Try it yourself!

(on a device with Excel)

https://sites.tufts.edu/tfpcalculator/



Updated Interactive Thrifty Food Plan (TFP) Calculator: Design a Food Plan Using Your Own Criteria for Cost and Health

Abstract

The Thrifty Food Plan Calculator is a simple Excel-based tool that allows you to create your own TFP-style model diets. The calculator uses nearly the same price, food composition, consumption, and dietary guidance data as USDA's 2021 TFP update. After entering your model diet's daily calorie consumption for 97 modeling categories and selecting an age-sex demographic group and cost reference period, the calculator will show how your model diet compares to the official TFP model diet in relation to daily cost, food group, energy and nutrient requirements, and distance from current consumption.

Policy Importance

At a time when large cuts to SNAP benefits are being considered in the U.S. Congress, the TFP Calculator may be used to understand and assess the adequacy of the maximum SNAP benefit under varying assumptions about prices, nutrition standards, and consumer preferences.

The TFP is the model diet USDA uses to determine the maximum benefit for the Supplemental Nutrition Assistance Program (SNAP), the largest and most important food security and antihunger program in the United States. The TFP is developed using a mathematical algorithm that identifies a food consumption bundle that is as similar as possible to the average current consumption of a healthy-eating population, while still meeting cost and nutrition constraints (Wilde and Llobrera, 2009; USDA, 2021; Zhao et al., 2025).

Historically, updates to the TFP in 1999 and 2006 left the real (inflation-adjusted) value of the SNAP maximum benefit unchanged. However, in the most recent update in 2021, USDA researchers concluded that the previous cost constraint was insufficient to purchase an adequate diet while meeting nutrient requirements and dietary guidelines. As a result, they increased the cost target until an adequate diet became feasible, leading to an average 21% increase in the SNAP maximum benefit (USDA, 2021). The real-world policy impact of the 2021 update was greater than any previous update, sparking enormous public interest in understanding how the TFP is developed (Government Accountability Office, 2022; USDA, 2021; Zhao et al., 2025).

Background: USDA's Thrifty Food Plan (TFP) Model Considers Tradeoffs Between Preferences and Cost

For the TFP, USDA uses an optimization model that seeks to minimize the value of an **objective function**, representing the distance between a hypothetical model diet and current average consumption for a healthy eating population (Zhao et al., *Food Policy*, 2025). The idea is that a smaller distance may indicate a diet that is more familiar and perhaps more preferred.

To understand how different **constraints** affect the model, consider 4 scenarios (for adult women) with different combinations of the constraints and different cost implications:

- **Cost and food energy constraints.** The model diet must provide sufficient food energy (calories). Lowest cost.
- Cost, food energy, and nutrient constraints. In addition, the model diet must meet nutrition recommendations based on Dietary Reference Intakes (DRIs). Second-lowest cost.
- Cost, food energy, nutrients, and food group constraints. In addition, the model diet must include a diverse set of fruits, vegetables, grains, dairy, and meats, as recommended by the Dietary Guidelines for Americans (DGAs). Higher cost.
- Cost, food energy, nutrients, food group, and practicality constraints. In addition, the model diet must satisfy USDA's more idiosyncratic practicality constraints, such as limiting breakfast foods, eggs, beans, and lentils, guiding the solution toward other substitutes. This approach was used in USDA's official TFP. Highest cost.

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How to Use the TFP Calculator

Choose Your Inputs

	select a de	mographic group				
			Age-Sex Demographic Group			
			Female, 20-50yrs			
		Description	Your Model Diet			
		LND - Low Nutrient Density	Daily Calories Daily Cost		Cost	
ID	Modeling Categories	HND- High Nutrient Density	kcal	%	\$	%
	<u> </u>	Total	1206.1	100.0	4.79	100.0
1	BEPELE	Beans, peas, lentils	19.8	1.6	0.04	0.8
2	BEV_COFTEA_LND	Coffee & Tea, LND	13.0	1.1	0.05	1.0
3	BEV_COFTEA_HND	Coffee & Tea, HND	1.4	0.1	0.07	1.4
4	BEV_DIET	Diet beverages (*zero calories, not editable)	0.0	0.0	0.00	0.0
5	BEV_FRT_HND	Fruit drinks - HND	0.2	0.0	0.00	0.0
6	BEV_FRT_LND	Fruit drinks - LND	6.3	0.5	0.02	0.4
7	BEV_OTHER	Milk substitutes, nutr. beverages, smoothies	37.0	3.1	0.21	4.4
8	BEV_SODA	Soft drinks	40.2	3.3	0.14	3.0
9	BISC_MUFF	Biscuits, muffins, quick breads	27.0	2.2	0.07	1.4
						-
					·	
94	VEG_REDORAN_HICOST	Red orange vegetables	3.9	0.3	0.09	1.9
95	VEG_REDORAN_LOCOST	Red orange vegetables	4.5	0.4	0.03	0.7
96	VEG_STARCHY_LOCOST	Starchy vegetables	5.0	0.4	0.02	0.3
97	VEG_STARCHY_HICOST	Starchy vegetables	5.6	0.5	0.03	0.6
			↑			

