



U.S. DEPARTMENT OF AGRICULTURE

# Measuring the Cost of a Thrifty Food Plan in Puerto Rico



Final Report



# Measuring the Cost of a Thrifty Food Plan in Puerto Rico

## Final Report

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# Contents

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Executive Summary .....	i
A. Background .....	i
B. Approach.....	i
C. Options for Measuring the Cost of a TFP in Puerto Rico .....	i
Chapter 1. Introduction .....	1
A. Statement of the Problem .....	1
B. Study Approach .....	2
C. Description of the Current Mainland TFP .....	4
D. Overview of Options for Measuring the Cost of a TFP in Puerto Rico .....	5
Chapter 2. Cost Adjustment to the Mainland TFP .....	7
A. Options for Cost-of-Food Adjustment .....	7
B. Updates to Market Basket Costs Using IRI InfoScan Data .....	11
Chapter 3. Food Intake Data .....	13
A. Use of Food Intake Data in the TFP Model .....	13
B. Options for Food Intake Data .....	14
Chapter 4. Food Price Data .....	19
A. Use of Food Price Data in the TFP Model .....	19
B. Options for Food Price Data .....	19
Chapter 5. Final Considerations .....	25
A. Cross-Analysis of Options and Recommendations .....	25
B. Implications for Other Outlying Areas .....	27
References .....	29
Appendix A. Study Approach and Study Group Members .....	A-1
Appendix B. Dismissed Options for Measuring the Cost of a TFP in Puerto Rico .....	B-1

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## Executive Summary

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In September 2020, in response to a Congressional Directive, the U.S. Department of Agriculture's (USDA) Center for Nutrition and Policy Promotion (CNPP) contracted with Insight Policy Research (Insight) to conduct the Measuring the Cost of a Thrifty Food Plan (TFP) in Puerto Rico study. The purpose of the study is to provide CNPP with options for measuring the cost of a TFP in Puerto Rico.

### A. Background

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CNPP maintains four food plans that represent a nutritious diet for home consumption at four different cost levels: Thrifty, Low Cost, Moderate Cost, and Liberal (USDA, 2021a). The plans differ in types and quantity of foods for 15 age-sex groups, each with a corresponding specific market basket. Each market basket represents a selection of foods that align with USDA dietary recommendations, food prices, and typical food intake. The TFP is used as the basis for setting the maximum Supplemental Nutrition Assistance Program (SNAP) allotment and represents a healthy, practical, cost-effective diet (USDA, 2021b).

Currently, there is no TFP for Puerto Rico. Puerto Rico identifies its benefit levels for the Nutrition Assistance Program (NAP) based on available block grant funding per participant. Benefit levels are approved by the Food and Nutrition Service annually. Developing a TFP that reflects food intake patterns and food prices in Puerto Rico would be one step toward implementing SNAP in the territory (Trippe et al., 2015). However, the methodology used in the mainland United States cannot be easily applied to Puerto Rico. To create a Puerto Rico TFP, new data will need to be collected or the approach to construct a TFP will need to be modified.

### B. Approach

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To identify options for measuring the cost of a TFP in Puerto Rico, the study team conducted an environmental scan, convened an expert study group for two meetings, conducted interviews with subject matter experts, and synthesized information across sources. The expert study group was composed of researchers and economists from the mainland United States and Puerto Rico, who were selected for their knowledge of the TFP, relevant methodological expertise, familiarity with proposed data sources, and understanding of food and nutrition issues in Puerto Rico.

### C. Options for Measuring the Cost of a TFP in Puerto Rico

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The study team narrowed the options for measuring the cost of a TFP in Puerto Rico through an iterative process. The final options employ one of two general approaches to altering the mainland TFP for Puerto Rico. CNPP would first need to determine an approach and then select an option(s) within the approach. Although some approaches yield higher quality results than others, no approach is without its drawbacks.

