

# Snack User Guide

# Snack

- ✓ is learning software for anyone with interest in nutrition
- ✓ gives user the ability to quantify food intake and the possibility to prepare customized meals that meet specific requirements
- ✓ can be used to quantify any popular diet for comparison and research purposes

How to use

# 1. Add food items to database

Gui2

File

**Nutritional Fact**

Category: **Dairy**

Name:

Serving Size:

Calories:

Fat:

Sodium:

Carbohydrate:

Fiber:

Protein:

Is Complete? **True**

Saturated Fat:

Monounsaturated Fat:

Polyunsaturated Fat:

Cholesterol:

Cost:

**Food List**

Search:

Category	Name	Quantity	Calories	Fat	Sodium	Carbs	Fiber	Protein	Complete	Incompl...	SatFat	MonouFat	PolyuFat	Cholest...	Cost
Legumes	Beans,P...	100	143	1	1	17	9	9.0	0	9	0	0	0	0	1
Oils	Oil,Olive,...	100	884	100	2	0	0	0.0	0	0	14	73	11	0	1
Dairy	Milk,Dry,...	100	358	1	549	52	0	35.0	0	0	0	0	0	18	1
Meat	Egg,Whl...	100	155	11	124	1	0	13.0	0	0	3	4	1	373	1
Other	Honey	100	304	0	4	82	0	0.0	0	0	0	0	0	0	1
Meat	Fish,Tun...	100	86	1	247	0	0	19.0	0	0	0	0	0	36	1
Dairy	Milk,Non...	100	34	0	42	5	0	3.0	0	0	0	0	0	2	1
Vegeta...	Yambea...	100	38	0	4	4	5	1.0	1	0	0	0	0	0	1
Other	Mcdonal...	100	264	10	494	29	1	13.0	0	0	4	4	1	27	1
Other	Fst Foo...	100	312	15	210	37	4	3.0	3	2	6	5	0	0	1
Other	Beverag...	100	42	0	3	10	0	0.0	0	0	0	0	0	0	1
Other	Sweete...	100	336	0	0	91	0	0.0	0	0	0	0	0	0	1
Other	Sugars,...	100	387	0	1	100	0	0.0	0	0	0	0	0	0	1
Other	Cereals,...	100	371	7	3	59	9	14.0	14	1	2	2	0	1	1
Fruits	Sweet P...	100	86	0	55	17	3	2.0	2	0	0	0	0	0	1
Fruits	Orange,...	100	47	0	0	10	2	1.0	1	0	0	0	0	0	1
Fruits	Apples,...	100	52	0	1	12	2	0.0	0	0	0	0	0	0	1
Fruits	Banana...	100	89	0	1	20	3	1.0	1	0	0	0	0	0	1
Oils	Chickpe...	100	378	6	24	51	12	20.0	20	1	1	3	0	1	1
Legumes	Chickpe...	100	139	3	246	17	6	7.0	7	0	0	1	0	1	1
Grains	Bread,W...	100	290	4	537	52	3	9.0	9	1	1	2	1	1	1
Vegeta...	Potatoe...	100	77	0	6	15	2	2.0	2	0	0	0	0	0	1
Legumes	Beans,B...	100	132	1	1	15	9	9.0	9	0	0	0	0	0	1
Oils	Oil,Canola	100	884	100	0	0	0	0.0	0	7	63	28	0	1	1
Nuts	Peanuts...	100	587	50	6	13	8	24.0	24	8	26	10	0	1	1
Nuts	Almond...	100	598	53	3	10	11	21.0	21	4	33	13	0	1	1
Vegeta...	Broccoli...	100	35	0	41	4	3	2.0	2	0	0	0	0	0	1
Fish	Salmon,...	100	206	12	61	0	0	22.0	0	2	4	5	63	1	1
Grains	Rice,Whi...	100	130	0	1	28	0	3.0	3	0	0	0	0	0	1
Vegeta...	Broccoli...	100	34	0	33	4	3	3.0	3	0	0	0	0	0	1
Vegeta...	Spinach...	100	23	0	79	2	2	3.0	3	0	0	0	0	0	1
Fruits	Kwifruit,...	100	61	1	3	12	3	1.0	1	0	0	0	0	0	1
Fruits	Mangos...	100	60	0	1	13	2	1.0	1	0	0	0	0	0	1
Fruits	Guavas,...	100	69	1	37	12	5	1.0	1	0	0	0	0	0	1
Fruits	Pears,R...	100	57	0	1	12	3	0.0	0	0	0	0	0	0	1
Fruits	Peaches...	100	39	0	0	8	2	1.0	1	0	0	0	0	0	1
Fruits	Plums,R...	100	46	0	0	10	1	1.0	1	0	0	0	0	0	1
Fruits	Pineapp...	100	50	0	1	12	1	1.0	1	0	0	0	0	0	1
Grains	Pasta,W...	100	352	3	6	64	9	14.0	14	0	0	1	0	1	1

