Enteral Nutrition Design

Theodora Chatzimichail, MD, Hellenic Complex Systems Laboratory, Drama, Greece

Hellenic Complex Systems Laboratory

1. Background

Enteral nutrition refers to the delivery of nutrition directly into the gastrointestinal tract, thereby providing part or all of a patient's caloric and nutritional requirements. It is the method of choice for the nutritional support of critically ill patients.

2. Methods

To assist the design of enteral nutritional formulae of blended foods, the freely available program Enteral Nutrition Design was developed in Wolfram Language.

It includes data of 2371 foods of the 2021 version of the Composition of Foods Integrated Dataset (CoFID), published by Public Health England (PHE) [1].

Using seven pairs of nested menus, suitable foods are selected from each of the following groups: (a) meat or fish, (b) cereal, (c) dairy product, (d) vegetable, (e) fruit, (f) oil or fat, and (g) miscallaneous foods.

3. Results

The quantities of the selected foods are calculated to comply with user-defined specifications: total required calories, fraction of protein calories, fraction of carbohydrate calories, maximum total water, sodium, potassium, calcium, magnesium and phosphorus content of the foods.

If the system of the linear equations derived from the user-defined specifications and the composition of the selected foods is solvable, then a nutritional formula is designed and a table of the quantities of the delected foods and their total proteins, fats, saturated fatty acids, carbohydrates, sugars, water, sodium, potassium, calcium, magnesium and phosphorus is generated (See Figure 1).

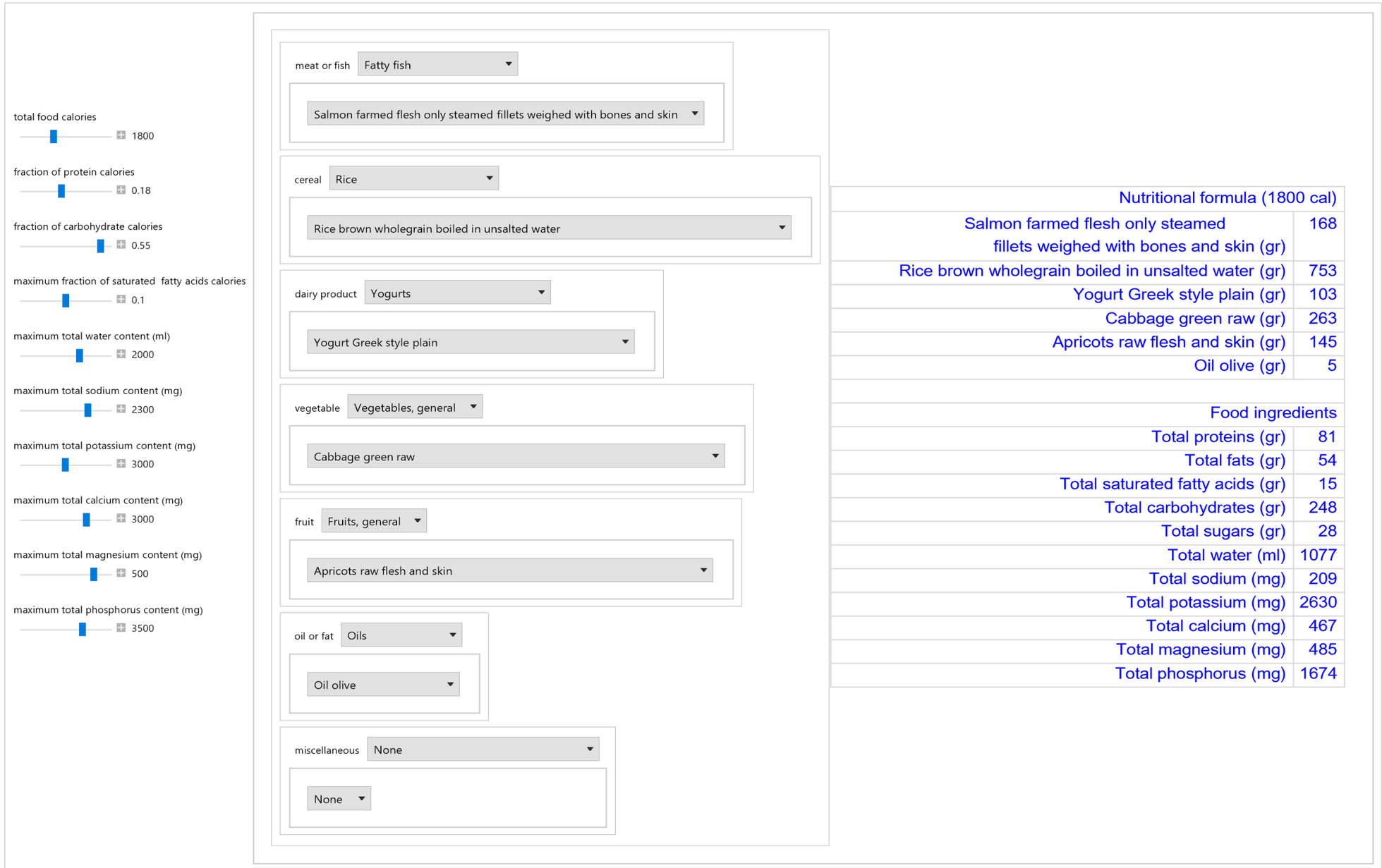

Figure 1. *Snapshot of the program Enteral Nutrition Design : Nutritional formula designed according to requirements shown at the left.*

4. Conclusion

Enteral Nutrition Design is a freely available user-friendly program for the design of patient-specific enteral nutritional formulae of blended foods.

5. References

1. Pinchen, H, Powell, N, Weiner, D et al. "McCance and Widdowson's The Composition of Foods Integrated Dataset 2021. User guide", 2021. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/971021/dataset_2021.pdf

6. Supplementary Material

The program Enteral Nutrition Design is freely available at: https://www.hcsl.com/Tools/Nutrtion/

Contact

Theodora Chatzimichail, MD, tc@hcsl.com