User Guide: The Thrifty Food Plan Calculator

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Overview

This calculator is a tool for learning about tradeoffs between the nutrition quality and costs of foods available in the United States. Your challenge is to create a nutritious, affordable, and tasty food plan that meets your own nutrition policy goals.

This challenge is similar to the task faced by USDA nutritionists and economists when they developed the Thrifty Food Plan (TFP). The maximum benefit level in the Food Stamp Program is based on the cost of the TFP. Every several years, USDA's Center for Nutrition Policy and Promotion (CNPP) revises the TFP to take account of new trends in food prices, food characteristics, and consumer spending behavior. USDA's most recent TFP revision is: *The Thrifty Food Plan, 2006*. This report is available on the CNPP website (http://www.cnpp.usda.gov/). To create this food plan, USDA used a mathematical algorithm that selected quantities for each food group. The quantities were chosen to be as similar as possible to the current average consumption of low-income Americans, while simultaneously meeting a cost target, nutrition standards, target levels for broad categories of foods (such as meats, dairy foods, fruits, and vegetables), and other constraints.

Our TFP Calculator is based on the same price, consumption and nutrition data that USDA used to create the official 2006 food plan. You can design your own new food plan by choosing monthly spending levels for 58 food groups. The TFP Calculator provides information on how your plan performs in terms of cost, dietary quality, and similarity to current consumption.

The worksheet allows you to investigate choices between food groups. For example, what happens if the quantity of dark green vegetables is raised and the quantity of tomatoes is lowered? The worksheet is not sufficiently detailed to investigate distinctions within one food group, such as the quality difference between organic and conventional dark green vegetables, the cost difference between a farmer's market and a grocery store, or differences between two varieties of dark green vegetables.

A good way to begin using the worksheet is to think about your own policy goals. Consider the similarities and differences between your goals and the goals set by USDA. Will you try to meet the USDA cost target, or a different one that better represents your assessment of a reasonable budgetary goal? Will you use USDA's constraints on total servings from Pyramid food categories, or choose your own goals (such as more or less red meat or fruits and vegetables), or remain agnostic about Pyramid food categories (preferring instead to find the most affordable diet that provides adequate nutrients)?

You may find this tool helpful for thinking quantitatively about some important policy-relevant questions:

- Is the high cost of healthy food a plausible contributor to unhealthy diets for Americans?

- What amount of money does a representative low-income person need to afford an adequate diet? Is the current maximum food stamp benefit sufficient?
- For your own policy goals and priorities, what is the best food plan?

You may also be able to shed light on more specific technical questions:

- Does USDA's measure of the distance from current average consumption serve well to distinguish more appealing diets (lower distance) from less tasty diets (greater distance)?
- What is the lowest amount of money that would suffice to provide good nourishment for a motivated family that cooks at home?
- How is the cost of the plan related to the constraint one puts on particular categories, such as the total for red meats, dairy, fruits, or vegetables?

Instructions are provided below to send us feedback on the worksheet itself, and also on what you learned from this tool about the affordability of nutritious food in the United States.

The Worksheets in this Excel File

The TFP Calculator and this User Guide are available at http://nutrition.tufts.edu/fpan/calculator. The Excel file includes 4 worksheets. The main worksheet containing the TFP Calculator is named **TFP**.

The worksheets named **Starting Values**, **Sources of Nutrients**, and **MyPyramid** are for reference purposes and will be explained later on in this instructions worksheet. Each of the worksheets can be accessed by clicking on the tab at the bottom of the Excel workbook window.

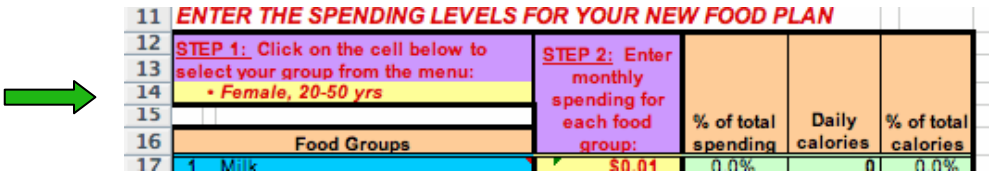
Designing Your New Food Plan

Go to the TFP Calculator by clicking on the worksheet tab named **TFP**.