- ▶ The first approach would adjust the cost of the mainland TFP market basket for the reference family of four to account for differences in food prices in Puerto Rico.
- ▶ The second approach would update the food intake and food price inputs to the mainland TFP model; CNPP would then run the optimization model and determine a set of market baskets specific to Puerto Rico. For this approach, CNPP would need to choose one of the presented options for food intake data and one for food price data.



Table ES.1 presents an overview of the options associated with each approach.

**Table ES.1. Options for Measuring the Cost of a TFP in Puerto Rico**

Option	Overview	Advantages	Disadvantages	Cost	Timeline	
Approach 1. Adjust the Cost of the Mainland TFP						
C2ER COLI	Construct a COFA using data collected by C2ER	Quick, low cost, and relatively simple	Price data are only collected from six urban vendors in Puerto Rico. There may be bias in how the COLI is calculated.	< \$1,000	< 1 month	
OPM COLA	Construct a COFA using microdata collected by OPM		Data are only collected from three urban vendors, the most recent published data are from 2004, and the study team was unable to review the microdata.	< \$1,000 + staff time	3–6 months	
IRI InfoScan data	Update market basket costs using IRI InfoScan data from retailers in Puerto Rico		There is a 1-year lag in data receipt. Data are only collected from a small sample of large, urban vendors in Puerto Rico.	< \$5,000 + staff time	3–6 months	
Approach 2. Update the Mainland Model Inputs to Create a Puerto Rico TFP						
Food Intake Data	Primary data collection from individuals	Collect food intake data from a representative sample of Puerto Ricans using two 24-hour dietary recall interviews	Most similar to the approach used for the mainland, Hawaii, and Alaska TFPs	This approach has a lengthy timeline and high costs. Challenges with participant recruitment could lead to delays.	\$1.2–1.8m	3–4 years
	Existing data and expert input	Use existing food intake data from Puerto Rico and input from an expert panel to adjust the mainland TFP food intake datasets	Most cost-effective food intake data option	The existing data have some limitations but could be supplemented to achieve greater representativeness.	\$0.3–0.4m	9–12 months
Food Price Data	IRI InfoScan data	Use existing IRI InfoScan data as the food price input to the TFP model	Most similar to the approach used for the mainland TFP and most cost-effective food price data option	There is a 1-year lag in data receipt. Data are only collected from a small sample of large, urban vendors in Puerto Rico.	< \$5,000 + staff time	3–6 months
	Primary data collection from vendors	Collect food price data from a sample of vendors across Puerto Rico	Data would be collected islandwide instead of only from urban vendors	Data collectors can only record prices for a limited set of foods.	\$0.5–0.75m	1–2 years
	Primary data collection from households	Collect food price data from a representative sample of Puerto Rican households using interviews and scanners or a smartphone application	Yields detailed household-level data with many price observations	This approach has a lengthy timeline and high costs. Challenges with participant recruitment could lead to delays.	\$1.7–2.6m	4–5 years

Note: C2ER = Council for Community and Economic Research; COFA = cost-of-food adjustment; COLA = cost-of-living adjustment; COLI = cost-of-living index; m = million; OPM = Office of Personnel Management

# Chapter 1. Introduction

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In September 2020, in response to a Congressional Directive, the U.S. Department of Agriculture’s (USDA) Center for Nutrition and Policy Promotion (CNPP) contracted with Insight Policy Research (Insight) to conduct the Measuring the Cost of a Thrifty Food Plan (TFP) in Puerto Rico study. The purpose of the study is to provide CNPP with options for measuring the cost of a TFP in Puerto Rico. This report summarizes key findings and conclusions of the assessment, and details feasible options, including the estimated timeline, associated costs, and advantages and disadvantages of each option.

## A. Statement of the Problem

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USDA began developing food plans in the 1930s to “provide consumers with practical and economical advice on healthy eating” (Carlson et al., 2007, p. 2). Currently, CNPP maintains four food plans that represent a nutritious diet for home consumption at four different cost levels: Thrifty, Low Cost, Moderate Cost, and Liberal (USDA, 2021a). The food plans differ in the types and quantity of foods for 15 age-sex groups, each with a corresponding specific market basket. The Thrifty Food Plan, the lowest cost of the four USDA food plans, is used as the basis for maximum Supplemental Nutrition Assistance Program (SNAP) benefit allotments and represents a healthy, practical, cost-effective diet (USDA, 2021b).