Solve Compare Database

## 2. Create a new mix and add food to it.

The screenshot displays the 'Gui2' software interface. At the top, a 'File' menu is visible. The main window is divided into several sections:

- Mix Result Table:** A table showing the composition of a mix. The columns include Name, Quantity, Calories, Fat, Sodium, Carbs, Fiber, Protein, Complete, Incomp..., SatFat, Monou..., PolyFat, Choles..., and Cost. The rows list 'Oil, Olive, Salad Or Cooking', 'Beans, Pinto, Mature Seeds, Ckd, Bld, Wo/Salt', 'Vegetables, Mxd, Frz, Unprep', and a 'Total' row.
- Mix Summary Table:** A table showing the percentage breakdown of the mix. The columns are Result and Value. The rows are Fat(%): 29, Carbs(%): 39, Protein(%): 17, and Other(%): 15.
- Mixes List:** A list on the left side containing 'Mix3', 'Mix2', and 'Mix1' (which is selected).
- Food Selection Panel:** A tree view of food categories including Food, Dairy, Fish, Fruits, Grains, Legumes, Meat, Mushrooms, Nuts, Oils, Other, and Vegetables. The 'Fish' category is expanded, showing 'Chunk Light Tuna', 'Salmon, Atlantic, Farmed, Ckd, Dry Heat', and 'Tuna, Lt, Cnd In Oil, Drnd Sol'. A list of selected items is shown on the right: 'Beans, Pinto, Mature Seeds, Ckd, Bld, Wo/Salt', 'Oil, Olive, Salad Or Cooking', and 'Vegetables, Mxd, Frz, Unprep'.
- Mix Note:** A text area containing 'Hello, World!'.
- Navigation and Controls:** Buttons for '+', '-', and 'U' are located below the mixes list. At the bottom, there are tabs for 'Mix Food', 'Nutrient Constraint', 'Food Constraint', 'Ratio Constraint', and 'Model'. A 'Minimize' button and a 'Calories' input field with a 'Run' button are also present.

3. Create a nutrient constraint (optional). For example, I would like this mix to contain 40 g of fiber or more.

**Mix Result**

Name	Quantity	Calories	Fat	Sodium	Carbs	Fiber	Protein	Complete	Incomp...	SatFat	Monou...	PolyuFat	Choles...	Cost
Oil,Olive,Salad Or Coo...	20	177	20	0	0	0	0	0	0	3	15	2	0	0.2
Beans,Pinto,Mature S...	235	336	2	2	40	21	21	0	21	0	0	0	0	2.3529...
Vegetables,Mxd,Frz,U...	471	339	5	221	42	19	14	0	14	0	0	0	0	4.7058...
<b>Total</b>	<b>726</b>	<b>852</b>	<b>27</b>	<b>224</b>	<b>82</b>	<b>40</b>	<b>35</b>	<b>0</b>	<b>35</b>	<b>3</b>	<b>15</b>	<b>2</b>	<b>0</b>	<b>7.2588...</b>

**Mix Summary**

Result	Value
Fat(%)	29
Carbs(%)	39
Protein(%)	17
Other(%)	15

**Mixes**

- Mix3
- Mix2
- Mix1**

**Nutrient Constraints**

Nutrient	Relationship	Value
Fiber	>=	40

**Nutrient**

- Serving Size
- Calories
- Fat
- Sodium
- Carbohydrates
- Fiber**
- Protein
- Saturated Fat
- Monounsaturated Fat
- Polyunsaturated Fat
- Cholesterol
- Complete Protein
- Incomplete Protein
- Cost
- Fat Kcal
- Carbs Kcal
- Protein Kcal
- Saturated Fat Kcal
- Monounsaturated Fat Kcal
- Polyunsaturated Fat Kcal

**Relationship**

- >=
- <=
- =

**Quantity**

40.0

**Mix Note**

Hello, World!

**Buttons:** +, -, U, Run

**Navigation:** Mix Food, **Nutrient Constraint**, Food Constraint, Ratio Constraint, Model

**Minimize:** Calories

**Footer:** Solve, Compare, Database

4. Create a food constraint (optional). For example, I would like this mix to contain 20 g of olive oil.

**Mix Result**

Name	Quantity	Calories	Fat	Sodium	Carbs	Fiber	Protein	Complete	Incomp...	SatFat	Monou...	PolyuFat	Choles...	Cost
Oil, Olive, Salad Or Coo...	20	177	20	0	0	0	0	0	0	3	15	2	0	0.2
Beans, Pinto, Mature S...	235	336	2	2	40	21	21	0	21	0	0	0	0	2.3529...
Vegetables, Mxd, Frz, U...	471	339	5	221	42	19	14	0	14	0	0	0	0	4.7058...
Total	726	852	27	224	82	40	35	0	35	3	15	2	0	7.2588...