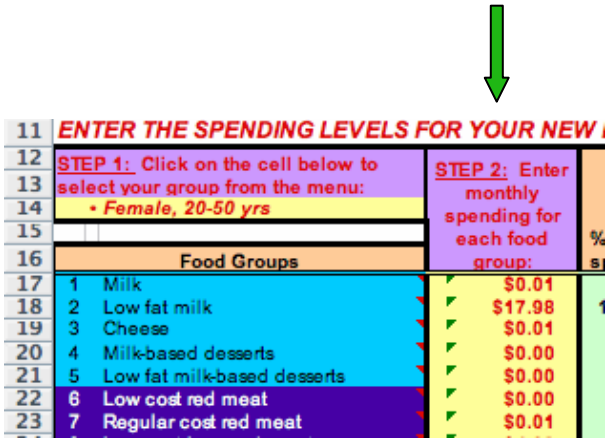
Begin by saving the Excel workbook using a new file name. This will ensure that any changes you make to the workbook will not accidentally overwrite the original Excel file. To reset the original starting values, close the file and reopen the original unchanged Excel workbook.

You can make changes to the values in the yellow cells of the TFP Calculator. The light green cells of the Calculator show the results of automatic calculations. Use the results appearing in these light green cells to evaluate your food plan in terms of cost, nutrition, and similarity to current consumption. Results appearing in the light green cells are automatically updated to reflect the effect of any modification made to the yellow cells.

Step 1: Choose a gender and age range
Choose a gender and age range (such as female 20-50 years old) from the drop-down menu in the yellow cell C14. There are 17 gender-age ranges used to develop the TFP, each with its own recommended nutrition standards, cost targets, and default starting values for the 58 food groups.



Step 2: Choose monthly spending levels for the 58 food groups.
The default values that appear in the original file are the monthly spending values according to the official USDA TFP. To change monthly spending amounts from these default values, enter numbers in the yellow cells and then hit "Return," "Enter," "Tab" or click on another cell.



Please note that after overwriting the default values in this section, going back to Step 1 and choosing a different gender-age group will no longer automatically fill in the default USDA TFP values. If you want to return to the default values, you must close the renamed Excel file and re-open the original file.

Hovering your pointer over any of the food group names in column C will bring up a comment box that provides examples of specific food items that are included in that food group.

Reference Worksheets

To get started, you may begin with the default monthly spending values, which come from USDA's official TFP. Alternatively, you may copy and paste values from the worksheet named **Starting Values**. For each of the four age-sex groups that constitute the reference family for the Food Stamp Program (child 6-8 years old, child 9-11 years old, female 20-50 years old, and male 20-50 years old), there are three sets of values included: the official TFP values, current consumption values, and the "cost only solution" values, which are the current consumption values scaled down to fit the TFP budget. For example, for females 20-50 years old, the TFP budget is about $118, which is 73% of the current consumption spending amount of $161. Therefore, the "cost only solution" values for each food group are 73% of the current consumption values.

For more information about the 58 food groups and the nutrients they contain, see the worksheet named **Sources of Nutrients**. This reference sheet shows which foods are the most concentrated sources for calories and selected nutrients. For each nutrient, the food groups are sorted in descending order, allowing users to easily find which food groups will provide the most concentrated source of a given nutrient, both by cost (amount of nutrient per dollar) and by

calorie (amount of nutrient per 1000 calories). The information in this worksheet will help you tailor your monthly spending amounts to make sure your food plan contains the recommended amount of calories and enough of certain nutrients (such as calcium or iron) while limiting intake of others (such as sodium or saturated fat).