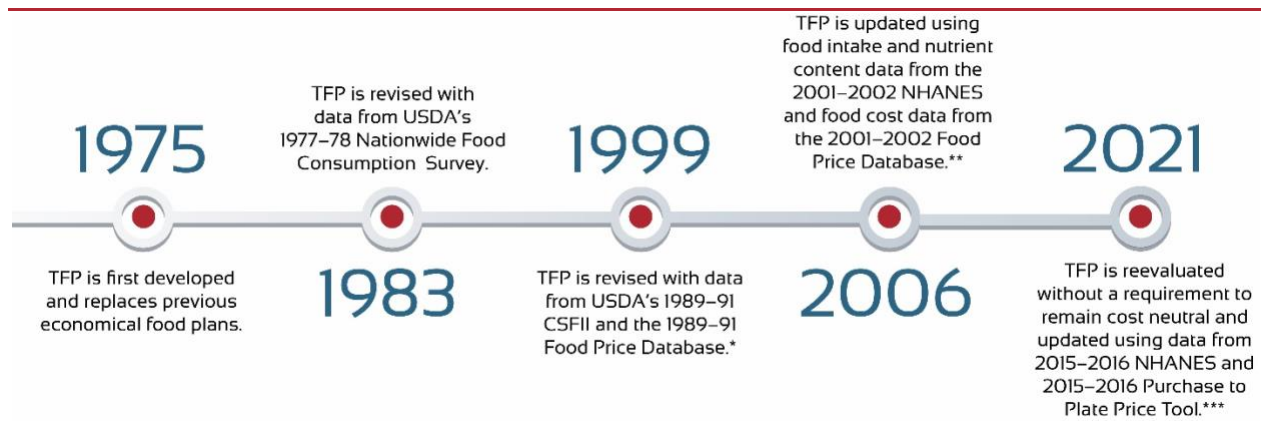
### Rationale for the Study

- Currently, there is no TFP for Puerto Rico.
- Puerto Rico determines benefit levels for its Nutrition Assistance Program (NAP) based on available funding through a block grant approved by the Food and Nutrition Service annually; benefits for NAP are substantially less than those for SNAP.
- Developing a TFP for Puerto Rico would be an important step toward implementing SNAP in the territory. As is done for SNAP benefit levels in the mainland, a Puerto Rico TFP would enable USDA to set SNAP allotment levels in Puerto Rico, should the program be implemented on the island.
- The current TFP methodology can be replicated to create a TFP for Puerto Rico with new data collection or using a modified approach.

As figure 1.1 illustrates, the TFP was first developed in 1975 and has been updated periodically since then to incorporate changes to dietary guidance and updated information on food composition, food consumption, and food prices. Prior administrative policy stipulated the TFP remain cost-neutral; therefore, since 1975, the only TFP cost updates have been monthly food-price inflation adjustments. This changed with the enactment of the Agricultural Improvement Act of 2018 (P.L.115–334, the 2018 Farm Bill) and the 2021 TFP reevaluation. The goal of the reevaluation was to create market baskets that contain a variety of lower priced, higher quality, commonly consumed foods and beverages to support healthy meals and snacks at home on a limited budget without a requirement to remain cost-neutral. Ultimately, CNPP made the 2021 updates to the mainland TFP using food intake data from the 2015–2016 National Health and Nutrition Examination Survey (NHANES), nutrient and food group profile data from the Food and Nutrition Database for Dietary Studies and the Food Pattern Equivalents Database, and food price data from the Purchase to Plate Price Tool 2015–2016, which compiles food price data from the 2015–2016 Information Resource Inc. Retail Scanner Data (IRI InfoScan).



