mg	15%	300 mg	30%
Iron (as Ferrous Sulfate)	2,25 mg	12,5%	4,5 mg	25%
Iodine (as Potassium Iodide)	7,5 mcg	5%	15 mcg	10%
Magnesium (as Magnesium Phosphate)	20 mg	5%	40 mg	10%
Zinc (as Zinc Sulfate)	0,75 mg	5%	1,5 mg	10%
Copper (as Copper Gluconate)	0,1 mg	5%	0,2 mg	10%
Aminogen® (13 Units)	125 mg	**	250 mg	**

	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Saturated Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Potassium	3,500mg	3,500mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

* % Daily Value not established.
**Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Other Ingredients: Maltodextrin, Protein Blend (Whey Protein Concentrate, Whey Protein Isolate, Micellar Casein, Calcium Caseinate, Aminogen®), Dutch Processed Cocoa, Fat blend (High Oleic Sunflower oil, Medium Chain Triglyceride oil, Safflower oil), Natural and Artificial flavors, Carboxymethylcellulose gum, Vitamin and Mineral blend (Calcium Lactate Gluconate, Magnesium Phosphate, Ascorbic acid, Vitamin E Succinate, Niacinamide, Ferrous Sulfate, Zinc Sulfate, Pantothenic acid, Beta Carotene, Pyridoxine HCl, Copper Gluconate, Riboflavin, Thiamin HCl, Biotin, Potassium Iodide, Cyanocobalamin, Vitamin D (Cholcalciferol), Salt, Sucralose, Acesulfame Potassium, Xanthan gum.

Allergen Statement: Contains Milk. Produced in a facility that also processes egg, and shellfish.

Contains: Derived from Milk and Soy.

Contains No: Fish, Crustacean Shellfish, Tree nuts, Peanuts, or Gluten. No Salt, Starch, Artificial coloring or Preservatives added.

nutrition dotFIT™ Sport and Fitness Foods

Overview

The purpose of the nutrition dotFIT line (including shake mixes) is to accomplish two important health, sport and fitness goals: 1) satisfy and compliment the evolving change in society's eating patterns by supplying great tasting meals and snacks – i.e. deliver better, satisfying nutrition with fewer calories; 2) these same foods/mixes, because of the unique formulations, will also be able to deliver the perfect ingredients to serve as the pre- and post-exercise/activity supplement that has been proven necessary to enhance training induced results.

The multiple uses/goals of the nutrition dotFIT assortment are the following:

- Weight control[1,2,3,4,5,6,7,8,9,10]
- Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake[11,12,13,14]
- Snack between meals as an energy boost or hunger killer[15]
- Pre- and post-exercise/activity energy and recovery supplement
- Guiltless dessert

Rationale (see individual product descriptions & references for more information)

Weight control

It has been well established that successful dieters, weight loss maintainers, athletes and others able to control a healthy weight regularly incorporate meal replacement/substitute type foods[1,2,8,9,10,13,14,16,17] (see Figures 1 & 2), including energy bars or snacks, meal replacements or "protein shakes", etc. into their daily meal plans for the following reasons:

- More for less: using nutrition dotFIT products allows you to increase the frequency of daily meals while managing calories in order to satisfy appetite and maintain greater daily energy levels – i.e. more nutrition[18] and fullness with fewer calories and often a significant savings in groceries. Proper use throughout the day can deliver sound nutrition while helping to save calories allowing you to partake in larger meals/favorite foods for desired times (e.g. higher calorie lunches and/or dinners)
- Proper use allows more accurate calorie counts of total daily food intake when compared to having to estimate the calories of self-prepared or unmarked meals[19]
- Products in the nutrition dotFIT category offer helpful portion control: people generally attempt to consume meals to completion; therefore meal portion size significantly impacts a person's total calorie intake. Overwhelming evidence validates that the smaller the portions, the fewer daily calories consumed[20,21,22] and vice-versa i.e. people tend to "eat with their eyes not their stomachs"[12,13,14,23]
- A healthy, lower calorie alternative to traditional fast foods
- Convenient storage anywhere and faster than stopping and picking up generally less healthy, higher calorie traditional fast foods

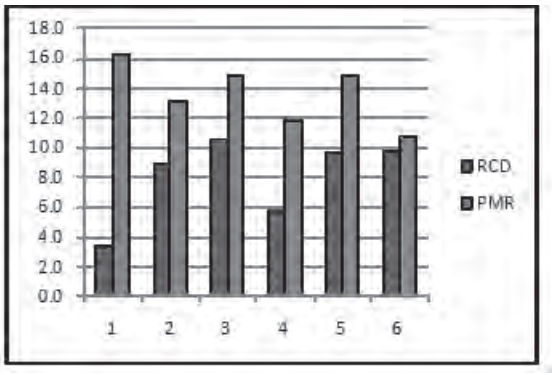


Figure 1: In all six studies the groups using meal replacements (PMR) as part of their overall calorie intake lost significantly more weight than the reduced calorie diet (RCD) group.[1]

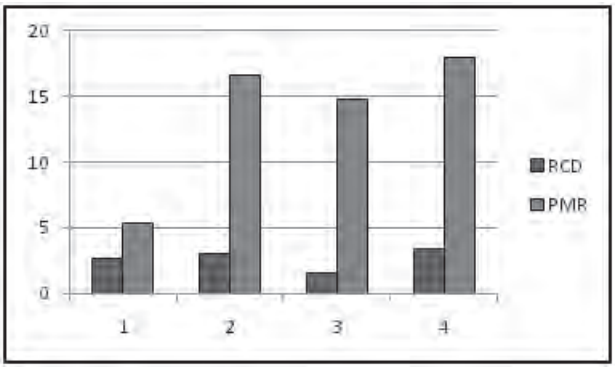


Figure 2: IIn a 1-year follow-up in the groups that were tracked, the subjects still using meal replacements maintained significantly more weight loss than the RCD group.[1]

Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake

Products in the nutrition dotFIT category can satisfy the criteria for smaller meals or be a balanced addition to increase meal size:

- Reduced meal size: busy people often need quick nutrition that can satisfy nutritional needs and deliver energy while keeping calories within a range that allows a healthy weight. Multiple, large, daily meals are not needed for most people today because of low activity in the workplace and during leisure time (sedentary entertainment).[24] And because of the continuous need to sit so we can be transported by vehicles in order to sit somewhere else. Therefore, nutrition dotFIT products can supply an adequate caloric meal as a part of one's overall daily meal planning
- Increase meal size or calorie intake: when weight/muscle gain is the goal and it becomes difficult to increase the consumption of traditional foods in order to continue to add lean body mass (LBM), nutrition dotFIT products offer the ideal solution. Easy/convenient to consume preparations can be added to any meal or daily menu plan to deliver exactly what's needed so surplus nutrients/calories are incorporated into muscle tissues rather than body fat when appropriate resistance exercise is included[25,26,27,28]

Snack between meals as an energy boost or hunger killer

Convenient for snacking to deliver quick energy or to take the edge off hunger without running up the calories. When hunger "nags", nutrition dotFIT products can satisfy the desire to snack on less healthy or poorly satiating foods. Using these products for snacking may also decrease the amount of food consumed in the subsequent meal or keep you from making an inappropriate food choice (e.g. decadent high calorie meal driven by an uncontrolled craving) as often happens when extra hungry and especially during weight loss.

Pre- and post-exercise/activity energy and recovery supplement

Because of the length of time it takes to digest and absorb the nutrients from traditional meals, whole/traditional food meals cannot deliver the required nutrients within a timeframe that allows maximum results induced by exercise when compared to the proper use of quick digesting specialized formulas.[25,27,29,30]

All proteins sticks, bars, cookies, and shakes meet the necessary "quick digestion", carbohydrate and protein content criteria that have been shown to deliver an increase in energy, maximize recovery and increase muscular development when consumed before[28,29,31] and after exercise.[25,32,33] Although dotFIT liquid pre- and post-feedings (mixes or ready-to-drinks) have the fastest absorption time, when they are not an option based on venue or preference, all other nutrition dotFIT products make a convenient and effective alternative when attempting to maximize the training induced "windows of growth".

Metabolic windows of growth

Immediately following exercise, muscle cell nutrient uptake is at its highest point of the day and therefore

this "window of opportunity" requires a well-designed, fast-acting formula.[26,31]

Virtually all studies have demonstrated that the inclusion of "immediate" pre- & post-training fast-acting carbohydrate/sugars and protein feedings can stimulate muscle protein synthesis (MPS)[29,34,35,36,37] and reduce muscle damage to a far greater extent than normal meals/feeding patterns.[26,29,33] In other words, no matter how well you eat throughout the day, you recover faster and build more muscle and strength by including these quickly absorbed pre- and post-exercise formulas (see Figure 3).[27,29,38] Simply put, the post exercise feeding activates the muscle building that takes place during this period – and without it there is little to no protein synthesis during this timeframe.

We also recently discovered that although the post training metabolic window is active for as much as 60-90 minutes, its maximum activity (greatest nutrient uptake and protein synthesis capabilities) takes place immediately at the end of the training session.[27,30,37] From that point on, the longer you wait to supply the proper nutrients or the more time they take to get to the affected tissues, the less muscle building or recovery takes place during this period and can't be made up for at any other point in time.

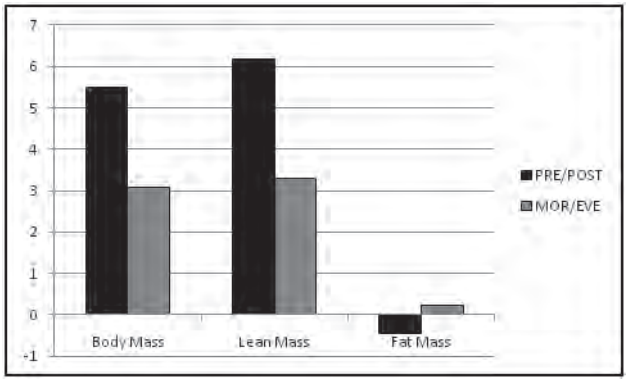


Figure 3: Training results from 23 experienced recreational bodybuilders resistance training for 10 weeks with all things (diet, supplements, training, etc.) equal except the addition of pre/post feedings yielded significantly greater gains in body mass, LBM, strength and reduction in fat mass for the pre/post feeding subjects.[27]

The proper pre/post formula

There is no longer a debate whether pre- and post-workout feedings enhance exercise-induced results. Volumes of peer review literature and studies continue to not only validate this now established fact, but also document the proper formulas.[39,40,41]

The formulas used in scientific studies are all relatively the same: within the range of 1.5-4 parts carbohydrate (CHO) to 1 part protein and low to no fat. The CHO range is based on the activity being studied – the longer the workout the higher the carbohydrate/sugar content. This formula produces the desired results i.e. quick, lasting energy, faster recovery and more muscle and strength gains from the workout.

The carbohydrate mixture must contain the proper amounts of simple, fast-acting sugars because the sugars/energy must enter the body quickly or the product loses effectiveness.[36,42,43] All formulas include complexes that contain glucose polymers in order to deliver immediate and consistent energy.[25,26,43,44] The formulas need to contain the right of amount of amino and fatty acids, which besides their role in muscle building, are also instrumental in managing the speed at which the carbohydrates continue to enter the body,[45] allowing the recipient higher but consistent energy levels throughout the desired period.

By consuming the same ingredients (as the post-workout formula) before the workout, we not only improve the user's training energy levels, we can also enhance the recovery and muscle building process to a greater extent than solely ingesting the post-workout formula.

Although recovery primarily takes place after the workout, you can help speed and enhance the process before you start exercise by ingesting the formula 10-40 minutes before the workout (always make sure

your pre-training, full food meal is eaten 2-3 hours before exercise unless you train first thing in the morning and time does not permit). Proper carbohydrate/sugar content is important because it stimulates insulin production and insulin is our body's most anabolic hormone thus "king" when it comes to building muscle.[46,47] Not only does this hormone start and continue the entire muscle-building process, but insulin also helps minimize the damage caused by exercise.[46,47,48] Insulin blunts the exercise induced production of the catabolic hormone cortisol, which "tears down" muscle tissue. Increasing insulin levels at proper times allows the body to spend more incoming nutrients and time building muscles rather than using everything to simply repair muscle.[29,47,48] By ingesting the right drink pre-exercise, carbohydrates (CHO) not only supply workout energy but also kick-off the necessary insulin release that will work to mitigate the exercise-induced damage. When you repeat the process immediately post-workout, you quickly restore energy (glycogen) while stimulating a renewed insulin release, which initiates and enhances the muscle-building hormone process/cascade thus recovery and results.

Recently pre and post feedings of carbohydrate and protein have also demonstrated the abilities to: reduce delayed onset of muscle soreness (DOMS),[29,36,49] improve competitive performance,[28,37,49] enhance immune function by decreasing exercise induced neutrophil degranulation,[32] speed the recovery of neuromuscular functions after heavy training[33] and increase the cell signaling related to protein synthesis,[37] all compared to placebo and/or no immediate pre and post exercise/training feedings.

Guiltless dessert

All nutrition dotFIT can serve as great tasting, healthy low calorie desserts and can satisfy any "sweet-tooth".

Products in the nutrition dotFIT category have wonderful flavors and textures with the macronutrient blend (protein, fat and carbohydrate ratios) designed to satisfy the appetite for far fewer calories than it would normally take using traditional desserts.

Typical Use

Use as needed to satisfy any of the stated goals:

- Weight control for portion control and accurate calorie counts
- Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake
- Snack between meal as an energy boost or hunger killer
- Pre- and post-exercise/activity energy and recovery supplement
- Guiltless dessert

Summary

Purpose

- Products in the nutrition dotFIT category supply nutrient-rich, convenient between-meal snacks to boost energy, curb hunger and assist in weight control
- Can also be used to increase daily caloric intake when unable to do so by consuming whole food
- Pre- and post-workout snack to enhance energy and recovery
- Can be used during training
- Can be used as a guiltless dessert
- A healthy, convenient food assortment designed to be integrated into your daily meal planning in order to assist you in reaching and maintaining your sport and fitness goals. All products in the nutrition dotFIT line can be selected based on taste, preference, venue, size and shape or calorie requirements for any of the above goals

Unique Features

- Products in the nutrition dotFIT category are designed in a synergistic relationship with all dotFIT products and a person's traditional food intake. These products are NOT spiked with unnecessary nutrients. Most other products in this space (e.g. bars, shakes, ready to drinks, etc.) are heavily spiked with nutrients that can lead to undesirable levels within the body when combining multiple manufacturers, products and normal food intake. When consuming only dotFIT products as directed

with one's normal daily food intake, the recipient is assured of keeping the body at a safe

and optimal nutrient level

- A good source of calcium and fiber
- An excellent source of protein
- Formulated and manufactured for great taste and pleasing texture, all nutrition dotFIT products meet or exceed the FDA's guideline for "High Protein" and foods are microwaveable
- Bars, protein sticks, cookies, etc., are handmade and baked with high quality ingredients
- Third-party testing: Commitment to producing world-class products is our #1 priority. Rigorous testing, both in-house and through third-party FDA approved laboratories, assures that at all nutritional claims meet or surpass FDA guidelines, USDA guidelines, and industry norms

References

1 Heymsfield SB, van Mierlo CA, van der Knaap HC, Heo M, Frier HI. Weight management using a meal replacement strategy: meta and pooling analysis from six studies. Int J Obes Relat Metab Disord. 2003 May;27(5):537-49.

2 Ashley JM, St Jeor ST, Perumean-Chaney S, Schrage J, Bovee V. Meal replacements in weight intervention. Obes Res. 2001 Nov;9 Suppl 4:312S-320S.