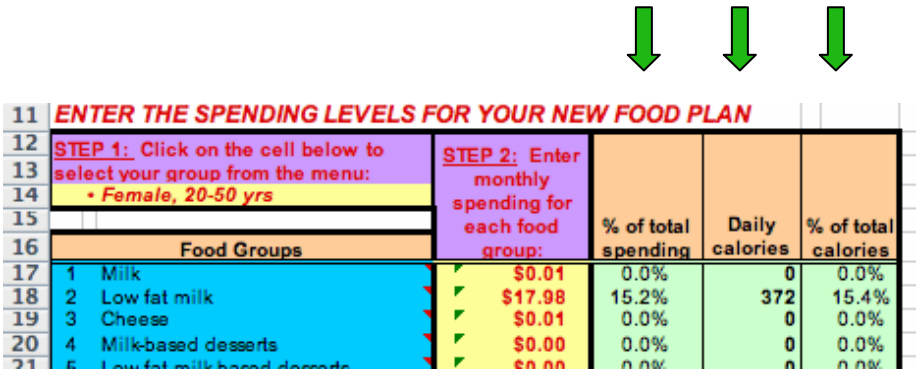
The color of the food group name appearing in column C (cells C17 through C74) of the **TFP** worksheet corresponds to the broad food category in USDA's MyPyramid. The worksheet named **MyPyramid** has additional information on recommendations that are based on these broad food categories.

Analyzing Your New Food Plan

In the light green cells of the **TFP** worksheet, you will find results that will enable you to evaluate your new food plan based on its cost, nutritional content, and palatability, and to compare those results to those of the official USDA TFP.

In developing the Thrifty Food Plan, USDA assumes that the price and nutritional content for food items within each of the 58 food groups are constant. This TFP Calculator also makes this simplifying assumption. For example, all vegetables belonging to the "Dark green vegetables" food group – such as broccoli, spinach, chard, collard greens, mustard greens, and kale – are assumed to have the same price per gram and nutrient content per gram. As a result, the TFP Calculator is more suited to analyzing choices between food groups rather than within food groups. Finally, the assumption of uniform price within a food group means that choosing a spending level for any given food group is equivalent to choosing a quantity for that food group.

Columns G, I and K show the share of monthly spending, daily calories, and share of daily calories that each of the 58 food groups provide.



The following results appear on the right side of the TFP worksheet. You may find it helpful to use these results in an iterative fashion, entering initial values for monthly spending for the 58 food groups and then using the results to observe the effect of these choices on cost, nutritional

content, and palatability. You may choose to go back and modify some of the monthly spending values to meet objectives that you have set for your food plan.

a) Spending: This section shows the total cost of your new food plan and how its cost compares to the official TFP.

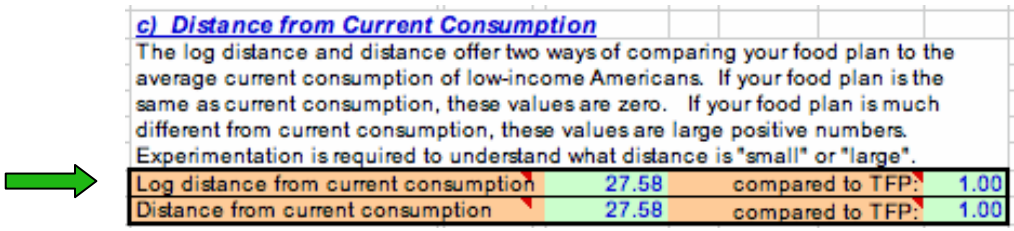
a) Spending	Your total	Percent of TFP budget	TFP budget
Total monthly spending	$118.34	100%	$118.34

b) Broad Food Categories: This section shows the amount and share of spending and the daily number of servings in each of the MyPyramid broad food categories (milk, meat and beans, grains (including whole grains), fruits, vegetables (including leafy green vegetables and orange vegetables), and other foods. Please refer to the reference worksheet MyPyramid for recommendations related to these food categories.