**Figure 1.1. History of the TFP**



Note: CSFII = Continuing Survey of Food Intakes by Individuals; NHANES = National Health and Nutrition Examination Survey  
\* The 1989–91 Food Price Database was constructed by merging information from the 1989–91 CSFII on foods consumed with price data from national datasets, including ACNielsen price data.  
\*\* The 2001–2002 Food Price Database used the ACNielsen Homescan™ Panel.  
\*\*\* The Purchase to Plate Price Tool uses 2015–2016 IRI InfoScan data.

Currently, there is no TFP for Puerto Rico. Puerto Rico identifies its benefit levels for NAP based on available funding through a block grant approved by the Food and Nutrition Service annually. However, there is a precedent for CNPP developing separate TFPs for the outlying areas. In 1977, recognizing the TFP may not have been accurate for Alaska and Hawaii because of different food intake patterns and higher food prices, Congress stipulated that USDA estimate a separate TFP for these two States. Because existing data sources did not include information on Alaskan and Hawaiian households, USDA funded the collection of data in Alaska and Hawaii (through the 1977–1978 Nationwide Food Consumption Survey) to determine food intake patterns and food prices in Alaska and Hawaii (USDA, 2020) and calculated TFPs for each State in the early 1980s. The Alaska and Hawaii TFPs are updated every 6 months using the Consumer Price Index (CPI) for urban Alaska and urban Hawaii (USDA, 2020). The TFPs for Alaska and Hawaii were excluded from the 2021 revision, but a reevaluation is estimated to be completed by December 2022 (USDA, 2021b).

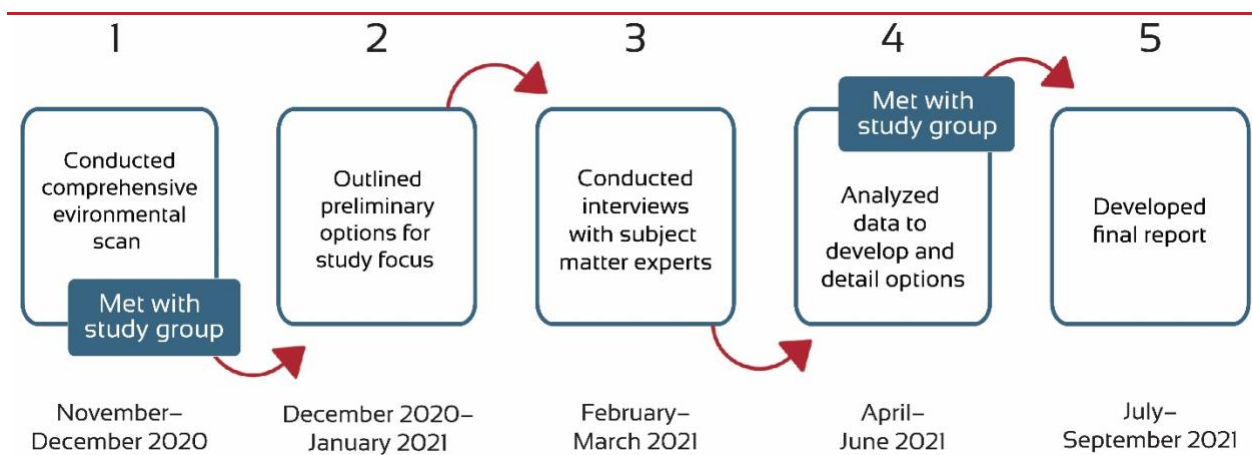
Developing a TFP that reflects food intake patterns and food prices in Puerto Rico would be one step toward implementing SNAP in the territory (Trippe et al., 2015). Because NAP is a block grant, benefits are determined based on available funding and may not reflect true food prices or food intake patterns among Puerto Ricans (Keith-Jennings & Wolkomir, 2020). As a result, SNAP benefits have typically been higher than NAP benefits. A Puerto Rico TFP would enable USDA to set SNAP allotment levels in Puerto Rico, should the program be implemented on the island, to reflect a healthy, practical, cost-effective diet. In the interim, a Puerto Rico TFP could be used to justify an increase in block grant funding and a subsequent increase in NAP benefits. However, the methodology used in the mainland United States cannot be easily applied to Puerto Rico. To create a Puerto Rico TFP, new data must be collected or the approach to construct a TFP must be modified.