3 Ditschuneit HH. Do meal replacement drinks have a role in diabetes management? Nestle Nutr Workshop Ser Clin Perform Programme. 2006;11:171-9; discussion 179-81. Review.

4 Li Z, Hong K, Saltsman P, DeShields S, Bellman M, Thames G, Liu Y, Wang HJ, Elashoff R, Heber D. Long-term efficacy of soy based meal replacements vs an individualized diet plan in obese type II DM patients: relative effects on weight loss, metabolic parameters, and C-reactive protein. Eur J Clin Nutr. 2005 Mar;59(3):411-8.

5 Poston WS, Haddock CK, Pinkston MM, Pace P, Karakoc ND, Reeves RS, Foreyt JP. Weight loss with meal replacement and meal replacement plus snacks: a randomized trial. Int J Obes (Lond). 2005 Sep;29(9):1107-14.

6 Cheskin LJ, Mitchell AM, Jhaveri AD, Mitola AH, Davis LM, Lewis RA, Yep MA, Lycan TW. Efficacy of meal replacements versus a standard food-based diet for weight loss in type 2 diabetes: a controlled clinical trial. Diabetes Educ. 2008 Jan-Feb;34(1):118- 27.

7 Wal JS, McBurney MI, Cho S, Dhurandhar NV. Ready-to-eat cereal products as meal replacements for weight loss. Int J Food Sci Nutr. 2007 Aug;58(5):331-40.

8 Smith TJ, Sigrist LD, Bathalon GP, McGraw S, Karl JP, Young AJ. Efficacy of a meal-replacement program for promoting blood lipid changes and weight and body fat loss in US Army soldiers. J Am Diet Assoc. 2010 Feb;110(2):268-73.

9 Flechtner-Mors M, Boehm BO, Wittmann R, Thoma U, Ditschuneit HH. Enhanced weight loss with protein-enriched meal replacements in subjects with the metabolic syndrome. Diabetes Metab Res Rev. 2010 Jul;26(5):393-405.

10 Hamdy O, Zwiefelhofer D. Weight management using a meal replacement strategy in type 2 diabetes. Curr Diab Rep. 2010 Apr;10(2):159-64. Review.

11 Jeffery RW, Wing RR, Thorson C, Burton LR, Raether C, Harvey J, Mullen M. Strengthening behavioral interventions for weight loss: a randomized trial of food provision and monetary incentives. J Consult Clin Psychol. 1993 Dec;61(6):1038-45

12 McCarron DA, Oparil S, Chait A, Haynes RB, Kris-Etherton P, Stern JS, Resnick LM, Clark S, Morris CD, Hatton DC, Metz JA, McMahon M, Holcomb S, Snyder GW, Pi-Sunyer FX. Nutritional management of cardiovascular risk factors. A randomized clinical trial. Arch Intern Med. 1997 Jan 27;157(2):169-77.

13 Wing RR, Jeffery RW. Food provision as a strategy to promote weight loss. Obes Res. 2001 Nov;9 Suppl 4:271S 275S. Review.

14 Wing RR, Jeffery RW, Burton LR, Thorson C, Nissinoff KS, Baxter JE. Food provision vs structured meal plans in the behavioral treatment of obesity. Int J Obes Relat Metab Disord. 1996 Jan;20(1):56-62.

15 Stull AJ, Apolzan JW, Thalacker-Mercer AE, Iglay HB, Campbell WW. Liquid and solid meal replacement products differentially affect postprandial appetite and food intake in older adults. J Am Diet Assoc. 2008 Jul;108(7):1226-30.

16 Wadden TA, Butryn ML, Wilson C. Lifestyle modification for the management of obesity. Gastroenterology. 2007 May;132(6):2226-38. Review. Erratum in: Gastroenterology. 2007 Jul;133(1):371.

17 Berkel LA, Poston WS, Reeves RS, Foreyt JP. Behavioral interventions for obesity. J Am Diet Assoc. 2005 May;105(5 Suppl 1):S35-43. Review.
18 Ashley JM, Herzog H, Clodfelter S, Bovee V, Schrage J, Pritsos C. Nutrient adequacy during weight loss interventions: a randomized study in women comparing the dietary intake in a meal replacement group with a traditional food group. Nutr J. 2007 Jun 25;6:12.
19 Abbot JM, Thomson CA, Ranger-Moore J, Teixeira PJ, Lohman TG, Taren DL, Cussler E, Going SB, Houtkooper LB. Psychosocial and behavioral profile and predictors of self-reported energy underreporting in obese middle-aged women. J Am Diet Assoc. 2008 Jan;108(1):114-9.
20 Levitsky DA, Youn T. The more food young adults are served, the more they overeat. J Nutr. 2004 Oct;134(10):2546-9.
21 Wansink B, Painter JE, North J. Bottomless bowls: why visual cues of portion size may influence intake. Obes Res. 2005 Jan;13(1):93-100.
22 Rolls BJ, Roe LS, Meengs JS. Reductions in portion size and energy density of foods are additive and lead to sustained decreases in energy intake. Am J Clin Nutr. 2006 Jan;83(1):11-7.
23 Jeffery RW, Wing RR, Thorson C, Burton LR, Raether C, Harvey J, Mullen M. Strengthening behavioral interventions for weight loss: a randomized trial of food provision and monetary incentives. J Consult Clin Psychol. 1993 Dec;61(6):1038-45
24 Gordon-Larsen P, Nelson MC, Popkin BM. Longitudinal physical activity and sedentary behavior trends: adolescence to adulthood. Am J Prev Med. 2004 Nov;27(4):277-83. Erratum in: Am J Prev Med. 2005 Jun;28(5):496. Am J Prev Med. 2006 Oct;31(4):353.
25 Rasmussen BB, Tipton KD, Miller SL, Wolf SE, Wolfe RR. An oral essential amino acid-carbohydrate supplement enhances muscle protein anabolism after resistance exercise. J Appl Physiol. 2000 Feb;88(2):386-92.
26 Baty JJ, Hwang H, Ding Z, Bernard JR, Wang B, Kwon B, Ivy JL. The effect of a carbohydrate and protein supplement on resistance exercise performance, hormonal response, and muscle damage. J Strength Cond Res. 2007 May;21(2):321-9.
27 Cribb PJ, Hayes A. Effects of supplement timing and resistance exercise on skeletal muscle hypertrophy. Med Sci Sports Exerc. 2006 Nov;38(11):1918-25.
28 Cathcart AJ, Murgatroyd SR, McNab A, Whyte LJ, Easton C. Combined carbohydrate-protein supplementation improves competitive endurance exercise performance in the heat. Eur J Appl Physiol. 2011 Jan 23. [Epub ahead of print]
29 Cockburn E, Stevenson E, Hayes PR, Robson-Ansley P, Howatson G. Effect of milk-based carbohydrate-protein supplement timing on the attenuation of exercise-induced muscle damage. Appl Physiol Nutr Metab. 2010 Jun;35(3):270-7.
30 Beelen M, Burke LM, Gibala MJ, van Loon L JC. Nutritional strategies to promote postexercise recovery. Int J Sport Nutr Exerc Metab. 2010 Dec;20(6):515-32.
31 Tipton KD, Rasmussen BB, Miller SL, Wolf SE, Owens-Stovall SK, Petrini BE, Wolfe RR. Timing of amino acid-carbohydrate ingestion alters anabolic response of muscle to resistance exercise. Am J Physiol Endocrinol Metab. 2001 Aug;281(2):E197-206.
32 Costa RJ, Oliver SJ, Laing SJ, Waiters R, Bilzon JL, Walsh NP. Influence of timing of postexercise carbohydrate-protein ingestion on selected immune indices. Int J Sport Nutr Exerc Metab. 2009 Aug;19(4):366-84.
33 Blacker SD, Williams NC, Fallowfield JL, Bilzon JLj, Willems ME. Carbohydrate vs protein supplementation for recovery of neuromuscular function following prolonged load carriage. J Int Soc Sports Nutr. 2010 Jan 12;7:2.
34 Koopman R, Wagenmakers AJ, Manders RJ, Zorenc AH, Senden JM, Gorselink M, Keizer HA, van Loon LJ. Combined ingestion of protein and free leucine with carbohydrate increases postexercise muscle protein synthesis in vivo in male subjects. Am J Physiol Endocrinol Metab. 2005 Apr;288(4):E645-53. Epub 2004 Nov 23.
35 Esmarck B, Andersen JL, Olsen S, Richter EA, Mizuno M, Kjaer M. Timing of postexercise protein intake is important for muscle hypertrophy with resistance training in elderly humans. J Physiol. 2001 Aug 15;535(Pt 1):301-11.
36 Betts JA, Williams C. Short-term recovery from prolonged exercise: exploring the potential for protein ingestion to accentuate the benefits of carbohydrate supplements. Sports Med. 2010 Nov 1;40(11):941-59. doi: 10.2165/11536900-000000000-00000.
37 Coffey VG, Moore DR, Burd NA, Rerecich T, Stellingwerff T, Garnham AP, Phillips SM, Hawley JA.

Nutrient provision increases signalling and protein synthesis in human skeletal muscle after repeated sprints. Eur J Appl Physiol. 2010 Dec 17. [Epub ahead of print]
38 Paddon-Jones D, Sheffield-Moore M, Aarsland A, Wolfe RR, Ferrando AA. Exogenous amino acids stimulate human muscle anabolism without interfering with the response to mixed meal ingestion. Am J Physiol Endocrinol Metab. 2005 Apr;288(4):E761-7. Epub 2004 Nov 30.
39 Cockburn E, Hayes PR, French DN, Stevenson E, St Clair Gibson A. Acute milk-based protein-CHO supplementation attenuates exercise-induced muscle damage. Appl Physiol Nutr Metab. 2008 Aug;33(4):775-83.
40 Luden ND, Saunders MJ, Todd MK. Postexercise carbohydrate-protein- antioxidant ingestion decreases plasma creatine kinase and muscle soreness. Int J Sport Nutr Exerc Metab. 2007 Feb;17(1):109-23.
41 Millard-Stafford M, Childers WL, Conger SA, Kampfer AJ, Rahnert JA. Recovery nutrition: timing and composition after endurance exercise. Curr Sports Med Rep. 2008 Jul-Aug;7(4):193-201. Review.
42 Campbell C, Prince D, Braun M, Applegate E, Casazza GA. Carbohydrate-supplement form and exercise performance. Int J Sport Nutr Exerc Metab. 2008 Apr;18(2):179-90.
43 Jentjens RL, Underwood K, Achten J, Currell K, Mann CH, Jeukendrup AE. Exogenous carbohydrate oxidation rates are elevated after combined ingestion of glucose and fructose during exercise in the heat. J Appl Physiol. 2006 Mar;100(3):807- 16. Epub 2005 Nov 10.
44 Jentjens RL, Moseley L, Waring RH, Harding LK, Jeukendrup AE. Oxidation of combined ingestion of glucose and fructose during exercise. J Appl Physiol. 2004 Apr;96(4):1277-84. Epub 2003 Dec 2.
45 Dreyer HC, Drummond MJ, Pennings B, Fujita S, Glynn EL, Chinkes DL, Dhanani S, Volpi E, Rasmussen BB. Leucine-enriched essential amino acid and carbohydrate ingestion following resistance exercise enhances mTOR signaling and protein synthesis in human muscle. Am J Physiol Endocrinol Metab. 2008 Feb;294(2):E392-400. Epub 2007 Dec 4.
46 Miller SL, Tipton KD, Chinkes DL, Wolf SE, Wolfe RR. Independent and combined effects of amino acids and glucose after resistance exercise. Med Sci Sports Exerc. 2003 Mar;35(3):449-55.
47 Kimball SR, Farrell PA, Jefferson LS. Invited Review: Role of insulin in translational control of protein synthesis in skeletal muscle by amino acids or exercise. J Appl Physiol. 2002 Sep;93(3):1168-80. Review.
48 Wojtaszewski JF, Nielsen JN, Richter EA. Invited review: effect of acute exercise on insulin signaling and action in humans. J Appl Physiol. 2002 Jul;93(1):384-92. Review.
49 Saunders MJ, Moore RW, Kies AK, Luden ND, Pratt CA. Carbohydrate and protein hydrolysate coingestions improvement of late-exercise time-trial performance. Int J Sport Nutr Exerc Metab. 2009 Apr;19(2):136-49.

Ready-to-Eat Bars and Baked Goods

(See complete SRG for individual formulas)

Positioning

A healthy convenient food assortment designed to be integrated into your daily meal planning in order to assist you in reaching and maintaining your sport and fitness goals. All products in the nutrition dotFIT line can be selected based on taste, preference, venue, size and shape or calorie requirements for any of the typical uses listed below.

Unique features

- Contains multiple high quality protein sources
- Products in the nutrition dotFIT category are designed in a synergistic relationship with all dotFIT products and a person's traditional food intake. These products are NOT spiked with unnecessary nutrients. Most other products in this space (e.g. bars, shakes, ready to drinks, etc.) are heavily spiked with many nutrients that can lead to undesirable levels within the body when combining multiple manufactures, products and normal food intake. Because of our product synergy, use of our complete product line promotes safe and optimal daily nutrient intake
- Formulated and manufactured for great taste and pleasing texture, all products in the nutrition dotFIT category meet or exceed the FDA's guideline for "High Protein" and foods are microwaveable
- Bars, protein sticks, cookies, etc., are handmade and baked with high quality ingredients
- Third-party testing: Commitment to producing world-class products is our #1 priority. Rigorous testing, both in-house and through third-party, FDA-approved laboratories, assures our clients that all nutritional claims meet or surpass FDA guidelines, USDA guidelines, and industry norms

Typical use

Use as needed to satisfy any of the stated goals:

- Weight control for portion control and accurate calorie counts
- Daily menu incorporation as a meal substitute to reduce or increase daily caloric intake
- Between meal snack as an energy boost or hunger killer
- Pre- and post-exercise/activity energy and recovery supplement
- Guiltless dessert

Bar Category Profiles

- dotTREAT
  - Protein 15 grams
  - Carbs 26 grams
  - Fat 8 grams
  - Calories 230
- dotBAR Breakfast Bar
  - Protein 15 grams
  - Carbs 29 grams
  - Fat 5 grams
  - Calories 220
- dotSTICK
  - Protein 12 grams
  - Carbs 26 grams
  - Fat 6 grams
  - Calories 190
- dotBAR Meal Replacement Bars
  - Protein 12-15 grams
  - Carbs 21-23 grams
  - Fat 5-7 grams
  - Calories 160-200

Appendix

Appendix I

dotFIT Worldwide's Position on Vitamin & Mineral Supplementation

Content utilized by permission from The National Academy of Sports Medicine

Abstract

Defining the perfect diet has been a laborious task for the nutritional sciences for decades. Likewise, specifying the optimal intake of vitamins and minerals is difficult in the face of continuing nutrient research. This makes giving concrete nutrient recommendations challenging. For most nutrients, there is a large therapeutic range within which the average person will receive benefit and simultaneously remain below the threshold that can yield adverse events. It is one matter to define nutrient recommendations and another to actually consume the recommended dosages through the course of a normal day with typical foods. The notion that you will satisfy all physiological needs of the body for proper and ideal nutrient intake with food alone is impractical and outdated. Some of the obstacles to proper eating and ideal nutrient intake include insufficient food intake, increased needs that are not met by food alone, and dislike or avoidance of essential food groups.