b) Broad Food Categories	Monthly spending per group	Percent of spending	Average daily number of servings
Milk	$18.00	15%	3.4
Meat and Beans	$29.34	25%	6.9
Grains	$19.68	17%	7.4
Whole grains	$10.61	9%	3.3
Fruits	$20.60	17%	2.2
Vegetables	$25.86	22%	3.5
Leafy green vegetables	$7.59	6%	0.4
Orange vegetables	$3.38	3%	0.5
Other	$4.86	4%	--

c) Distance from Current Consumption: This section is designed to indicate whether the food plan is likely to be "palatable" or acceptable to consumers, in the sense of not requiring too big a change from current consumption. The log distance value is determined by taking the log distance between your food plan and current consumption for each food group (for details on the TFP Optimization Model, see Appendix 2 of USDA's Report on the Thrifty Food Plan, 2006). Please note that the official USDA TFP model is subject to a number of nutrition constraints and a cost constraint. Since this Excel-based TFP Calculator allows you to create your own food plan, these additional constraints are not used in the underlying formulas of the TFP Calculator.

If the value of the log distance function is higher than the result from the official TFP, then your food plan results in a diet farther from current consumption than the official TFP. If the value of the log distance function is lower than the TFP result, then your food plan conforms more closely with current consumption patterns.

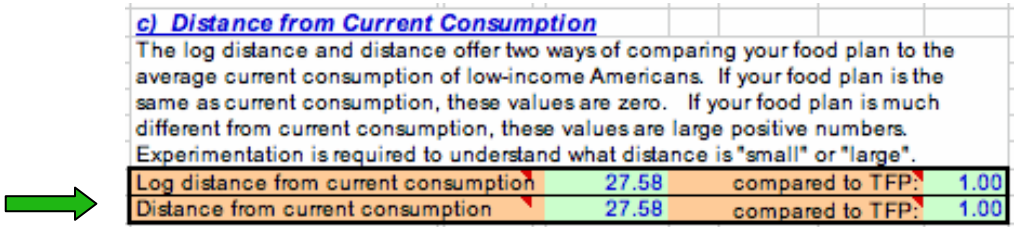


c) Distance from Current Consumption

The log distance and distance offer two ways of comparing your food plan to the average current consumption of low-income Americans. If your food plan is the same as current consumption, these values are zero. If your food plan is much different from current consumption, these values are large positive numbers. Experimentation is required to understand what distance is "small" or "large".

Log distance from current consumption	27.58	compared to TFP:	1.00
Distance from current consumption	27.58	compared to TFP:	1.00

This section also shows the distance from current consumption, as measured with a distance function. This alternative measure of distance from current consumption was included in the TFP Calculator to permit you to enter zero spending for food groups and still be able to compare your food plan to current consumption. Since the log distance function is minimizing the squared distance of the natural log of consumption, if any entry is zero, the function is undefined. Interpretation of this distance function is the same as for the log distance function, where a smaller value represents a food plan that is closer to current consumption.



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d) Energy: This section shows the total daily calories provided by your food plan and compares it to the calorie recommendation for the selected gender-age range.

d) Energy

	Calories	Percent of recommended calories	Recommended calories
Average daily calories	2411	104%	2310

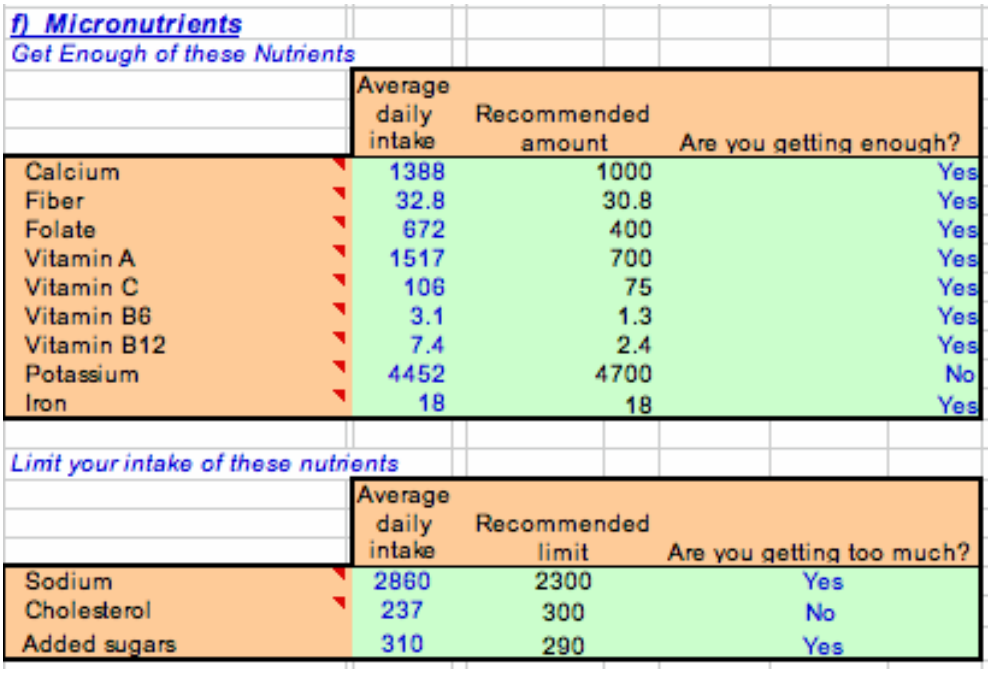
e) Macronutrients: This section shows the total daily grams of each of the macronutrients (total fat, saturated fat, linoleic acid, linolenic acid, carbohydrates, protein), the percent of calories from each macronutrient, and the recommended proportions for each (based on the Acceptable Macronutrient Distribution Ranges).