## **B. Study Approach**

To identify options for measuring the cost of a TFP in Puerto Rico, the study team conducted an environmental scan, convened an expert study group for two meetings, conducted interviews with subject matter experts, and synthesized information across sources. The expert study group, composed of researchers and economists from the mainland United States and Puerto Rico, was engaged to advise

on the project from December 2020 to May 2021.<sup>1</sup> Study group members were selected for their knowledge of the TFP, relevant methodological expertise, familiarity with proposed data sources, and understanding of food and nutrition issues in Puerto Rico. See appendix A for more details on the study methods and the names and affiliations of study group members. Figure 1.2 provides an overview of the study approach.

**Figure 1.2. Overview of Study Approach**



## 1. Cost and Timeline Estimation

To support the comparison of options, the study team estimated the associated cost and timeline for each option. Cost estimates and timelines were generally informed by the study team’s extensive experience performing similar tasks and primary data collections. Cost estimates for the primary data collection options were informed by discussions and estimates obtained from local data collectors in Puerto Rico. The study team also considered the published contract values and timelines for comparable studies, with adjustments made to account for key differences between the scope and scale of the previous (or ongoing studies) and data collections proposed as options in this report. All cost estimates and timelines were developed based on a set of assumptions about who would perform the work (e.g., CNPP or an independent contractor selected through a competitive bid process) and key aspects of the methodology (e.g., proposed sample sizes, use of a smartphone app for data collection). All cost estimates are in 2021 dollars.

## 2. Study Limitations

The study has three main limitations. First, the cost estimates presented in this report are based on 2021 dollars and do not account for data collections that may take place well into the future.

Second, to the extent options are selected and executed differently than specified in this report, actual costs may be higher or lower than the presented estimated costs. However, because the proposed methods and cost estimates for the options were informed by the study team’s decades of experience conducting similar studies, actual costs are not expected to vary substantially from the estimates.

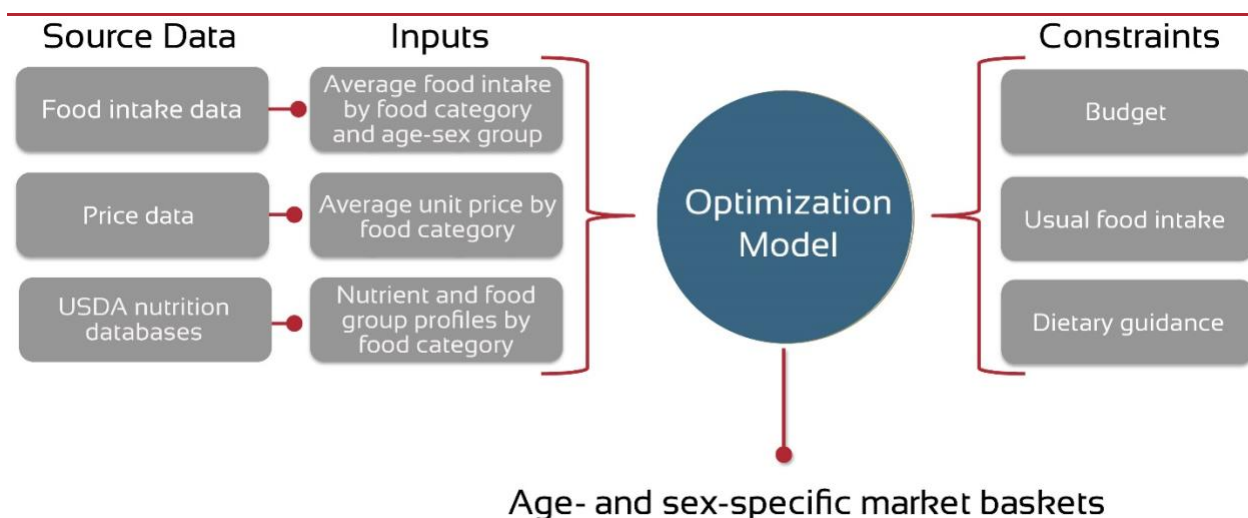
<sup>1</sup> All recommendations and feedback by the expert study group were provided prior to the August 2021 TFP revision and reflect an understanding of the TFP based on the 2006 methodology.