Therefore, at worst vitamin and mineral supplementation acts as insurance against short and long-term dietary lapses, and guesswork in nutrient intake, including the ability to define the optimal diet. At best, using valid science to increase the nutrient content of available and typical food intakes may yield optimal functioning for an extended period, as compared to a non-supplemented state.

Introduction

The notion of vitamin and mineral supplementation, including the fortification of food, began with the intent to supply essential dietary nutrients significantly lacking in some geographical regions and to shore up inadequate nutrient content of the general population's typical food intake to meet the Recommended Dietary Allowances (RDAs). Without supplementation, severe nutritional deficiencies would be widespread, as they once were.[1]

The RDAs are, by definition, "the levels of intake of essential nutrients that, on the basis of scientific knowledge, are judged by the Food and Nutrition Board to be adequate to meet the known (current) nutrient needs of practically all (97-98% of the population) healthy persons."[2] They are not intended to be final, minimal or optimal. Rather, RDAs and the Dietary Guidelines are designed to prevent nutritional deficiencies by providing Americans with goals for adequate nutrient intake that most are not reaching.[3,4,5,6,7,8,9,10,11]

Dietary nutrient recommendations for achieving health are continuously being revised and generally trend upward as the scientific community gathers more data related to how different nutrient intake levels may affect overall health and longevity. Therefore, rather than simply updating the RDAs, which are set only for the average person to avoid deficiencies, the US Food and Nutrition Board, now an element of the Institute of Medicine, released the new Dietary Reference Intakes (DRIs) in 1994 and have updated them since. These evidence-based standards go beyond amending deficiencies; they also suggest the amount of nutrients needed for enhancing health. DRIs are as follows:

The Recommended Dietary Allowance (RDA) is the average daily dietary intake level that is sufficient to meet the nutrient requirements of nearly all (97 to 98 percent) healthy individuals in a specific life stage and gender group. The RDA is intended primarily for use as a goal for daily intake by individuals.[12]

Estimated Average Requirement (EAR) is the daily intake value that is estimated to meet the requirement, as defined by the specified indicator of adequacy, in 50 percent of the individuals in a life stage or gender group. At this level of intake, the other 50 percent of individuals in a specified group would not have their nutritional needs met. The EAR is used in setting the RDA.[12]

Adequate intake level (AI) is a value based on experimentally derived intake levels or approximations of observed mean nutrient intakes by a group (or groups) of healthy people.[12]

The Tolerable Upper Intake Level (UL) is the highest level of daily nutrient intake that is likely to pose no risks of adverse health effects in almost all individuals in the specified life stage group. As intake increases above the UL, the risk of adverse effects may increase. The intent is to set the UL so that it is below the threshold of even the most sensitive members of a group.[12]

However, despite the efforts of the scientific community, including the Food and Nutrition Board of the National Research Council and its DRIs, the general population is not meeting the majority of the requirements for vitamins and minerals. According to "What We Eat In America, NHANES," Americans meet very few of the standards for dietary adequacy.[9] All recent nutrient intake surveys have shown the same results: virtually no one gets the recommended amounts of all nutrients from food alone.[13]

Why the Inadequacies?

1. The majority of the general population does not have the ability to properly analyze foods, much less buy, prepare and consume each in the proper array to meet daily requirements.[14,15]

2. Today's sedentary environment, which is promoted by increasingly inactive jobs, convenient forms of communication, easy access to food, comfort and entertainment, prohibits most of the general population from consuming the calories necessary to reach these recommended nutrient levels without gaining wei ght.[16,17,18,19,20,21,22,23,24,25,26,27,28,29] In addition, because of the lack of movement in today's society, the large portion of the American adult population participating in weight reducing diets are forced to severely restrict food intake in order to sustain weight loss, a condition that all but assures nutrient inadequacies without supplementation.[30,31,32]

3. In general, food preferences established early in life keep people from more diverse nutritional choices. For most, the early introduction of sugar and fatty convenient foods (e.g. fast food outlets) creates addictions to these types of food, leaving many undernourished in terms of the RDAs for the long term. In other words, the foods most people normally choose are high in energy but low in nutrients.[33,34,35]

4. Available nutritional information regarding particular foods is not necessarily accurate. The true nutritional content of a given food is dependent upon such factors as its origin, time and maturity of its harvest, slaughter, cooking method, processing, and shelf life.[13,36,37] In addition, any calculations are vulnerable to analytical error.[38,39] These factors illustrate that just because a list of nutrients associated with a food is published, those nutrients are not guaranteed to actually enter the body. Performing an ingredient test on each food before it enters the body is not a practical solution.

Vitamin and mineral losses become cumulative. While an argument can be made that the RDAs include a margin of safety to address some of these problems, many of the RDAs are established as "sub-optimal," as demonstrated by the continual upward trend.[40,41] No margin of safety can compensate for a nearly complete lack of an essential nutrient due to any of the above factors, especially soil content. This was illustrated, though inadvertently, in a study conducted by Clark, Combs and Turnbull.[42] The study's subjects were selected from a region in the United States where there is little to no selenium in the soil. The dramatic cancer preventative benefits witnessed in the selenium-supplemented group compared to the placebo users are most likely attributed to the lack of selenium in the food supply from this area. All these uncontrollable issues become the strongest argument in support of the current scientific approach that no matter how well you plan your diet, you need "insurance."[43,44,45]

Even trained professionals struggle with guidelines. In a 1995 study published in the Journal of the American Dietetic Association,[46] dietitians were asked to design diets that met the 1989 RDAs and 1990 Dietary Guidelines while providing 2200-2400 calories (the average non-athletic female gains weight at 1800 calories)[47] and remaining palatable to the individuals in the study. Using software designed specifically for creating a healthy diet, these trained dietitians were unable to accomplish the objective.[46] If health professionals cannot consistently reach the RDAs and dietary guidelines within an average amount of calories that promotes leanness while being universally palatable, how is the general public expected to do so?

Poor nutrition has been linked to an increased risk of many diseases including cancer, heart disease, and diabetes. One highly regarded researcher proposes that nutrient inadequacies may actually illicit a triage response where the body would prioritize the use of lacking nutrients by urgency which, if true, would accelerate cancer, aging, and neural decay but would leave critical metabolic functions intact; basically favoring short-term survival at the expense of long-term health.[48]

Collectively, the aforementioned circumstances strongly suggest nutrient augmentation to food intake in order to meet the existing DRIs, which still may not be optimal[40,41,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68] but are adequate for avoiding deficiency diseases.

Discussion

The original paradigm based on nutritional essentiality is undergoing a shift. Many well-informed health professionals and well-respected institutions are breaking precedent by recommending the use of a multiple vitamin and mineral supplement (VMS) in conjunction with a well-balanced diet.[43,44,49,69,70,71] Aside from the "insurance" value, the changing views on VMS recommendations are also a result of ongoing research into the amount of a nutrient required to prevent a chronic disease from occurring, rather than simply preventing a deficiency state.[2,64,72,73,74,75,76,77] These revised recommendations led to the reconstruction of the RDAs into the Dietary Reference Intakes (DRI).[2,12,78,79,80]

RDA levels of specific nutrients will continue to be revised, and wide ranges of safe and potentially effective intakes established (see Figure 24). This makes it nearly impossible for the general population to reach potentially beneficial amounts while remaining within a calorie level that would promote healthy body fat levels without supplementation.[47,50,75,81,82,83] The DRIs provide a new framework within which recommendations of nutrient intake and clear health benefits can be established.

Establishing beneficial nutrient levels with little to no risk

The issue still pending is just how much of each nutrient is needed, in general, to receive an optimal physiological response that fulfills the potential for health and performance. Though these exact amounts are currently unknown and will always vary by individual, volumes of information exist on approximate values within a wide range of safety that suggest efficacy for the general population.40,41 In other words, the benefits of doses properly extrapolated from current research would greatly outweigh any unlikely risks from these doses, especially when compared to the risks resulting from no supplementation at all.

Using information available today, we must consider three levels of nutrient activity:

1. The amount of the nutrient to prevent overt deficiency disease.[14] (Approximately between two-thirds of the current RDAs and the actual RDAs.)
2. When applicable, the amount of a nutrient that may support optimal benefits.[42,54,60,61,62,63,64,65,66,84,85] (Approximately between the current RDAs and the No Observed Adverse Effect Level (NOAEL).)
3. The amount of a nutrient that may cause adverse reactions.[40,41,86] (Lowest Observed Adverse Effect Level (LOAEL) and higher.)

Figure 24 illustrates how, within a wide range of safety, the amount of a nutrient required to achieve optimal benefits in performance and health can be approximated. As the concentrations of nutrient intake increases, different levels of biological function (total benefits) are approached.

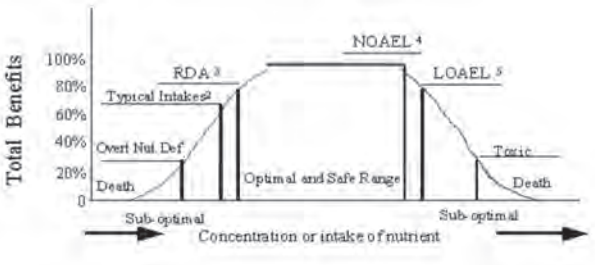


Figure 1: Ultimate Goal of Nutrient Augmentation (RDA = Recommended Dietary Allowances, NOAEL = No Observed Adverse Effect Level)

1. Overt nutritional deficiency.
2. Typical intakes (2/3 of RDA, thus sub-optimal).
3. The RDAs, which we have established as sub-optimal for many nutrients.
4. NOAEL – A safe intake greater than the RDAs, and it is likely between this nutrient amount and its RDA where the optimal level of intake exists.
5. LOAEL – An intake that is not safe for all consumers therefore should generally be considered sub-optimal.

Safe and beneficial dosages

Cautious review of existing information following the criteria in Figure 1 suggests total nutrient intake to fall somewhere within the ranges shown in Table 1. Any nutrient not appearing in the table indicates that too little information exists to establish a range. There¬fore, consuming a balanced diet will presumably meet the currently known need. These totals include the nutrient content of food intake and supplementation. Considering most nutrient ranges shown in Table 7 fall well within known safety margins and the often small contribution food makes to most of these desired levels, it would generally not be necessary for individuals to compile the nutrient content of daily food intake. Respecting this, daily supplementation should be no higher (maybe lower when marked) than the upper amount listed, which is commonly well below the tolerable upper limit. More active individuals may maintain intakes closer to the higher side of the range. Recently, it has been proposed that the age and gender of an adult determines the appropriate levels of certain nutrients.

These doses, even at the high end, are meant to enhance natural physiology (fulfilling potential related to health). They are not in pharmacological amounts that would be used to treat symptoms of disease. The use of vitamins and minerals for therapy should be conducted by a qualified physician.

Table 1: Safe and Probable Optimal Range Including Food Sources

Nutrient	Low – High	Upper limit (UL)	LOAEL
Pre-formed Vitamin A[1]	0 IU - 10,000 IU	10,000 IU (3000 mcg)	21,645 IU
Beta Carotene[1]	10,000 IU - 25,000 IU	–	–
Vitamin D (D3)	400 IU – 800 IU	2000 IU	3800 IU*
Vitamin E	100 IU – 800 IU	1,500 IU (1000 mg)	–
Vitamin K	60-120 mcg	–	–
Vitamin C	200 mg – 1000 mg	2,000 mg	3,000 mg
Vitamin B5	2 mg – 30 mg	–	–
Vitamin B2	5 mg – 30 mg	–	–
Vitamin B3 (niacinamide)	30 mg – 50 mg	35 mg	1000 mg
Vitamin B6	6 mg – 50 mg	100 mg	500 mg
Folic acid	400 mcg – 900 mcg	1,000 mcg	5,000 mcg
Vitamin B12	6 mcg – 50 mcg	–	–
Calcium[2]	1200 mg – 2000 mg	2,500 mg	5,000 mg
Magnesium[2]	420 mg – 600 mg	350 mg[2]	350 mg
Iodine	150 mcg - ?	1,100 mcg	1,700 mcg
Iron[2]	15 mg – 25 mg	45 mg	70 mg
Zinc[2]	15 mg – 30 mg	40 mg	60 mg
Copper	2 mg – 4 mg	10 mg	–
Manganese	2 mg – 5 mg	11 mg	15 mg
Potassium	2000 mg -?	–	–
SeleniumError! Bookmark not defined.	200 mcg – 250 mcg	400 mcg	910 mcg
Chromium	200 mcg – 1000 mcg	–	–

1 Supplemental amount can be zero if daily intake of beta carotene is within the safe and optimal range.
2 Smokers, those likely to develop, or those that already have lung cancer, should avoid beta carotene supplementation.

* Currently being revisited.
3 Upper range amount is from supplements only.
4 From supplements only.
5 Supplemental amounts should be close to the low numbers shown.

Table 7 has been established as safe for the general population and may prove to be highly beneficial.

Proper intake

The synergy of these nutrients, including their daily levels, require they be consumed together but distributed as equally throughout a 24 hour period as possible to avoid over-saturation and losses. Individuals should start by following a healthy food plan as closely as possible, including a calorie intake that promotes healthy body fat levels, and adding a controlled-release multiple vitamin and mineral preparation to meet the appropriate nutrient levels.

Using an acceptable pill size, these amounts could be reached through ingestion of a multiple vitamin and mineral formula one to two times daily with meals. Generally, a separate calcium and Vitamin D supplement may need to be included in order to reach desired levels, which would also be consumed in split doses. This method helps maintain tissue target levels throughout the day, as opposed to consuming the total amount at one time which would diminish the desired result.

Conclusion

Vitamins and minerals ingested as described may allow the body to operate at full capacity without disturbing its natural physiology. The belief that individuals consume each health and performance-related compound in optimal doses, ratios and at proper times from food every day is unfounded, especially when all obstacles are taken into account, including the inability to define these levels. In addition, it is common knowledge that the general population does not consume more than what is needed of all necessary substances in their diets. These issues collectively indicate that any nutrient contributing to cellular health and perform¬ance has the potential to be lacking when food is the only delivery system.

Because of the safety margins of most nutrients, and paying strict attention to tolerable upper limits, distinctions can be made between the strongest possible evidence and instances where the evidence becomes strong enough regarding ingesting levels of nutrients that show potential in staving off chronic disease. In other words, when supplementing properly, potential benefits would greatly outweigh any unlikely risks. Therefore, at worst vitamin and mineral supplementation acts as insurance against short and long term dietary lapses, and guesswork in nutrient intake, including the ability to define the optimal diet. At best, using valid science to increase the nutrient content of available and typical food intakes may yield optimal functioning for an extended period, as compared to a non-supplemented state.