e) Macronutrients

	Daily grams	Percent of total calories	Recommended range
Fat	86	32.0%	20% to 35%
Saturated fat	23	8.7%	0% to 10%
Linoleic acid	21	8.0%	5% to 10%
Linolenic acid	2	0.72%	0.6% to 1.2%
Carbohydrates	321	53.2%	45% to 65%
Protein	103	17.1%	10% to 35%

f) Micronutrients: This section shows the total amounts of selected micronutrients, along with the recommended amounts and an indication of whether the nutrient targets

are met or not. The TFP Calculator currently displays the results for calcium, fiber, folate, vitamins A, C, B6 and B12, potassium, iron, sodium, cholesterol and added sugars. Since the underlying data on all model constraints exists in the TFP Calculator file, all the constraints are evaluated, but only a selection of them are displayed on the front sheet due to space limitations.



f) Micronutrients

Get Enough of these Nutrients

	Average daily intake	Recommended amount	Are you getting enough?
Calcium	1388	1000	Yes
Fiber	32.8	30.8	Yes
Folate	672	400	Yes
Vitamin A	1517	700	Yes
Vitamin C	106	75	Yes
Vitamin B6	3.1	1.3	Yes
Vitamin B12	7.4	2.4	Yes
Potassium	4452	4700	No
Iron	18	18	Yes

Limit your intake of these nutrients

	Average daily intake	Recommended limit	Are you getting too much?
Sodium	2860	2300	Yes
Cholesterol	237	300	No
Added sugars	310	290	Yes

Feedback and Correspondence

We are very interested to learn about your experience using the TFP Calculator. Please take the time to give us your thoughts and feedback by completing a brief survey about the TFP Calculator, available at:

http://www.surveymonkey.com/s.aspx?sm=edqHjvUJtioNbPir6UPtHg_3d_3d

We also encourage you to share the details of your food plan with us. If you would like to do so, after you have made changes to the Excel file (reflecting your policy goals and priorities), please save a copy of the file to your hard drive and send the file as an email attachment to Parke.Wilde@tufts.edu. If you developed more than one food plan, feel free to send additional files. Please feel free to include comments about your food plan or about the TFP Calculator in your email.

Acknowledgements

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References

U.S. Department of Agriculture. MyPyramid Food Guidance System. 2005. Available at www.mypyramid.gov/index.html. Accessed on July 15, 2008.

U.S. Department of Agriculture. Thrifty Food Plan, 2006. Washington, DC: Center for Nutrition Policy and Promotion; April 2007. Available at www.cnpp.usda.gov/Publications/FoodPlans/MiscPubs/TFP2006Report.pdf. Accessed on July 15, 2008.

Software

The TFP Calculator was tested using the following:
Microsoft Excel 2007 for Windows
Microsoft Excel 2004 for Mac, Version 11.5
Microsoft Excel 2003 for Windows
Microsoft Excel 97 for Windows