**Mix Summary**

Result	Value
Fat(%)	29
Carbs(%)	39
Protein(%)	17
Other(%)	15

**Mixes**

- Mix3
- Mix2
- Mix1

**Food**

- Beans, Pinto, Mature Seeds, Ckd, Bld, Wo/Salt
- Oil, Olive, Salad Or Cooking
- Vegetables, Mxd, Frz, Unprep

**Relationship**

- >=
- =
- <=

**Quantity**

20.0

**Food Constraints**

Food	Relationship	Value
Oil, Olive, Salad Or Cooking	>=	20.0

**Mix Note**

Hello, World!

**Minimize**

Calories

**Run**

**Solve** **Compare** **Database**

After constraints have been created, click run button. Software will calculate right amounts of ingredients that meet constraints. If model is too constrained it will complain and user will need to either remove constraints or add extra food items.



This is what the math model for this specific mix is.  
It is there for informational and debugging purposes.

The screenshot shows a software interface titled "Gui2" with a menu bar containing "File". The main window is divided into several sections:

- Mix Result:** A table showing the composition of a mix.
- Mix Summary:** A table showing the percentage of various nutrients in the mix.
- Mixes:** A list of mixes (Mix3, Mix2, Mix1) with "Mix1" selected.
- Mix Note:** A text area containing "Hello, World!".
- Math Model:** A large text area containing the objective function and constraints.
- Navigation:** A set of tabs at the bottom: "Mix Food", "Nutrient Constraint", "Food Constraint", "Ratio Constraint", and "Model" (selected).
- Controls:** A "Minimize" dropdown menu set to "Calories" and a "Run" button.
- Footer:** Buttons for "Solve", "Compare", and "Database".

**Mix Result Table:**

Name	Quantity	Calories	Fat	Sodium	Carbs	Fiber	Protein	Complete	Incomp...	SatFat	Monou...	PolyuFat	Choles...	Cost
Oil,Olive,Salad Or Coo...	20	177	20	0	0	0	0	0	0	3	15	2	0	0.2
Beans,Pinto,Mature S...	235	336	2	2	40	21	21	0	21	0	0	0	0	2.3529...
Vegetables,Mxd,Frz,U...	471	339	5	221	42	19	14	0	14	0	0	0	0	4.7058...
Total	726	852	27	224	82	40	35	0	35	3	15	2	0	7.2588...

**Mix Summary Table:**

Result	Value
Fat(%)	29
Carbs(%)	39
Protein(%)	17
Other(%)	15

**Math Model:**

```
/* Objective function */  
min: 8.84 x0 + 0.72 x1 + 1.43 x2;  
/* Variable bounds */  
0.0 x0 + 0.04 x1 + 0.09 x2 >= 40.0;  
1.0 x0 + 0.0 x1 + 0.0 x2 >= 20.0;  
0.0 x0 + 1.0 x1 + -2.0 x2 = 0.0;
```

5. User may want to compare mixes to see what the difference is.

The screenshot shows a GUI application window titled "Gui2". On the left side, there are two vertical lists under the heading "Mixes". The first list, "Mix 1", contains "Mix 1", "Mix3", "Mix2", and "Mix1". The second list, "Mix 2", contains "Mix3", "Mix2", and "Mix1". The "Mix2" item in both lists is highlighted. To the right of these lists is a table titled "Mix Difference". The table has four columns: "Nutrient", "Mix 1", "Mix 2", and "Diff". Below the table is a large empty area. At the bottom of the window, there is a toolbar with three buttons: "Solve", "Compare", and "Database".

Nutrient	Mix 1	Mix 2	Diff
Serving Size	1,174	726	448
Calories	1,702	852	850
Fat	38	27	11
Sodium	1,009	224	785
Carbohydrates	142	82	60
Fiber	48	40	8
Protein	154	35	119
Saturated Fat	4	3	1
Monounsaturated Fat	21	15	7
Polyunsaturated Fat	5	2	3
Cholesterol	120	0	120
Complete Protein	104	0	104
Incomplete Protein	50	35	15
Cost	10	7	3
Fat Kcal	338	244	95
Carbs Kcal	569	329	240
Protein Kcal	616	141	475
Saturated Fat Kcal	32	25	7
Monounsaturated Fat Kcal	191	131	59
Polyunsaturated Fat Kcal	43	20	23

(Snack user guide working draft)

Please send your suggestions and comments to:

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`https://x-jrga.github.io/snack/index.html`