References

1 McCollum EV. A History of Nutrition. Boston: Houghton Mifflin Co.;1957 (Chapters 14-20, 27).
2 Institute of Medicine, Food and Nutrition Board. How should the recommended dietary allowances be revised? Washington, DC: National Academy Press, 1994.
3 Frary CD, Johnson RK, Wang MQ. Children and adolescents' choices of foods and beverages high in added sugars are associated with intakes of key nutrients and food groups. J Adolesc Health. 2004 Jan;34(1):56-63.
4 Guenther PM, Dodd KW, Reedy J, Krebs-Smith SM. Most Americans eat much less than recommended amounts of fruits and vegetables. J Am Diet Assoc. 2006 Sep;106(9):1371-9.
5 Hanson NI, Neumark-Sztainer D, Eisenberg ME, Story M, Wall M. Associations between parental report of the home food environment and adolescent intakes of fruits, vegetables and dairy foods. Public Health Nutr. 2005 Feb;8(1):77-85.
6 Kranz S, Siega-Riz AM, Herring AH. Changes in diet quality of American preschoolers between 1977 and 1998. Am J Public Health. 2004 Sep;94(9):1525-30.
7 Mannino ML, Lee Y, Mitchell DC, Smiciklas-Wright H, Birch LL. The quality of girls' diets declines and

tracks across middle childhood. Int J Behav Nutr Phys Act. 2004 Feb 27;1(1):5.
8 Suitor CW, Gleason PM. Using Dietary Reference Intake-based methods to estimate the prevalence of inadequate nutrient intake among school-aged children. J Am Diet Assoc. 2002 Apr;102(4):530-6.
9 Department of Agriculture (US). Factsheet on What We Eat in America NHANES 2005-2006. http://www.ars.usda.gov/Services/docs.htm?docid=17041
10 Serdula MK, Gillespie C, Kettel-Khan L, Farris R, Seymour J, Denny C. Trends in fruit and vegetable consumption among adults in the United States: behavioral risk factor surveillance system, 1994-2000. Am J Public Health. 2004 Jun;94(6):1014-8.
11 Beals KA. Eating behaviors, nutritional status, and menstrual function in elite female adolescent volleyball players. J Am Diet Assoc. 2002 Sep;102(9):1293-6.
12 Murphy SP, Barr SI. "Dietary Reference Intakes for Vitamins." Handbook of Vitamins. Ed. Zempleni J et al. CRC Press: Boca Raton, 2007. 560-561.
13 Briefel RR, Johnson CL. Secular trends in dietary intake in the United States. Annu Rev Nutr. 2004;24:401-31. Review.
14 Murphy SP, Barr SI. Challenges in using the dietary reference intakes to plan diets for groups. Nutr Rev. 2005 Aug;63(8):267-71. Review.
15 Kuehn BM. Experts charge new US dietary guidelines pose daunting challenge for the public. JAMA. 2005 Feb 23;293(8):918-20.
16 Kim SH, Kim HY, Kim WK, Park OJ. Nutritional status, iron-deficiency-related indices, and immunity of female athletes. Nutrition. 2002 Jan;18(1):86-90.
17 Wang MC, Cubbin C, Ahn D, Winkleby MA. Changes in neighbourhood food store environment, food behaviour and body mass index, 1981--1990. Public Health Nutr. 2008 Sep;11(9):963-70. Epub 2007 Sep 26.
18 Nead KG, Halterman JS, Kaczorowski JM, Auinger P, Weitzman M. Overweight children and adolescents: a risk group for iron deficiency. Pediatrics. 2004 Jul;114(1):104-8.
19 Lowry R, Lee SM, McKenna ML, Galuska DA, Kann LK. Weight management and fruit and vegetable intake among US high school students. J Sch Health. 2008 Aug;78(8):417-24; quiz 455-7.
20 Bachman JL, Reedy J, Subar AF, Krebs-Smith SM. Sources of food group intakes among the US population, 2001-2002. J Am Diet Assoc. 2008 May;108(5):804-14.
21 Park J, Beaudet MP. Eating attitudes and their correlates among Canadian women concerned about their weight. Eur Eat Disord Rev. 2007 Jul;15(4):311-20.
22 Hill AJ. Motivation for eating behaviour in adolescent girls: the body beautiful. Proc Nutr Soc. 2006 Nov;65(4):376-84. Review.
23 Malinauskas BM, Raedeke TD, Aeby VG, Smith JL, Dallas MB. Dieting practices, weight perceptions, and body composition: a comparison of normal weight, overweight, and obese college females. Nutr J. 2006 Mar 31;5:11.
24 Jankauskiene R, Kardelis K, Pajaujiene S. Body weight satisfaction and weight loss attempts in fitness activity involved women. J Sports Med Phys Fitness. 2005 Dec;45(4):537-45.
25 Harris MB. Weight concern, body image, and abnormal eating in college women tennis players and their coaches. Int J Sport Nutr Exerc Metab. 2000 Mar;10(1):1-15.
26 Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of overweight and obesity in the United States, 1999-2004. JAMA. 2006 Apr 5;295(13):1549-55.
27 JD Wright, MPH, J Kennedy-Stephenson, MS, CY Wang, PhD, MA McDowell, MPH, CL Johnson, MSPH. Trends in Intake of Energy and Macronutrients --- United States, 1971—2000. National Center for Health Statistics, CDC. February 6, 2004 / 53(04);80-82
28 Gabel KA. Special nutritional concerns for the female athlete. Curr Sports Med Rep. 2006 Jun;5(4):187-91. Review.
29 Ziegler P, Sharp R, Hughes V, Evans W, Khoo CS. Nutritional status of teenage female competitive figure skaters. J Am Diet Assoc. 2002 Mar;102(3):374-9.
30 Dwyer JT, Allison DB, Coates PM. Dietary supplements in weight reduction. J Am Diet Assoc. 2005 May;105(5 Suppl 1):S80-6. Review.
31 National Institutes of Health. Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults—The Evidence Report. National Institutes of Health. Obes Res. 1998; 6(suppl 2):S51-S209.
32 Cifuentes M, Riedt CS, Brolin RE, Field MP, Sherrell RM, Shapses SA. Weight loss and calcium intake influence calcium absorption in overweight postmenopausal women. Am J Clin Nutr. 2004;80:123-130.

33 Harnack L, Walters SA, Jacobs DR Jr. Dietary intake and food sources of whole grains among US

children and adolescents: data from the 1994-1996 Continuing Survey of Food Intakes by Individuals. J Am Diet Assoc. 2003 Aug;103(8):1015-9.
34 Frary CD, Johnson RK, Wang MQ. Children and adolescents' choices of foods and beverages high in added sugars are associated with intakes of key nutrients and food groups. J Adolesc Health. 2004 Jan;34(1):56-63.
35 Guthrie JF, Morton JF. Food sources of added sweeteners in the diets of Americans. J Am Diet Assoc. 2000 Jan;100(1):43-51.
36 Stampher MJ. Vitamin and Minerals, What you need to know. Harvard Medical School. 2006.
37 Bouis HE. Enrichment of food staples through plant breeding: a new strategy for fighting micronutrient malnutrition. Nutrition. 2000 Jul-Aug;16(7-8):701-4. Review.
38 Combs GF. The vitamins, fundamental aspects in nutrition and health. Second Edition. San Diego: Academic Press; 1998. Pp. 469-79.
39 Conway JM, Rhodes DG, Rumpler WV. Commercial portion-controlled foods in research studies: how accurate are label weights? J Am Diet Assoc. 2004 Sep;104(9):1420-4.
40 Hathock JN. Vitamins and minerals: efficacy and safety. Am J Clin Nutr 1997 Aug; 66(2):427-37.
41 Hathock JN. Vitamins and mineral Safety. 2nd Edition. Council for Responsible Nutrition. 2004.
42 Clark LC, Combs GF Jr., Turnbull BW. The nutritional prevention of cancer with selenium 1983-1993; a randomized clinical trial. FASEB J 1996;10:A550 (abstr).
43 Liebman B, Schardt D. The multivitamin maze. Nutrition Action Newsletter: Center for Science in Public Interest (CSPI) 2006 March 33(2):6-10.
44 Fairfield KM, Fletcher RH. Vitamins for chronic disease prevention in adults: scientific review. JAMA. 2002 Jun 19;287(23):3116-26. Review. Erratum in: JAMA 2002 Oct 9;288(14):1720.
45 Barrett J. What the Nutrition Experts Take Every Day. Five experts talk about what they take and offer tips for getting the vitamins and nutrients you need. Newsweek. January 16, 2006.
46 Dollahite J, Franklin D, McNew R. Problems encountered in meeting the Recommended Dietary Allowances for menus designed according to the Dietary Guidelines for Americans. J Am Diet Assoc 1995 Mar;95(3):341-4, 347.
47 JD Wright, MPH, J Kennedy-Stephenson, MS, CY Wang, PhD, MA McDowell, MPH, CL Johnson, MSPH. Trends in Intake of Energy and Macronutrients ---United States, 1971—2000. National Center for Health Statistics, CDC. February 6, 2004 / 53(04);80-82
48 Ames BN. Low micronutrient intake may accelerate the degenerative diseases of aging through allocation of scarce micronutrients by triage. Proc Natl Acad Sci U S A. 2006 Nov 21;103(47):17589-94. Epub 2006 Nov 13. Review.
49 Chandra RK. Effect of vitamin and trace-element supplementation on immune responses and infection in elderly subjects. Lancet 1992 Nov 7;340(8828):1124-7.
50 Russell RM. New views on the RDAs for older adults. J Am Diet Assoc 1997 May;97(5):515-8.
51 Linus Pauling Institute. Micronutrient Research for Optimum Health. Oregon State University. http://lpi.oregonstate.edu/infocenter/vitamins/VitaminC/index.html. Accessed 09/08/2006.
52 Atalay M, Lappalainen J, Sen CK. Dietary antioxidants for the athlete. Curr Sports Med Rep. 2006 Jun;5(4):182-6. Review.
53 Rimm EB, Willett WC, Hu FB, Sampson L, Colditz GA, Manson JE, Hennekens C, Stampfer MJ. Folate and vitamin B6 from diet and supplements in relation to risk of coronary heart disease among women. JAMA 1998 February 4;279(5):359-364.
54 Woodside JV, Yarnell JWG, McMaster D, Young IS, Harmon DL, McCrum EE, Patterson CC, Gey KF, Whitehead AS, Evans A. Effect of B-group vitamins and antioxidant vitamins on hyperhomocysteinemia: a double-blind, randomized, factorial-design, controlled trial 1-3. Am J Clin Nutr 1998;67:858-66.
55 Moore CE, Murphy MM, Holick MF. Vitamin D intakes by children and adults in the United States differ among ethnic groups. J Nutr. 2005 Oct;135(10):2478-85.
56 Chernoff R. Micronutrient requirements in older women. Am J Clin Nutr. 2005 May;81(5):1240S-1245S. Review.
57 Gennari C. Calcium and vitamin D nutrition and bone disease of the elderly. Public Health Nutr. 2001 Apr;4(2B):547-59. Review.
58 Sherwood KL, Houghton LA, Tarasuk V, O'connor DL. One-third of pregnant and lactating women may not be meeting their folate requirements from diet alone based on mandated levels of folic Acid fortification. J Nutr. 2006 Nov;136(11):2820-6.

59 Bischoff-Ferrari HA, Willett WC, Wong JB, Giovannucci E, Dietrich T, Dawson-Hughes B. Fracture

prevention with vitamin D supplementation: a meta-analysis of randomized controlled trials. JAMA. 2005 May 11;293(18):2257-64. Review.
60 Holick MF. The vitamin D epidemic and its health consequences. J Nutr. 2005 Nov;135(11):2739S-48S.
61 Grant WB, Holick MF. Benefits and requirements of vitamin D for optimal health: a review. Altern Med Rev. 2005 Jun;10(2):94-111. Review.
62 Frank B, Gupta S. A review of antioxidants and Alzheimer's disease. Ann Clin Psychiatry. 2005 Oct-Dec;17(4):269-86. Review.
63 Hollis BW. Circulating 25-hydroxyvitamin D levels indicative of vitamin D sufficiency: implications for establishing a new effective dietary intake recommendation for vitamin D. J Nutr. 2005 Feb;135(2):317-22. Review.
64 Palacios C. The role of nutrients in bone health, from a to z. Crit Rev Food Sci Nutr. 2006;46(8):621-8.
65 Morton DJ, Barrett-Connor EL, Schneider DL. Vitamin C supplement use and bone mineral density in postmenopausal women. J Bone Miner Res. 2001 Jan;16(1):135-40.
66 Kantoff P. Prevention, complementary therapies, and new scientific developments in the field of prostate cancer. Rev Urol. 2006;8 Suppl 2:S9-S14.
67 Dunn-Emke SR, Weidner G, Pettengill EB, Marlin RO, Chi C, Ornish DM. Nutrient adequacy of a very low-fat vegan diet. J Am Diet Assoc. 2005 Sep;105(9):1442-6.
68 Volpe SL. Micronutrient requirements for athletes. Clin Sports Med. 2007 Jan;26(1):119-30. Review.
69 Group breaks precedent [National Academy of Sciences], recommends vitamins. The Washington Post 1998 April 8; Sect A:14.
70 Schoenthaler SJ, Bier ID, Young K, Nichols D, Jansenns S. The effect of vitamin-mineral supplementation on the intelligence of American schoolchildren: a randomized, double-blind placebo-controlled trial. J Altern Complement Med. 2000 Feb;6(1):19-29.
71 Liebman B, Schardt D. Vitamin smarts. Nutrition Action Newsletter: Center for Science in Public Interest (CSPI) 1995 November 22(9):1,6-10.
72 Holick MF. The vitamin D epidemic and its health consequences. J Nutr. 2005 Nov;135(11):2739S-48S.
73 Grant WB, Holick MF. Benefits and requirements of vitamin D for optimal health: a review. Altern Med Rev. 2005 Jun;10(2):94-111. Review.
74 Frank B, Gupta S. A review of antioxidants and Alzheimer's disease. Ann Clin Psychiatry. 2005 Oct-Dec;17(4):269-86. Review.
75 Hollis BW. Circulating 25-hydroxyvitamin D levels indicative of vitamin D sufficiency: implications for establishing a new effective dietary intake recommendation for vitamin D. J Nutr. 2005 Feb;135(2):317-22. Review.
76 Morton DJ, Barrett-Connor EL, Schneider DL. Vitamin C supplement use and bone mineral density in postmenopausal women. J Bone Miner Res. 2001 Jan;16(1):135-40.
77 Kantoff P. Prevention, complementary therapies, and new scientific developments in the field of prostate cancer. Rev Urol. 2006;8 Suppl 2:S9-S14.
78 Kennedy ET. Evidence for nutritional benefits in prolonging wellness. Am J Clin Nutr. 2006 Feb;83(2):410S-414S. Review.
79 Yates AA. National nutrition and public health policies: issues related to bioavailability of nutrients when developing dietary reference intakes. J Nutr. 2001 Apr;131(4 Suppl):1331S-4S.
80 Yates AA. Dietary reference intakes: concepts and approaches underlying protein and energy requirements. Nestle Nutr Workshop Ser Pediatr Program. 2006;(58):79-90; discussion 90-4. Review.
81 Blackburn GL, Jensen GL. Improvement of coronary artery disease in a patient with hyperhomocysteinemia: report of a case. Nutrition 1998;14.
82 Cheng CH, Lin PT, Liaw YP, Ho CC, Tsai TP, Chou MC, Huang YC. Plasma pyridoxal 5'-phosphate and high-sensitivity C-reactive protein are independently associated with an increased risk of coronary artery disease. Nutrition. 2008 Mar;24(3):239-44.
83 Akabas SR, Deckelbaum RJ. N-3 Fatty acids: Recommendations for Theraeutics and Prevention. Am J Clin Nutr. 2006 Jun;83(6 Suppl):1451S-1538S.
84 Schauss AG. Minerals, trace elements and human health. Library of Congress Cataloging-in-Publication Data.
85 Combs GF. The vitamins, fundamental aspects in nutrition and health. Second Edition. San Diego: Academic Press; 1998. Pp. 522-529.
86 Combs GF. The vitamins, fundamental aspects in nutrition and health. Second Edition. San Diego: Academic Press; 1998. Pp. 537-548.