Third, the options presented in this report may not be an exhaustive list of the options for measuring the cost of a TFP in Puerto Rico. The study team conducted a thorough environmental scan and sought input from the expert panel to identify additional options. Still, other options for measuring the cost of a TFP in Puerto Rico may exist. Appendix B presents an overview of the options the study team considered but dismissed after further examination because they were infeasible, or the methodology was unsound.

## C. Description of the Current Mainland TFP

CNPP developed the current (2021) mainland TFP using the same optimization model used for previous editions of the TFP, with updates to the model’s data sources, inputs, and constraints. Specifically, CNPP sourced updated food intake and price data from existing databases, created 65 food and beverage categories (i.e., groupings of foods and beverages based on similar usage in the mainland United States and by similar nutrient content and price; referred herein as “food categories”), and established the inputs and constraints for a mathematical model designed to optimize the food market baskets.<sup>2</sup> The model consists of three sets of data inputs that relate to each of 65 food categories and is subject to three sets of constraints (see figure 1.3). The food intake input and the dietary constraints in the model account for an estimated 5 percent food waste. Separate models were run to establish 15 market baskets in all—one for each of 15 specific age-sex groups.<sup>3</sup> Each of the 15 market baskets consists of 24 market basket categories; the food category inputs, which align with foods reported as-consumed in NHANES, are converted into market basket categories in as-purchased forms.

**Figure 1.3. Depiction of the TFP Methodology and Optimization Model**



Note: This figure is a simplified version of the mainland TFP methodology and optimization model. For a detailed depiction, see figure 1 in the *Thrifty Food Plan, 2021* technical report, <https://www.fns.usda.gov/resource/thrifty-food-plan-2021>.

<sup>2</sup> The average price for each food category is based on the average unit price of each item in the food category weighted by consumption share among individuals belonging to households with incomes below 350 percent of the Federal Poverty Guidelines. Thus, food items typically consumed have a greater effect on the average food category price. Outlier prices were excluded, and 30 of the 65 food categories were separated into lower- and higher-price categories. As a result, the TFP market baskets emphasize lower price items: those items with prices below the 35th percentile of price within their respective food categories.

<sup>3</sup> Children aged 1, 2–3, 4–5, 6–8, and 9–11; females aged 12–13, 14–19, 20–50, 51–70, and 71 and older; and males aged 12–13, 14–19, 20–50, 51–70, and 71 and older