enter your chosen quantities for 97 modeling categories

(choos (ł
Age-Sex Demographic Group	
Female, 20-50yrs	
	N.
Cost (\$)	
	N
Vegetables (cup eq)	You
Dark-Green Vegetables	
Red/Orange Vegetables	
	You
Calories (kcal)	
Fat (g)	YO
Saturated Fat (g)	
19-2 Lipplois Acid (s)	•
Distance fr	om Current
Your Model Diet	
TFP Model Diet	





Understanding the Data

Transparency is a key feature of the TFP. USDA publicly shares its data, programming details, and methodologies (Government Accountability Office, 2022; USDA, 2021; Zhao et al., 2025).

Our TFP Calculator provides reference worksheets with information about the data:

- **Common Foods Worksheet.** Detailed descriptions of the 97 TFP modeling categories. The Common Foods worksheet provides additional definitions for TFP categories labeled with "HND" (higher nutrient density) or "LND" (lower nutrient density) at the end of their names. This can help you select the appropriate TFP categories when considering the types of foods you are including in your model diet.
- Sources of Nutrients Worksheet. Detailed information on the nutritional composition of the 97 TFP modeling categories. The Sources of Nutrients worksheet displays the average cost and nutrient composition of macronutrients, food groups, and selected micronutrients for each TFP category. You can use the filtering feature to identify which TFP categories provide the most or least of a given nutrient, either by cost (nutrient per dollar) or by calorie (nutrient per 1,000 kcal). For example, to address the challenge of meeting a nutrient or food group reference while increasing total calories of your model diet, you can click the filter arrow under the "per 1,000 kcal" title for the nutrient or food group of interest. This will display TFP categories that provide the highest amount of that nutrient per unit of food energy.
- Inflation. A pull-down menu allows you to select alternate methods of adjusting for price inflation.



The TFP Calculator offers insights into how the USDA calculates the TFP model diet. By exploring the calculator, you can understand the various cost and nutritional constraints that must be met when calculating the TFP, including meeting dietary recommendations for food groups and other common micronutrients. You can also explore which modeling categories the TFP relies on the most for daily caloric intake to minimize the daily cost per person.

The nutrient composition and price for each of the 97 TFP modeling categories are averaged across all the foods in that category. For example, the model uses the average price and nutrients per 100 grams of all the fruits in the modeling category "Fruit_HND_HICOST" (ID 23), such as grapes, blueberries, strawberries, mangoes, and pineapple. In the real world, these fruits have different prices and nutrient characteristics. As a result, the TFP Calculator is best used for understanding the tradeoffs across different TFP modeling categories, rather than between individual foods within the same TFP modeling category.

• **Pescatarian diets:** Similarly, what if you remove meat and incorporate more fish and seafood?

foods?



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What You Can Accomplish Using This Calculator

You can use this calculator to explore how dietary shifts may influence a target population's ability to meet the TFP cost and nutrient constraints. Some examples of dietary shifts include:

• Plant-based or vegetarian diets: If you reduce or eliminate meat and increase plant-based protein sources such as legumes, and nuts, how does this affect your target population's ability to meet both cost and micronutrient constraints? Which modeling categories did you use to provide the most daily calories, and how did they help you stay within the TFP cost constraint?

• Lactose-free and gluten-free diets: Or, what if you eliminate lactose and gluten-containing

You also can explore changes in the cost constraint:

• **Cutting SNAP benefits:** With a lower cost constraint, you can explore what model diet still could be affordable, reflecting your own sense of what "adequate" really means.

Increasing SNAP benefits: Or, with a more generous cost constraint, you can explore diets that are healthier and more similar to current consumption patterns, perhaps better satisfying consumer preferences.



Sources

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This work was supported by USDA NIFA #2021–67023-34479. Our funding sources were not involved in the study design, collection, analysis, or interpretation of the data. The views expressed in this paper are of the authors and should not be attributed to USDA. We thank Joseph Llobrera and Flannery Campbell for contributions to the 2009 and 2014 editions of the calculator.