Appendix 2
Three proven strategies for weight reduction, maintenance of weight loss and prevention of weight gain

Dieting to lose weight is difficult at best, and generally ends in frustration for the average person. The majority of people gain most of the weight back within the first year.[1,2]

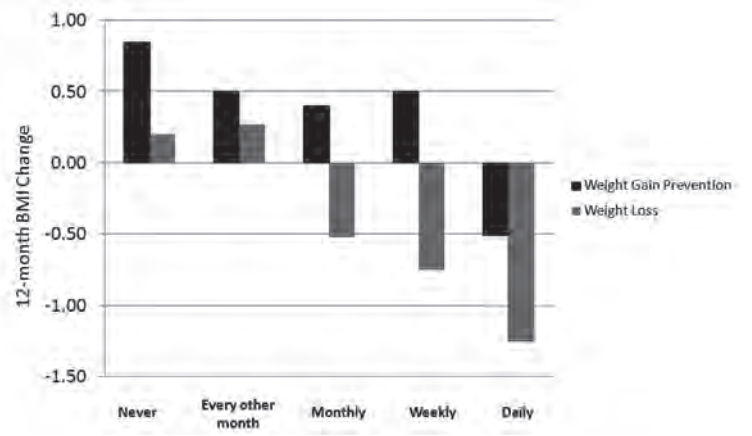
However, there are three strategies that have consistently proven to be effective in losing weight and maintaining the loss. When combining all three, a person may have the greatest chance of succeeding in accomplishing their desired weight loss (when compared to all current conventional methods of weight loss). When incorporating the three simple methods shown below during caloric restriction, the dieter should significantly reduce the overall effort generally associated with dieting. This allows the participant to more comfortably achieve and maintain the desired outcome.

1. Self-weigh as often as possible and chart your progress

All studies investigating self-weighing as a weight control strategy have demonstrated that the more you weigh yourself the greater the weight loss,[3] maintenance of the loss and prevention of weight gain.[3,4,5,6] Research also validated the reverse: the less frequently subjects weighed in, the lower their chance of success, and those who checked their weight the least or never gained weight.[3] Presumably by the time they would weigh themselves, if ever, it was too late to undo the damage without a significant lifestyle change, hence they continued to gain weight.

Figure 2 captures the significant results of regular weighing. More significant is the fact that as time went on the subjects who consistently weighed themselves continued to reduce their body mass index (BMI). This is completely opposite today's norm.[3]

Subjects weighing multiple times a week reported that any time weight was not trending in a desired direction they would make a simple adjustment. Sometimes eating slightly less (including skipping a meal) or an alteration in exercise would allow them to maintain an easy, steady course to the goal. Additionally, the fact that one has to weigh each day (or most days) influences people to "think twice" about consuming something that might give them an undesirable weigh in.



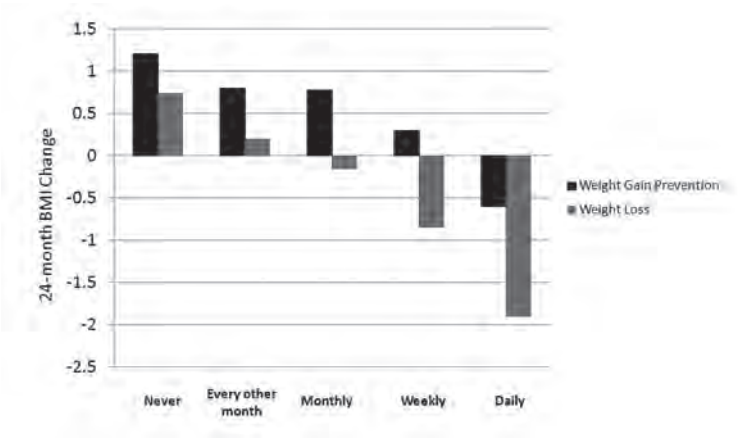


Figure 2: Shows the results of weighing frequency: the dark bars were subjects attempting weight loss. The white bars were subjects attempting to prevent weight gain. These amazing results clearly demonstrate the effectiveness of regular weighing. Linde JA, Jeffery RW, French SA, Pronk NP, Boyle RG. Self-weighing in weight gain prevention and weight loss trials. Ann Behav M ed. 2005 Dec;30(3):210-6.

2. Use of pharmacological agents (prescription drugs) to assist weight loss

The goal of incorporating a dietary supplement or drug into a weight loss program is to assist the participant in complying with the conditions necessary for weight reduction.

In 19 studies, participants using weight loss drugs that prevent dietary fat/ calorie absorption and speed metabolism significantly increased total weight loss combined with a dietary/lifestyle regime than when compared to subjects using the dietary/lifestyle regime and placebo.[8] The treatment groups were, on average, three times more likely to lose more than five percent of their total body weight and four times more likely to maintain the weight loss after two years.

The problem with drug therapy is that prescription weight loss drugs should not be used for extended periods of time because they bring along known side effects. Therefore, the goal would be to find safe, natural alternatives in dietary supplements that have the same basic actions (increase calorie burning and block unneeded calories), thus potential to assist in weight loss.[9,10,11,12,13,14,15,16,17,18,19,20,21,22] The dieter would cease supplementation once the weight goal is reached or when they have their daily routines under control to continue making progress without the supplements.

3. Incorporating meal replacements into daily diet

In all studies, meal replacements (MR) have been shown to be an extremely effective aid to weight reduction[23] and in almost all cases more effective than conventional methods of dietary restrictions.[24,25,26,27] Additionally, meal replacements have been shown to be just as effective as dietary restriction combined with pharmacological therapy.[8] And most importantly, continuous use of meal replacements may be the most effective means of all treatments when it comes to maintaining weight loss[1,28,29,30] (see figure 3).

Meal replacements are generally used to replace one or two meals a day and allow the individual complete freedom for their remaining daily calories.

Meal replacements allow

- Portion control: people generally attempt to consume meals to completion;[31,32] therefore, meal portion size significantly impacts a person's total calorie intake.[17,33] Overwhelming evidence validates that the smaller the portions, the fewer daily calories consumed[19] and vice-versa – i.e. people tend to "eat with their eyes not their stomachs". Use of portion controlled meals has proven to yield

greater weight loss than conventional diet therapy alone.[34,35,36,37]

- Accurate calorie counts of total daily food intake when compared to having to estimate the calories of self-prepared or unmarked meals.[38]

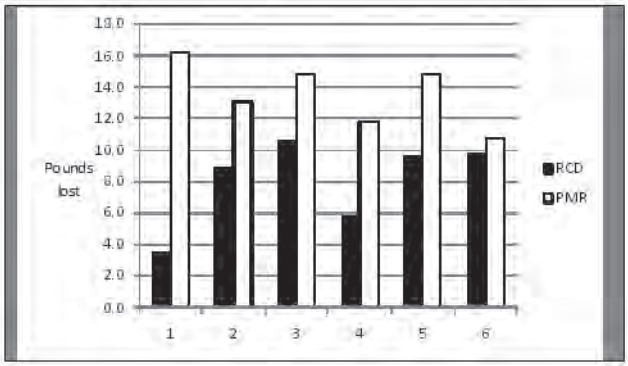


Figure 3: In all six studies the groups using meal replacements (PMR) as part of their overall calorie intake lost significantly more weight than subjects using the reduced calorie diet (RCD) alone. Heymsfield SB (2003)

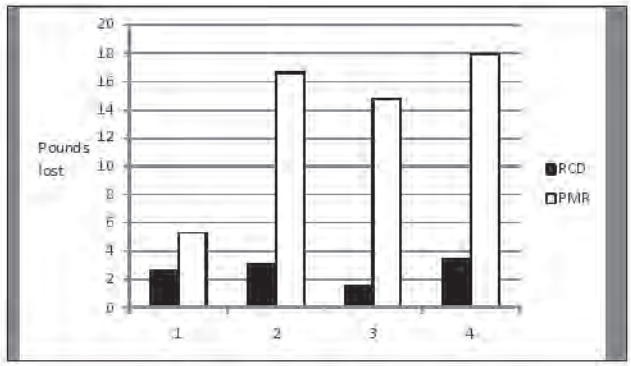


Figure 4: In a 1-year follow-up in the groups that were tracked, the subjects still using meal replacements maintained significantly more weight loss than the RCD group. Heymsfield SB (2003)

References

1 McGuire MT, Wing RR, Klem ML, Lang W, Hill JO. What predicts weight regain in a group of successful weight losers? J Consult Clin Psychol 1999;67:177–85.
2 Phelan S, Hill JO, Lang W, Dibello JR, Wing RR. Recovery from relapse among successful weight maintainers. Am J Clin Nutr. 2003 Dec;78(6):1079-84.
3 Linde JA, Jeffery RW, French SA, Pronk NP, Boyle RG. Self-weighing in weight gain prevention and weight loss trials. Ann Behav M ed. 2005 Dec;30(3):210-6.
4 Fujimoto K, Sakata T, Etou H, Fukagawa K, Ookuma K, Terada K, Kurata K. Charting of daily weight pattern reinforces maintenance of weight reduction in moderately obese patients. Am J Med Sci. 1992 Mar;303(3):145-50.
5 Klem ML, Wing RR, McGuire MT, Seagle HM, Hill JO. descriptive study of individuals successful at long-term maintenance of substantial weight loss. Am J Clin Nutr. 1997 Aug;66(2):239-46.
6 Wing RR, Tate DF, Gorin AA, Raynor HA, Fava JL. A self-regulation program for maintenance of weight loss. N Engl J Med. 2006 Oct 12;355(15):1563-71.
7 Levitsky DA, Garay J, Nausbaum M, Neighbors L, Dellavalle DM. Monitoring weight daily blocks the freshman weight gain: a model for combating the epidemic of obesity. Int J Obes (Lond). 2006 Jun;30(6):1003-10
8 Douketis JD, Macie C, Thabane L, Williamson DF. Systematic review of long-term weight loss stud-

ies in obese adults: clinical significance and applicability to clinical practice. Int J Obes (Lond). 2005 Oct;29(10):1153-67. Review.
9 Zheng G, Sayama K, Okubo T, Juneja LR, Oguni I. Anti-obesity effects of three major components of green tea, catechins, caffeine and theanine, in mice. In Vivo. 2004 Jan-Feb;18(1):55-62.
10 Abidov MT, Grachev SV, Klimenov AL, Kalyuzhin OV. The effects of Aralox, a phytomedicine, consisting of standardized extracts of Aralia mandshurica (Araliaceae) and Engelhardtia chrysolepis (Juglandaceae), on body fat loss, lipolytic activity and adipocytes perilipins, in obese, non-diabetic women on a restricted calorie diet is investigated in a double-blind, randomized, placebo-controlled clinical trial. Remedium Medical Journal, Russian Academy of Sciences 2005:35-47.
11 Tappenden KA, Martin A, Layman DK, Baum J. Evaluation of the efficacy of an amylase inhibitor. FASEB 2001; 15(4):A301.
12 Vinson JA, Shuta DM. In vivo effectiveness of a starch absorption blocker in a double-blind placebo-controlled study with normal college-age subjects. 2001. unpublished. http://www.starchstopper.com/study3.html.
13 Vinson JA, Shuta DM, Al Kharrat H. In vivo effectiveness of a starch absorption blocker in a double-blind placebo-controlled study with normal subjects. 2001. unpublished. http://www.starchstopper.com/study6.html.
14 Vinson JA, Al Kharrat H. In Vivo Effectiveness of a Starch Absorption Blocker in a Double-Blind Placebo-Controlled Study with Normal Subjects. 2003. unpublished. http://www.starchstopper.com/study_vivoeffect.html.
15 Vinson JA. Investigation of the efficacy of Phase 2® , a purified bean extract from Pharmachem Laboratories. 2001. unpublished. http://www.starchstopper.com/study1.html
16 Anonymous. Starch Neutralizer Promotes Weight Loss, Lowers Triglyceride Levels. http://www.starchstopper.com/study_dec1002.html
17 Thom E. A randomized, double-blind, placebo-controlled trial of a new weight-reducing agent of natural origin. J Int Med Res 2000; 28:229-33.
18 Dulloo AG, Geissler CA, Horton T, Collins A, Miller DS. Normal caffeine consumption: influence on thermogenesis and daily energy expenditure in lean and postobese human volunteers. Am J Clin Nutr. 1989 Jan;49(1):44-50.
19 Bérubé-Parent S, Pelletier C, Doré J, Tremblay A. Effects of encapsulated green tea and Guarana extracts containing a mixture of epigallocatechin-3-gallate and caffeine on 24 h energy expenditure and fat oxidation in men. Br J Nutr. 2005 Sep;94(3):432-6.
20 Koot P, Deurenberg P. Comparison of changes in energy expenditure and body temperatures after caffeine consumption. Ann Nutr Metab. 1995;39(3):135-42.
21 Diepvens K, Westerterp KR, Westerterp-Plantenga MS. Obesity and thermogenesis related to the consumption of caffeine, ephedrine, capsaicin and green tea. Am J Physiol Regul Integr Comp Physiol. 2006 Jul 13; [Epub ahead of print]
22 Bracco D, Ferrarra JM, Arnaud MJ, Jequier E, Schutz Y. Effects of caffeine on energy metabolism, heart rate, and methylxanthine metabolism in lean and obese women. Am J Physiol. 1995 Oct;269(4 Pt 1):E671-8.
23 Heymsfield SB, van Mierlo CA, van der Knaap HC, Heo M, Frier HI. Weight management using a meal replacement strategy: meta and pooling analysis from six studies. Int J Obes Relat Metab Disord. 2003 May;27(5):537-49.
24 Ashley JM, St Jeor ST, Perumean-Chaney S, Schrage J, Bovee V. Meal replacements in weight intervention. Obes Res. 2001 Nov;9 Suppl 4:312S-320S.
25 Ditschuneit HH. Do meal replacement drinks have a role in diabetes management? Nestle Nutr Workshop Ser Clin Perform Programme. 2006;11:171-9; discussion 179-81. Review.
26 Li Z, Hong K, Saltsman P, DeShields S, Bellman M, Thames G, Liu Y, Wang HJ, Elashoff R, Heber D. Long-term efficacy of soybased meal replacements vs an individualized diet plan in obese type II DM patients: relative effects on weight loss, metabolic parameters, and C-reactive protein. Eur J Clin Nutr. 2005 Mar;59(3):411-8.
27 Poston WS, Haddock CK, Pinkston MM, Pace P, Karakoc ND, Reeves RS, Foreyt JP. Weight loss with meal replacement and meal replacement plus snacks: a randomized trial. Int J Obes (Lond). 2005 Sep;29(9):1107-14.
28 Ditschuneit HH, Flechtner-Mors M. Value of structured meals for weight management: risk factors and long-term weight maintenance. Obes Res. 2001 Nov;9 Suppl 4:284S-289S.
29 Rothacker DQ. Five-year self-management of weight using meal replacements: comparison with matched controls in rural Wisconsin. Nutrition 2000;16:344–8.