## D. Overview of Options for Measuring the Cost of a TFP in Puerto Rico

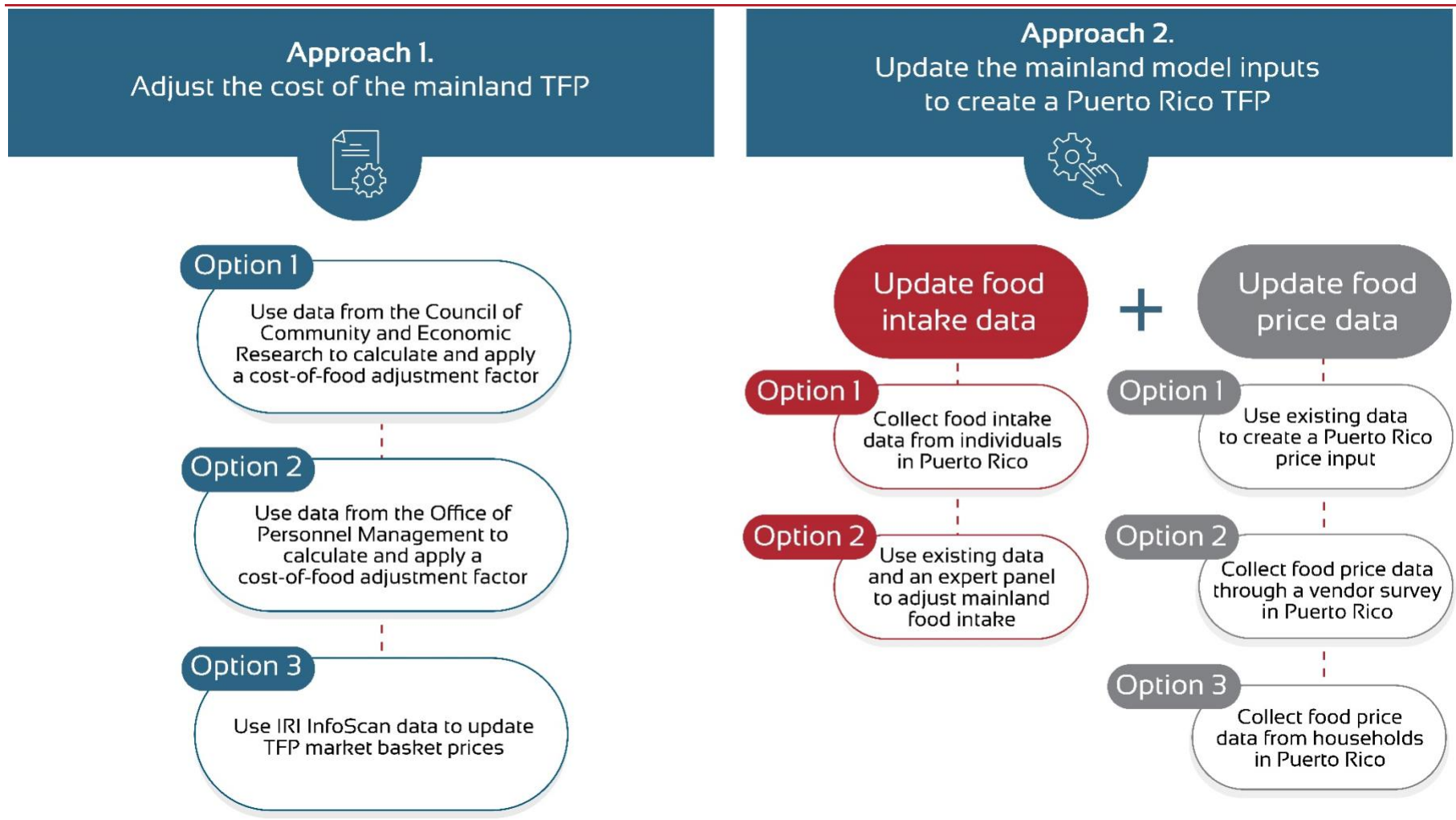
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Through an iterative process, the study team considered, narrowed, refined, and selected a set of options for measuring the cost of a TFP in Puerto Rico. Appendix B briefly describes data sources the study team examined but eliminated from further consideration because of substantial limitations. The final options this report describes relate to the mainland TFP and employ one of two general approaches. CNPP would first need to determine an approach and then select an option(s) within the approach.

- ▶ **Approach 1** entails adjusting the cost of the mainland TFP market basket for the reference family of four to account for differences in food prices in Puerto Rico. Chapter 2 discusses three options that could be used for this purpose.
- ▶ **Approach 2** entails updating the food intake and food price inputs to the mainland TFP model; CNPP would then run the optimization model and determine a set of market baskets specific to Puerto Rico. Chapter 3 discusses two options for creating a Puerto Rico-specific food intake input. Chapter 4 discusses three options for creating a Puerto Rico-specific food price input. For this approach, CNPP would need to choose one of the presented options for food intake data and one for food price data. Ultimately, to create market baskets that are fully relevant and optimized for Puerto Rico, both the food intake and food price inputs would need to be updated over time.