30 Flechtner-Mors M, Ditschuneit HH, Johnson TD, Suchard MA, Adler G. Metabolic and weight loss effects of long-term dietary intervention in obese patients: four-year results. Obes Res. 2000 Aug;8(5):399-402.
31 Levitsky DA, Youn T. The more food young adults are served, the more they overeat. J Nutr. 2004 Oct;134(10):2546-9.
32 Wansink B, Painter JE, North J. Bottomless bowls: why visual cues of portion size may influence intake. Obes Res. 2005 Jan;13(1):93-100.
33 Rolls BJ, Roe LS, Meengs JS. Reductions in portion size and energy density of foods are additive and lead to sustained decreases in energy intake. Am J Clin Nutr. 2006 Jan;83(1):11-7.
34 Jeffery RW, Wing RR, Thorson C, Burton LR, Raether C, Harvey J, Mullen M. Strengthening behavioral interventions for weight loss: a randomized trial of food provision and monetary incentives. J Consult Clin Psychol. 1993 Dec;61(6):1038-45
35 McCarron DA, Oparil S, Chait A, Haynes RB, Kris-Etherton P, Stern JS, Resnick LM, Clark S, Morris CD, Hatton DC, Metz JA, McMahon M, Holcomb S, Snyder GW, Pi-Sunyer FX. Nutritional management of cardiovascular risk factors. A randomized clinical trial. Arch Intern Med. 1997 Jan 27;157(2):169-77.
36 Wing RR, Jeffery RW. Food provision as a strategy to promote weight loss. Obes Res. 2001 Nov;9 Suppl 4:271S-275S. Review.
37 Wing RR, Jeffery RW, Burton LR, Thorson C, Nissinoff KS, Baxter JE. Food provision vs structured meal plans in the behavioral treatment of obesity. Int J Obes Relat Metab Disord. 1996 Jan;20(1):56-62.
38 Abbot JM, Thomson CA, Ranger-Moore J, Teixeira PJ, Lohman TG, Taren DL, Cussler E, Going SB, Houtkooper LB. Psychosocial and behavioral profile and predictors of self-reported energy underreporting in obese middle-aged women. J Am Diet Assoc. 2008 Jan;108(1):114-9.

Appendix 3
Xtreme Muscle Stack: Creating the Perfect Anabolic Storm

These diet and supplement manipulations create the greatest muscle size and performance gains while reducing body fat.

For those who strictly want the "keys to the kingdom of muscle ", go straight to the formulas starting at the end of this article. For those interested in understanding how and why, start here.

Many years ago, it was a widely accepted belief that if one trained hard and focused on diet and supplementation, they could expect to put on ten pounds of muscle a year. If that rate of body change appeals to you, then no need to read any further. However, if you want to maximize your progress and take advantage of truly cutting edge information that has recently emerged, and if you want to break through plateaus, optimize recovery and accelerate muscle gains (with or without body fat loss) then read on. The following article will feed your mind and teach you how to feed your body, allowing you to make gains you dreamed of but never thought possible.

Daily exercise-induced changes in muscle occur at an imperceptible rate (a pound of muscle every two weeks would yield 1.14 ounces a day). Measurable changes to skeletal muscle fibers (type and diameter) require repeated exposure to the stimulus of progressively more challenging exercise over a significant period of time (six to eight weeks).[1,2,3] Surprisingly, recent research has confirmed that it is the immediate post-exercise period when the greatest changes in muscle protein synthesis and tissue structure occurs, making this a critical aspect in the building process.[4,5,6]

Muscle protein synthesis can be stimulated in many ways and the various mechanisms may interact and have additive effects. The secret to naturally achieving one's full potential for muscle size and strength, without gaining unwanted body fat (or better yet, gain size while losing body fat) requires the following: Matching the proper training with a food and dietary supplement plan that optimizes one's internal physiological environment. The areas that can be manipulated and optimized to ensure ideal recovery and growth include:

- Dietary factors such as the amount and proper timing of calories, protein, carbohydrate and fat (the macronutrients)
- Specific dietary supplements such as the amino acid (AA) leucine, glutamine, specific AA mixtures and creatine provided to muscle cells at ideal times
- Exercise type and amount
- Hormonal environment (especially insulin modulation)
- Cell volume changes and vasodilatation can enhance an anabolic environment and maximize the flow of nutrients into, and waste products, out of muscle

All of these elements may contribute independently and/or synergistically to muscle protein synthesis and related adaptations to training. In the following text we focus on the above manipulations, minus exercise, that can be employed to maximize the internal hormonal, nutrient, recovery and protein synthesis environment of the body.

Diet and Insulin

Proper diet manipulations can dramatically and positively affect the muscle building hormone production. Accomplishing the proper hormone balance for muscle building, without increasing body fat, is a function of carbohydrates, proteins and fats being supplied in proper ratios, forms and at specific times. This is in relation to training periods while remaining within the caloric allotment necessary for the body composition goal. Using diet to harness the body's most powerful muscle building hormone, insulin, will reduce muscle catabolism (breakdown) and increase muscle anabolism (buildup), leading to maximum net increases in muscle synthesis.

Manipulated insulin to maximize muscle building

In addition to stimulating muscle protein synthesis, insulin also plays a major role in minimizing the damage caused by exercise. Strength training triggers the release of the catabolic hormones cortisol and

epinephrine, which work to breakdown glycogen (stored carbohydrate that fuels muscle action) and muscle proteins to supply energy and produce work. However, this process also leads to muscle damage. Although you need to be able to train hard enough to stimulate growth, if you can minimize the tissue damage during and after exercise, your body will spend more time and incoming nutrients building new muscle rather than constantly repairing it, allowing you to avoid training plateaus. In other words, the goal is to add new muscle, not just repair the old.

Metabolic windows

We now know there are certain times, primarily immediately post-workout, when muscle building is at its peak and we refer to these times as "metabolic windows". This is a short period of time (60-90 minutes) when muscle cells become highly receptive to the incoming nutrients responsible for muscle building; therefore, if there are no or low nutrients, there's low or no muscle building. Insulin is the hormone that starts the cascade of muscle-building events during these short specific periods. By stimulating insulin at specific times with the proper carbohydrate and protein intake before (in order to help blunt cortisol thus muscle breakdown), during and after exercise, you can significantly enhance and accelerate muscle building (anabolism).[7] Through simple but accurate dietary management, we can unlock all of insulin's many muscle-building properties in order to turn on and keep running all of the body's "muscle building machinery".

Summary: by managing insulin through proper carbohydrate and protein intake at all meal times (see Table 1), one can maximize the "metabolic windows" of muscle building. Insulin positively affects other anabolic hormones (testosterone, IGF-1, etc.) while blunting catabolic (cortisol) hormones creating a perfect muscle building storm. And as long as we have the right nutrients and control of the insulin, we get bigger, faster and/or stronger from every workout – read on.

Metabolic windows of growth

Immediately following exercise, muscle cell nutrient uptake is at its highest point of the day and therefore this small "window of opportunity" requires a well designed, fast- acting formula (8) to satisfy the muscle's exercise-induced demands.

Numerous studies have demonstrated that the inclusion of "immediate" pre- & post- training, fast-acting carbohydrate/sugars and protein feedings can stimulate muscle protein synthesis (MPS)[9,10] and reduce muscle damage to a far greater extent than normal feeding patterns.[11,12] In other words, no matter how well you eat throughout the day, you recover faster and build more muscle and strength by including these quickly absorbed pre and post exercise formulas (see figure 1).[13,14]

Food/diet composition

As stated above, carbohydrates will play an important role in your performance, recovery and insulin levels. While trying to increase muscle size, carbohydrates (CHO) should make up 45-60% of your total caloric intake. Without adequate CHO, ideal insulin activation will not occur, recovery from intense workouts will not be ideal, and muscular stores of energy for the next workout will be suboptimal. None of this contributes to maximum muscular gains. Protein, which mistakenly receives the greatest focus by many exercisers, needs to be high enough to allow for tissue growth. For even the hardest training bodybuilder when calories are not severely restricted*, a protein intake of up to 1 gram per pound of bodyweight is more than enough to allow for increased needs due to intense workouts and adding muscle. Higher protein intakes are not necessary and may even impede progress if it takes the place of dietary carbohydrate. Healthy fats will complete the picture, making up the remaining calories and generally supplying 15-30% of total caloric intake. To summarize:

- Calories: ideally total calorie intake should be slightly above needs so that the extra nutrients/calories would be deposited into muscle tissues, allowing one's body fat percentage to naturally "drift down" as weight goes up. If simultaneous body fat loss is desired, then the calorie deficit should be no greater than approx. 15% of calorie maintenance or maximum muscle building will be compromised
- Carbohydrates: approx. 45-60% of total caloric intake*
- Protein: approx. 15-30% of total caloric intake (max of 1g/lb of bodyweight)*
- Dietary fat: approx. 15-30% of total caloric intake

*The only time protein needs would be greater is during severe dieting as with physique athletes in the final weeks of contest preparation. During this deprivation period, although protein intake is extremely high and carbohydrates low because of the lower calorie allotment, muscle is at best maintained and generally lost (see side bar on protein and bodybuilders). This highlights the important role carbohydrates play in muscle building.

Pre- and post-exercise/activity energy and recovery supplementation

Because of the length of time it takes to digest and absorb the nutrients from traditional meals, whole/traditional food meals cannot deliver the required nutrients within a timeframe that allows maximum results induced by exercise. This is when compared to the proper use of quick digesting specialized formulas.(14, 15)

The proper pre-/post-workout formula

There is no longer a debate whether pre- and post-workout feedings enhance exercise-induced results. Volumes of peer review literature and studies continue to not only validate this now established fact, but also document the proper formula.[16,17,18]

The formulas used in scientific studies are all relatively the same: within the range of 1.5-4 parts carbohydrate (CHO) (made up of primarily glucose polymers) to 1 part protein and low to no fat. The CHO range is based on the activity being studied – the longer the workout the higher the carbohydrate/sugar content. This formula produces the desired results i.e. quick lasting energy, faster recovery and more muscle and strength gains from your workout.

Pre-workout feedings

Although recovery primarily takes place after the workout, you can help speed and enhance the process before you start exercise by ingesting the same formula 10-40 minutes before the workout (always make sure your pre-training full food meal is eaten 2-3 hours before exercise unless you train first thing in the morning and time does not permit). The pre-workout feeding is important because it stimulates insulin production. Remember, insulin is our body's most anabolic hormone thus "king" when it comes to building muscle.[7,19,20] As mentioned, not only does this hormone start and continue the entire muscle-building process, but insulin also helps minimize the damage caused by exercise[7,19,20] by blunting the exercise-induced production of the catabolic hormones. These hormones "tear down" muscle tissue.[7,19]

Post-workout feeding

The proper formula should be ingested as close to immediately after training as possible. Very recently it was discovered that although the post-training metabolic window is active for as much as 60-90 minutes, its maximum activity (greatest nutrient uptake and protein synthesis capabilities) takes place immediately at the end of the training session.[14] From that point on, the longer you wait to supply the proper nutrients or the more time they take to get to the affected tissues, the less muscle building or recovery takes place during this period and can't be made up for at any other point in time (see figure 5). Simply put, the post-workout feeding activates the muscle building mechanisms that take place in this window of opportunity.

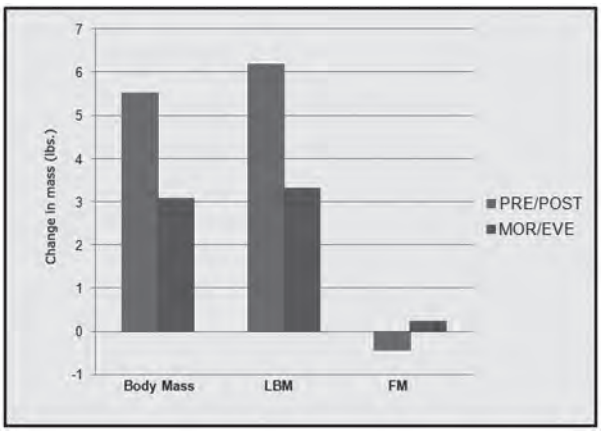


Figure 5: Training results from 23 experienced recreational bodybuilders resistance training for 10 weeks with all things (diet, supplements, training, etc.) equal except the addition of pre/post feedings yielded significantly greater gains in body mass, LBM, strength and reduction in fat mass for the pre/post feeding subjects.[14]

Summary

By ingesting the proper exercise formula before training, you not only supply workout energy but also kick off the necessary insulin/hormone release that will work to mitigate exercise-induced damage. When you repeat the process immediately post-workout, you quickly restore energy (glycogen), supply muscle building nutrients when most needed, and stimulate a renewed insulin release. This initiates and enhances the entire muscle-building hormone process/cascade, thus recovery and results.

Protein and the Bodybuilder

When bodybuilders are in the off-season energy balance phase, they should follow the same protein recommendations as strength athletes.[21] However, during negative energy balance en route to competition-level body fat, protein requirements may dramatically increase.
To reach competitive levels of body fat, calorie intake is continually lowered while exercise—including cardiorespiratory, weight training and posing—is increased. (Competitive levels of body fat are generally unhealthy and impossible to maintain for prolonged periods.)

Each component of this regime may have additive effects on protein requirements. The body's survival mechanisms, related to energy expenditure in excess of energy intake, are probably highly active during this period, forcing a continued reduction in food intake to achieve the goal.[22,23] However, due to anabolic requirements, protein intake cannot be lowered. In fact, protein intake may have to be increased in the final few weeks before competition.

During this period, the body is torn between the use of food components for energy expenditure and the support of muscle tissue. The athlete is forcing the body to achieve abnormally low levels of body fat for competition. When overall energy intake is significantly less than energy expenditure, the hormonal milieu dictates the breakdown of muscle protein for energy supply. When carbohydrate availability is limited, this effect is even more pronounced. Thus, it can be quite a challenge to balance these drastic measures with an appropriate mix of protein and carbohydrate intake. This highlights the importance of the use of dietary supplements for staving off the loss of lean body mass while low body fat is a primary goal.

Dietary supplements

The final component to maximizing size and performance gains is the integration of dietary supplements. To keep calories within an appropriate range that does not contribute to unwanted fat stores, the primary goal of incorporating dietary supplements into food planning is to supply specific compounds that are used during energy, force production (muscle exertion and subsequent damage) and are needed for recovery/building. Additionally, these specific compounds must be supplied in greater amounts than are used so that a portion of their intake will be deposited into the damaged or depleted structural tissues. This will lead to the desired increase in muscle size.

By isolating these nutrients/compounds from the food form, we can supply them without the calories in order to control body composition. And because they're manufactured in proper forms, dosing dietary supplements allows the user to deliver the needed nutrients into the body at the exact times necessary to take full dvantage of periods when muscle cells are most nutrient-sensitive. This is established by training, sleep and meal times.

So, there you have the facts - and below you have the general recipe to create the "perfect muscle building storm".

Optimal dotFIT Anabolic Diet & Supplement Program: The Xtreme Muscle Stack
Menu plan and eating instructions

Below is a sample Performance & Muscle Building Menu and eating instructions for a 180 LBS athlete (get complete sets of personalized plans from our online program).

Arrange your meals around your activities
Although the meals will appear in a breakfast, lunch and dinner fashion, you must arrange the meals around your training session(s). Space your meals no more than 3-4 hours apart. Other than your pre-event meal and pre- and post- snacks, you may eat the remaining meals in any order that fits your lifestyle or venue.

Early morning training
If you train soon after rising and have no time for complete digestion of a large meal, make sure you consume your pre-training meal (or something very similar) as your final meal of the day, as late as possible, and consume only the pre-workout snack before your early morning workout.

Pre and post training feedings
The pre/post feedings or snacks will usually be shown in a liquid form, but you may substitute based on preference, venue and/or convenience, any of the appropriate dotFIT foods. In other words, you may choose a bar as the pre-workout portion and a shake post-workout or vice-versa.

Performance Menu – 3500 Calories				
Meal 1 – Morning Snack Eat this meal as soon as you wake up.	Pro (g)	Carb (g)	Fat (g)	Calories
1 dotFIT Breakfast Bar	15	29	5	220
1 cup (8 oz) Orange Juice	2	26	-	110
Total:	17	55	5	330
Percent of Calories:	20%	66%	14%	
Meal 2 – Pre Training Meal Eat this meal 2 ½ to 3 hours before workouts or competition.	Pro (g)	Carb (g)	Fat (g)	Calories
1 (3.7 oz) Honey Whole Wheat Bagel	11	64	1	300
2 tbsp Smooth Peanut Butter	8	6	16	188
1 medium Banana	1	27	0.4	105
1.5 cup (12 oz) Skim Milk	13	19	0.9	136
1 each dotFIT ActiveMV Multivitamin	-	-	-	-
Total:	33	116	18	729
Percent of Calories:	18%	61%	21%	
Meal 3 – Pre Training Snack (dotFIT Shake, Any Recipe) Eat this snack 10 to 40 minutes before workouts to maximize energy stores.	Pro (g)	Carb (g)	Fat (g)	Calories
2 scoops dotFIT Pre/Post & Meal Replacement Formula, Vanilla	20	35	3	240
1 cup Frozen Mixed Berries	-	17	-	70
Crushed Ice	-	-	-	
Total:	20	52	3	310
Percent of Calories:	25%	66%	9%	
Meal 4 – Post Training Snack (dotFIT Shake, Any Recipe) Eat or drink this snack immediately after workouts to refill energy stores and enhance recovery.	Pro (g)	Carb (g)	Fat (g)	Calories
2 scoops dotFIT Pre/Post & Meal Replacement Formula, Chocolate	20	35	3	240
1.5 (12 oz) Skim Milk	13	19	0.9	136
Total:	33	54	4	376
Percent of Calories:	35%	56%	9%	
Meal 4 – Post-training Meal Eat this meal within 1.5 hours after workouts	Pro (g)	Carb (g)	Fat (g)	Calories
1 Subway Footlong Turkey Sandwich	37	92	9	560
1 bottle (20 oz) Gatorade	-	35	-	130
1 dotFIT SuperiorAntioxidant	-	-	-	-
Total:	37	127	9	683
Percent of Calories:	24%	62%	14%	
Menu Totals:	211	537	68	3510
Percentage of Total Calories:	23%	60%	17%	

Other Nutrients:	7% Saturated Fat	304 mg Cholesterol	34 g Fiber

Follow your pre- & post-workout feedings as described in the above menu plan, use a multivitamin and mineral formula daily, and include the following recommendations:

- dotFIT CreatineXXL™ (click here for product information video)
  - A supercharged creatine formula to improve upon the well-known size and performance enhancing effects of creatine-monohydrate. Designed to deliver increased strength-endurance, intensity (beta-Alanine) and much greater cell volume effects (glycine and glutamine) than creatine alone, all leading to greater strength, size and performance gains
- NO7RAGE™ (click here for product information video)
  - Contains a blend of compounds that increase muscle blood flow, cell volume ("the pump") and mental focus. Greater blood flow to muscles increases the delivery of oxygen, energy and rebuilding nutrients as well as speeding up the removal of waste products. This leads to improved strength, less muscle breakdown and increased muscle size and performance
  - Contains creatine, caffeine, etc.
- AminoBoostXXL™
  - This product has the ideal mix of essential amino acids shown to enhance muscle gain and recovery
  - Delivers the ideal blend of nutrients to take advantage of post-training "metabolic windows of growth" adding to the muscle building results produced by the pre- and post-exercise feedings. The unique blend of AA are quickly assimilated into muscle tissues

Directions for Use

Table 3: Maximal Protein Synthesis Periodization

Week	NO7Rage	AminoBoostXXL	CreatineXXL	Training Intensity
1	1-2.5 scoops as directed 30 min before WO			Med
2	1-2.5 scoops as directed 30 min before WO			Med-High
3	1-2.5 scoops as directed 30 min before WO			High
4	1-2.5 scoops as directed 30 min before WO	½ - 1 scoop as directed 30 min before & immediately post WO*		High
5	1-2.5 scoops as directed 30 min before WO	½ - 1 scoop as directed 30 min before & immediately post WO*		High
6	1-2.5 scoops as directed 30 min before WO	½ - 1 scoop as directed 30 min before & immediately post WO*		High
7	1-2.5 scoops as directed 30 min before WO	½ - 1 scoop as directed 30 min before & immediately post WO*	10 caps, 5 after WO, split remaining throughout day with meals	High
8	1-2.5 scoops as directed 30 min before WO	½ - 1 scoop as directed 30 min before & immediately post WO*	12 caps, 5 after WO, split remaining throughout day with meals	High
9	1-2.5 scoops as directed 30 min before WO	½ - 1 scoop as directed 30 min before & immediately post WO*	14 caps, 5 after WO, split remaining throughout day with meals	High
10	1-2.5 scoops as directed 30 min before WO	½ - 1 scoop as directed 30 min before & immediately post WO*	16 caps, 5 after WO, split remaining throughout day with meals	High
11	1-2.5 scoops as directed 30 min before WO	½ - 1 scoop as directed 30 min before & immediately post WO*	16 caps, 5 after WO, split remaining throughout day with meals	High
12	1-2.5 scoops as directed 30 min before WO	½ - 1 scoop as directed 30 min before & immediately post WO*	14 caps, 5 after WO, split remaining throughout day with meals	Competition Week
13		½ - 1 scoop as directed 30 min before & immediately post WO*	10 caps, 5 after WO, split remaining throughout day with meals	Low/Med or Active rest
14	0	0	0	Off
15	0	0	0	Off
16	0	0	0	Medium intensity and hold until next intense training cycle

Economical Anabolic Diet & Supplement Program

Follow the same menu plan as above. Follow your pre- & post-workout feedings as described in the above menu plan, use a multivitamin and mineral formula daily, and include the following recommendations:

- dotFIT CreatineXXL™
  - A supercharged creatine formula to improve upon the well-known size and performance enhancing effects of creatine-monohydrate. Designed to deliver increased strength-endurance, intensity (beta-alanine) and much greater cell volume effects (glycine and glutamine) than creatine alone, all leading to greater strength, size and performance gains
  - Take as shown below (dosage shown is for anyone under 200 LBS and can be adjusted upward for heavier athletes, or dotFIT CreatineMonohydrate added as desired)
- dotFIT Recover&Build™
  - Provides the branched-chain amino acids (BCAA), leucine, isoleucine and valine in an ideal ratio with the goal of reducing exercise-induced muscle damage while enhancing recovery, minimizing soreness leading to increasing muscle, especially during low calorie or intense training phases (take as directed with your pre-workout snack)

CreatineXXL™ Strategy

Table 4: CreatineXXL™ Strategy

Week No.	Capsules per Day	Time	Training Intensity
1	8	30 min before workout (WO)*	High
2	12	8 caps 30 min before WO* (4 caps immediately after)	High
3	16	8 caps 30 min before WO* (8 caps immediately after)	High
4	16	8 caps 30 min before WO* (8 caps immediately after)	High
5	16	8 caps 30 min before WO* (8 caps immediately after)	High
6	16	8 caps 30 min before WO* (8 caps immediately after)	High
7	16	8 caps 30 min before WO* (8 caps immediately after)	High
8	16	8 caps 30 min before WO* (8 caps immediately after)	High
9	16	8 caps 30 min before WO* (8 caps immediately after)	High
10	16	8 caps 30 min before WO* (8 caps immediately after)	High
11	12	8 caps 30 min before WO* (4 caps immediately after)	Peak of training program or week of competition
12	8	split throughout the day	Off
13	0	0	Low/Med
14	0	0	Med/High

* For the maximum effect of creatine supplementation and increases in cell volume, all dosages should be taken with 25-45g of carbohydrate.

A Final Word

We have presented a significant amount of information to digest. Read it, re-read it and put the information into practice. If you diligently follow the recommendations outlined in this article, you will be amazed at the pace at which your body increases muscle size and strength. If you have been at a plateau and thought adding muscle was no longer possible, then rejoice in the knowledge that you have an arsenal of weapons at your disposal that can allow you to naturally maximize your muscle building physiology. Remember how bodybuilders used to think adding ten pounds in a year was progress? Doing everything correctly, this should be possible in a matter of three months even for the most seasoned athletes, and certainly in less time for the younger population. Now get out there and train hard, and eat smart consistently.

References

1 Staron RS, Karapondo DL, Kraemer WJ, et al. Skeletal muscle adaptations during early phase of heavy-resistance training in men and women. J Appl Physiol 1994;76:1247
2 Green H, Goreham C, Ouyang J, Ball-Burnett M, Ranney D. Regulation of fiber size, oxidative potential, and capillarization in human muscle by resistance exercise. Am J Physiol 1999;276:R591
3 McCall GE, Byrnes WC, Dickinson A, Pattany PM, Fleck SJ. Muscle fiber hypertrophy, hyperplasia, and capillary density in college men after resistance training. J Appl Physiol 1996;81:2004
4 Biolo G, Maggi SP, Williams BD, Tipton KD, Wolfe RR. Increased rates of muscle protein turnover and amino acid transport after resistance exercise in humans. Am J Physiol 1995;268:E514

5 Chesley A, MacDougall JD, Tarnopolsky MA, Atkinson SA, Smith K. Changes in human muscle protein synthesis after resistance exercise. J Appl Physiol 1992;73:1383
6 Yarasheski KE, Pak-Loduca J, Hasten DL, et al. Resistance exercise training increases mixed muscle protein synthesis rate in frail women and men 76 yr old. Am J Physiol 1999;277:E118
7 Kimball SR, Farrell PA, Jefferson LS. Invited Review: Role of insulin in translational control of protein synthesis in skeletal muscle by amino acids or exercise. J Appl Physiol. 2002 Sep;93(3):1168-80. Review.
8 Tipton KD, Rasmussen BB, Miller SL, Wolf SE, Owens-Stovall SK, Petrini BE, Wolfe RR. Timing of amino acid-carbohydrate ingestion alters anabolic response of muscle to resistance exercise. Am J Physiol Endocrinol Metab. 2001 Aug;281(2):E197-206.
9 Koopman R, Wagenmakers AJ, Manders RJ, Zorenc AH, Senden JM, Gorselink M, Keizer HA, van Loon LJ. Combined ingestion of protein and free leucine with carbohydrate increases postexercise muscle protein synthesis in vivo in male subjects. Am J Physiol Endocrinol Metab. 2005 Apr;288(4):E645-53. Epub 2004 Nov 23.
10 Esmarck B, Andersen JL, Olsen S, Richter EA, Mizuno M, Kjaer M. Timing of postexercise protein intake is important for muscle hypertrophy with resistance training in elderly humans. J Physiol. 2001 Aug 15;535(Pt 1):301-11.
11 Bird SP, Tarpenning KM, Marino FE. Liquid carbohydrate/essential amino acid ingestion during a short-term bout of resistance exercise suppresses myofibrillar protein degradation. Metabolism. 2006 May;55 (5):570-7.
12 Baty JJ, Hwang H, Ding Z, Bernard JR, Wang B, Kwon B, Ivy JL. The effect of a carbohydrate and protein supplement on resistance exercise performance, hormonal response, and muscle damage. J Strength Cond Res. 2007 May;21(2):321-9.
13 Paddon-Jones D, Sheffield-Moore M, Aarsland A, Wolfe RR, Ferrando AA. Exogenous amino acids stimulate human muscle anabolism without interfering with the response to mixed meal ingestion. Am J Physiol Endocrinol Metab. 2005 Apr;288(4):E761-7. Epub 2004 Nov 30.
14 Cribb PJ, Hayes A. Effects of supplement timing and resistance exercise on skeletal muscle hypertrophy. Med Sci Sports Exerc. 2006 Nov;38(11):1918-25.
15 Rasmussen BB, Tipton KD, Miller SL, Wolf SE, Wolfe RR. An oral essential amino acid-carbohydrate supplement enhances muscle protein anabolism after resistance exercise. J Appl Physiol. 2000 Feb;88(2):386-92.
16 Cockburn E, Hayes PR, French DN, Stevenson E, St Clair Gibson A. Acute milk-based protein-CHO supplementation attenuates exercise-induced muscle damage. Appl Physiol Nutr Metab. 2008 Aug;33(4):775-83.
17 Luden ND, Saunders MJ, Todd MK. Postexercise carbohydrate-protein- antioxidant ingestion decreases plasma creatine kinase and muscle soreness. Int J Sport Nutr Exerc Metab. 2007 Feb;17(1):109-23.
18 Millard-Stafford M, Childers WL, Conger SA, Kampfer AJ, Rahnert JA. Recovery nutrition: timing and composition after endurance exercise. Curr Sports Med Rep. 2008 Jul-Aug;7(4):193-201. Review.
19 Miller SL, Tipton KD, Chinkes DL, Wolf SE, Wolfe RR. Independent and combined effects of amino acids and glucose after resistance exercise. Med Sci Sports Exerc. 2003 Mar;35(3):449-55.
20 Wojtaszewski JF, Nielsen JN, Richter EA. Invited review: effect of acute exercise on insulin signaling and action in humans. J Appl Physiol. 2002 Jul;93(1):384-92. Review.
21 Tarnopolsky MA, MacDougall JD, Atkinson SA. Influence of protein intake and training status on nitrogen balance and lean body mass. J Appl Physiol 1988 Jan;64 (1):187-93.
22 Minghelli G, Schutz Y, Charbonnier A, Whitehead R, Jequier E. Twenty-four-hour energy expenditure and basal metabolic rate measured in a whole-body indirect calorimeter in Gambian men. Am J Clin Nutr 1990 Apr;51(4):563-70.
23 Spruce N. Plateaus and energy expenditure. Increased difficulty in attending fat or weight loss goals in healthy subjects. J Nat Intr Recr Sports Ass 1997 Fall; 22 (1):24-28.

Appendix 4: dotFIT Product Manufacturing and Testing

Below are dotFIT's manufacturing partners who currently use 3rd party testing/audits and methods to quantify and qualify each product.

Robinson Pharma, Inc.

Provider of manufacturing services including soft-gels, tablets, and hard-shell capsules to dotFIT.

Quality is Our Business

Robinson Pharma, Inc. (RPI) is regulated by the FDA for all manufacturing of dietary supplements and must, by law comply with federal standards (21 CFR Part 111). As an extra assurance of compliance and quality RPI contracts with a number of highly respected third party expert organizations that periodically audit, and at their discretion, certify our facilities, practices, and products as compliant with published standards. These certifiers are:

USP DSVP (United States Pharmacopeia - Dietary Supplement Verification Program). USP is the publisher of the United States Pharmacopeia and they offer verification our facilities, practices, and offer highly rigorous product specific certification.

NPA cGMP (The Natural Products Association - current Good Manufacturing Practices) NPA is the oldest and largest trade association in nutritional products industry and offers their GMP Program which certifies compliance of facilities and practices.

STR RQP (Specialized Technology Resources - Retailer Qualification Program). A well established program requested by many mass marketers that verifies facilities, practices, and offers post manufacturing market surveillance.

Robinson Pharma's SOPs require that all active and inactive ingredients and components for each batch of product are tested for conformance to specifications. Tests include confirmation of identity, potency, and purity. SOPs also stipulate that finished products are tested for purity prior to release. Furthermore, key marker ingredients are tested to confirm that finished product meet label claim. All tests are performed by qualified operators using valid analytical methods on calibrated instruments.

RPI maintains extensive in house quality labs that were recently expanded at the cost of over $3,000,000.00. The RPI quality team includes over 50 dedicated staff members not including managers. The RPI on-site laboratory equipment currently includes:

Physical & chemical purity and potency
HPLC (with PDA and ELSD detectors)
UPC
HP-TLC
LC-MS
FT-IR
NIR
TOC
UV-Vis Spectrophotometer

Fatty Acid Analysis
GC w/Headspace analysis
Physical Characteristics
Moisture Balance
Dissolution and Disintegration testers
Heavy Metal Contamination Analysis
ICP/MS
AA MS

Microbial Contamination Analysis
Conventional Microbiological testing

In addition to on-premises testing, RPI contracts for third party testing with STR, Silliker Labs, and other labs for ingredients and finished products as needed.

Learn more about our partners visit:
www.NPAInfo.org
www.STRquality.com
www.USP.org
www.silliker.com

Integrity Nutraceuticals
Manufacturer of powders for dotFIT.

Integrity maintains a strict quality program on all raw materials and finished products. All incoming raw materials undergo microbiological testing, heavy metals testing, contaminant testing and analysis for assay if applicable. For protein products in particular, all incoming raw materials are specifically tested to ensure protein content is attained in accordance with the specifications. All finished product is tested again for micro and heavy metals along with assays based on the type of product. This is all done via in-house equipment and varies by ingredient. Integrity currently has the following equipment to perform these tests: HPLC, FTIR, Soleris, LCMSMS, and AA. In-process testing is also conducted via FTIR and HPLC to ensure that a proper blend has been achieved. FTIR provides a fingerprint of the blend, whereas HPLC provides specific detail on an analyte.

NSF – note: Certified for Sport™
Good Manufacturing Practices are regulatory requirements that provide guidelines for necessary processes, procedures and documentation, assuring the product produced has the identity, strength, composition, quality and purity it is represented to possess. NSF conducted a plant audit of Integrity's facility to verify compliance with GMPs and continues to conduct periodic audits of the facility to ensure continued conformance. GMPs for the current NSF Dietary Supplements Program are included in NSF American National Standard 173-Dietary Supplements, the only American National Standard for Dietary Supplement, and are consistent with the requirements that FDA has laid out in 21 CFR § 111.
http://www.nsf.org/business/athletic_banned_substances/index.asp?program=AthleticBanSub

To meet the growing demands of athletes, coaches and anyone concerned about banned substances in sports supplements, NSF International created the new NSF Certified for Sport™ Program. This new NSF program is a focused solution designed to minimize the risk that a dietary supplement or sports nutrition product contains banned substances.

Objective
The program objective is to certify that participating manufacturers of sports supplements have met NSF's stringent independent certification process guidelines, which were developed through a consensus process involving regulatory, industry and consumer groups. A key component of this program will be a specially designed NSF Mark on each product label to show athletes, coaches and consumers that a sports supplement has met NSF's comprehensive program guidelines.

This program, which focuses primarily on the sports supplement manufacturing and sourcing process, provides key preventive measures to:
- Protect against adulteration of products
- Verify label claims with product contents
- Identify athletic banned substances in the finished product or ingredients

Credibility
This program is part of NSF's successful 60-year history of providing certification programs for food, water and consumer goods. Specifically, the NSF Certified for Sport™ Program builds on NSF's expertise in the areas of dietary supplements and functional foods:

- NSF developed and maintains the only accredited American National Standard to certify dietary supplements, NSF/ANSI Standard 173.
- By building on NSF/ANSI 173, NSF developed a comprehensive product testing program in NSF accredited laboratories and an extensive manufacturing process evaluation to ensure the actual product contents match those printed on the label.
- NSF's history of independence led to a partnership with the National Football League (NFL) and the NFL Players Association to develop and administer the NFL/NFLPA Supplement Certification Program, a first-of-its-kind program designed especially for professional football.

The NSF Athletic Banned Substances Certification Program

- APPLICATION
  - Formulation
  - Label
  - Ingredient supplier's information
  - Manufacturing facility's information

- • TOXICOLOGY REVIEW
  - Label and formulation review and comparison
  - Ingredient review
  - Determine product testing

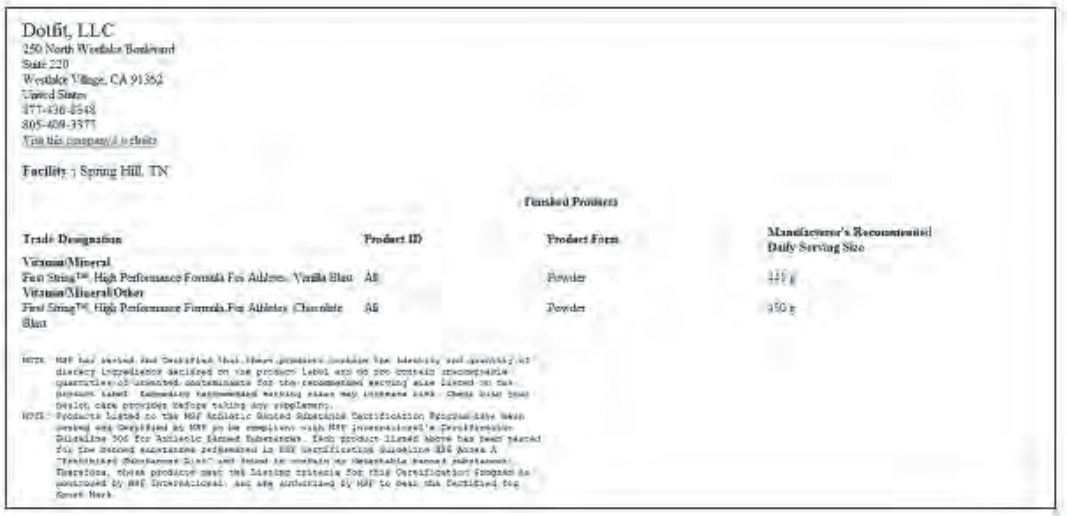
- FACILITY INSPECTION
  - Good Manufacturing Practices (GMP) audits of production facilities

  - Observations of in-house laboratories
  - Sourcing and traceability procedures
  - Schedule of ingredient supplier audits based on number of suppliers

- ANNUAL LABORATORY TESTING/ANALYSIS
  - Microbiological
  - Heavy metals
  - Pesticides/herbicides
  - Label content verification
  - Disintegration
  - Banned substances testing based on number of lots

- PRODUCT CERTIFICATION/LISTING
  - Monitor formulation/ingredient supplier changes
  - Unannounced follow-up audits
  - Marketplace sampling

http://www.nsf.org/Certified/BannedSub/Listings.asp



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877-436-8548
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Visit this company's website

Facility : Spring Hill, TN

Finished Products

Trade Designation	Product ID	Product Form	Manufacturer's Recommended Daily Serving Size
Vitamin/Mineral			
Fast String™ High Performance Formula For Athletes - Vanilla Blast	A8	Powder	111 g
Vitamin/Mineral/Other			
Fast String™ High Performance Formula For Athletes - Chocolate Blast	A6	Powder	150 g

NOTE: NSF has tested and Certified that these products contain the identity and quantity of dietary ingredients declared on the product label and do not contain unacceptable quantities of unlisted contaminants for the recommended serving size listed on the product label. Exceeding recommended serving sizes may increase risk. Check with your doctor, care provider before taking any supplement.
NOTE: Products Listed in the NSF Athletic Dietary Supplements Certification Program have been tested and Certified by NSF to be compliant with NSF International's Certification Guideline 306 for Athletic Banned Substances. Each product listed above has been tested for the banned substances referenced in NSF Certification Guideline 306 Annex A "Prohibited Substances List" and found to contain no detectable banned substances. Therefore, these products meet the listing criteria for this Certification Program as announced by NSF International, and are authorized by NSF to bear the Certified for Sport Mark.

Prohibited Substance List

The NSF Prohibited Substances List includes banned substances, identified by leading sports organizations, such as the World Anti-Doping Agency (WADA), the National Football League (NFL) and Major League Baseball (MLB). The NSF Certified for Sport™ Program certifies products and inspects facilities for a range of substances. These include the following:

- Stimulants
- Narcotics
- Steroids
- Diuretics
- Beta-2-Agonists
- Beta Blockers
- Masking Agents
- Other Substances

The program will be updated regularly based on the latest scientific developments in detecting banned substances and through input from regulators, industry and consumer groups in the international sports community. The specific list is located in Annex A of the NSF Athletic Banned Substances Guideline-306-2005.

Garden State Nutritionals

Manufacturer of tablets, capsules, powders, liquids (shots to multi-serving containers), creams, gels, soft chews and gummies.

Garden State Nutritionals (GSN) has built a reputation over three decades as a trusted leader in the formulation, development and manufacture of custom dietary supplements. GSN also has an international reputation, supplying dietary supplements to more than 35 countries around the world. GSN is one of a select group of manufacturers to have received certification and approval from Australia's Therapeutic Goods Administration (TGA). As dietary supplements for the Australian market must be manufactured to pharmaceutical standards, TGA approval is the ultimate confirmation of superior quality.

Garden State takes pride in their ability to innovate, creating more than 2000 new products every year. GSN is one of the largest custom contract manufacturers of nutritional supplements in the United States. In addition to GSN's own highly skilled Product Development group, the company also maintains a Scientific Advisory Board. This multidisciplinary team includes leading research scientists, molecular biologists, physicians, pharmacists, clinical nutritionists, herbalists, food technologists, and sports physiologists.

GSN's FDA-inspected facility operates under strict Good Manufacturing Practices (GMP). Their kosher-approved facilities have been audited and approved by leading independent bodies as well.

From raw material analysis to final product inspection, every production step is carefully monitored and documented, with full accountability and in-process controls. GSN's ongoing commitment to superior quality is backed up by rigorous analysis of products in our own in-house testing laboratories.

The Quality Control/Analytical Development Department of GSN consists of a highly trained staff of 15 degreed chemists under the supervision of our resident Ph.D. The department performs testing and inspection pertaining to the approval and release of all incoming raw materials and finished products. GSN's Quality Assurance Department has broad responsibilities and authority in the following areas:

- Quality Improvement — Quality improvement is based on the premise that all work activities can be planned, performed, measured, and improved.
- Personnel GMP Training and Qualification — all employees who come into contact with products must begin GMP training within the first month of employment. GMP training continues on a regular basis throughout the length of employment. Tests are given to monitor the effectiveness of training.
- Internal Audits — QA inspectors monitor all phases of production to assess performance and adherence to GMP and to the SOPs of each department.
- External Audits — QA oversees and supervises inspections and audits of facilities by domestic and international regulatory bodies, as well as by customers and independent auditing firms.
- Supplier Qualification — GSN maintains an audit program to verify suppliers' ability to provide consistent products that meet strict quality requirements.
- Document and Record Control — QA is responsible for maintaining all documents, records and Standard Operating Procedures, making sure that they are up to date.
- Inspection and Acceptance Testing — QA has the authority to release and reject any component or finished product that does not meet specifications.
- Non-Conformances — QA handles the identification, documentation, control, investigation and disposition of all non-conforming materials, components and final products.

GSN's laboratory equipment and capabilities include:

- Chemical Analysis (guarantees label claims for potency)
    - Fourier Transform Infrared (FT-IR) and Near Infrared (N-IR) Spectrometers — for positive identification fingerprinting of incoming raw materials.
    - High Performance Liquid Chromatography (HPLC) — for accurate quantitative analysis of vitamins, amino acids and botanical actives. The 7 Waters HPLC Instruments are all interfaced to a Millennium 32 Client/Server System for seamless data integration.
    - Perkin-Elmer Inductively Coupled Plasma Emission Spectrometer (ICP) — for precise analysis of nutrient minerals and heavy metals.
    - Beckman UV/Visible Spectrometer — for quantitative analysis by light absorption.
    - Brinkmann Automatic Titrator — for wet chemical assays.
    - Tablet Dissolution/Disintegration equipment — to guarantee conformance with rigid USP specifications.
- Physical Analysis (guarantees consistency and uniformity)
    - Physical testing equipment determines tablet weight, hardness, thickness, and friability, as well as tap density and particle size of powders.
- Microbiological Analysis (guarantees purity)
    - A complete Microbiology Lab guarantees that raw materials and finished products comply with strict USP requirements.
- Stablility Analysis (guarantees shelf life)
    - Accelerated shelf-stability testing is performed in a range of humidified and non-humidified chambers.

GSN is a fully compliant GMP manufacturing and packaging facility. The company is duly licensed and regularly inspected by State and Federal health authorities. Additionally, GSN undergoes frequent GMP

audits by their clients, who confirm our GMP compliance either with their own teams or by engaging independent auditors.

Regulatory Assistance
Since the passage of the Dietary Supplements Health and Education Act in 1994, regulatory compliance has become increasingly complex. The Regulatory Affairs and Information Services team offers the following services:

- Full label review - ensures accuracy and regulatory compliance
- International registration assistance
- Formula modifications — to adapt to the requirements of each country
- Full-time Health Canada consultant — to keep pace with the rapidly changing regulatory environment
- Full service testing, including microbiological and stability studies

QUALITY CONTROL LABOROATRY

SERVICES AND CAPABILITES

The GSN Quality Control Laboratory performs analytical testing of raw materials, in-process samples, and finished goods in a cGMP /GLP compliant facility.

CHEMISTRY CAPABILITIES

- Methods
  - USP/NF, BP, AOAC, in-house, and client supplied methods are utilized.

- Tests Performed
  - Vitamin and Dietary Supplement Assays
  - Dissolution and Disintegration according to USP and compendia procedures.
  - Elemental analysis of minerals
  - Physical Testing including Partial Size, Friability, Hardness, and Weight Variation.
  - Moisture analysis via Loss on Drying and Karl Fischer techniques.
  - Identification via spectroscopy
  - Wet Chemical Analysis
  - Organic Volatile Impurities (OVI)
  - Pesticides Analysis
  - Heavy Metals Testing for various Regulatory Compliance

- Instrumentation
  - HPLC / UPLC systems equipped with UV/VIS, PDA, RI, and ELSD detectors.
  - UPLC /MS/MS system with ESI and APCI modes.
  - GC system with PID,FID, ECD, detection and headspace auto sampling.
  - FTIR and NIR spectroscopy systems
  - ICP /MS – inductively coupled plasma spectroscopy
  - Automated Disintegration and Dissolution apparatus
  - Automated Titration equipment
  - Automated Moisture Determination equipment

MICROBIOLOGY CAPABILITIES

- Methods
  - USP/NF, BP, AOAC, FDA-BAM, and client supplied methods are utilized.

- Tests Performed
  - Microbial Limits

- Probiotic Assays
- Antimicrobial Effectiveness Testing (AEI)
- Tests for Specified Organisms
- Water and Environmental Monitoring

- Instrumentation
  - Viteck automated Microbial Identification System
  - Tempo automated Microbial Assay system

ADDITIONAL LABORATORY SERVICES

- Stability Testing according to ICH guidelines and customized storage conditions.
- Method Development and Validation
- Technology transfer of analytical methodology.

FACILITY AND STAFF

- State-of-the-Art laboratory staffed with 20+ highly qualified professionals all with extensive industry experience.
- Integrated LIMS system

Bakery Barn
Manufacturer of Protein Sticks, Breakfast Bars, Meal Replacement Bars and Treats for dotFIT.

During the production process, a sample unit is pulled from the packaging line every hour. All the collected bars are sent to an independent lab for microbiological testing. Bakery Barn (BBI) currently utilizes two independent labs for microbiological testing, Microbac Labs and Eurofins Labs.

Bakery Barn uses a very strict standard of 10,000 or under for an acceptable measuring for Aerobic Plate Count. There is no "industry standard", "safe", or "unsafe" level of Aerobic Plate Count; it is simply a measure.

BBI maintains an extensive "Retains" program where random samples selected throughout the day for every lot are retained on site for a minimum of 90 days after the expiration date of the lot. In the event of a broad range of situations ranging from a major ingredient recall to a consumer question regarding the pattern of icing on a particular product, we can pull actual samples from the same lot for further examination and/or testing.

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Your Fitness. Connected.

SKU 1900
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Second Edition
2012