Figure 1.4 provides an overview of the options discussed in chapters 2–4. For approach 2, options are listed in order of their similarity to the mainland TFP methodology. Chapter 5 triangulates information across the three main report chapters and presents final considerations for selecting a set of options to measure the cost of a TFP in Puerto Rico.

Figure 1.4. Overview of Options for Measuring the Cost of a TFP in Puerto Rico





## Chapter 2. Cost Adjustment to the Mainland TFP

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The quickest and lowest cost approach for measuring the cost of a TFP in Puerto Rico is to adjust the cost of the mainland TFP for a reference family of four to account for differences in food prices between the mainland and Puerto Rico. The study team has identified three options to adjust the cost of the TFP: (1) use data from the Council for Community and Economic Research (C2ER) to construct a cost-of-food adjustment (COFA), (2) use microdata from the Office of Personnel Management (OPM) to construct a COFA, and (3) use IRI InfoScan data to update market basket category prices. Section A presents an overview of the COFA options (i.e., C2ER and OPM), and Section B presents the IRI data option.

### Key Considerations for a Cost Adjustment

Though this methodology is quick, low cost, and would account for differences in prices, it would not account for differences in food intake between Puerto Rico and the mainland. For this reason, the expert study group did not recommend it as a method to determine the cost of the TFP in Puerto Rico.

It is important to note that none of these options would account for differences in food intake between the mainland United States and Puerto Rico, only food prices (see chapter 3, section A for further details on the importance of using Puerto Rico-specific food intake data for the purposes of the TFP). This is a severe limitation of this approach and the reason the expert study group did not recommend it. However, under time and cost constraints, these would be feasible options for determining the cost of a TFP in Puerto Rico.

### A. Options for Cost-of-Food Adjustment

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This section presents an overview of two options for a COFA that could be applied to the cost of the mainland TFP.

#### 1. C2ER Cost-of-Living Index

C2ER is a membership organization that has promoted local and economic research since 1961 (C2ER, n.d.). Since 1968 it has published a quarterly cost-of-living index (COLI) report, which is recognized by Federal agencies, including the U.S. Census Bureau and U.S. Bureau of Labor Statistics (C2ER, 2017). The index facilitates comparisons of the cost of living between metropolitan areas at a single point in time. Data collection and reporting are exclusive to urban areas; 269 cities were included in the COLI report in 2020, including one city in Puerto Rico, San Juan. The Puerto Rico grocery index is based on data from only six establishments, which were purposely selected and recruited.<sup>4</sup> Data collection is primarily conducted in person by volunteer data collectors who visit establishments and record per-unit prices for specific items, including sale, discount, and bargain prices.<sup>5</sup> Quarterly reports are published for three quarters each year. Before 2011, the U.S. Census Bureau published C2ER's annual report in the *Statistical Abstract of the United States*; this product was discontinued in 2011.

The data included in the quarterly COLI reports would facilitate the development of an adjustment factor that could be used to approximate the total cost of the TFP in Puerto Rico. This methodology has three main benefits: (1) it is low cost; (2) it does not require collecting new data; and (3) it would

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<sup>4</sup> The location and size of establishments surveyed in Puerto Rico are unpublished.

<sup>5</sup> Some price data are also collected over the phone and by mail.

facilitate annual updates to the cost of the TFP in Puerto Rico to reflect future variation in relative food prices.

### **Approach**

The C2ER COLI is calculated from a weighted average of six category-level indices: grocery items, housing, utilities, transportation, healthcare, and miscellaneous goods and services. To create an adjustment factor that would reflect differences in food prices in Puerto Rico compared with the mainland United States, CNPP could use the underlying average prices and weights C2ER uses to calculate the grocery index in San Juan, Puerto Rico, and apply them across the island. C2ER provides values for the 24 food items in the grocery index.<sup>6</sup> CNPP would be able to calculate a custom grocery index composed of only food items by removing the nonfood items and reweighting the remaining food components. CNPP would then calculate an adjustment factor that would equal the value of this custom grocery index in the San Juan metropolitan area divided by the average custom grocery index value in the mainland United States. This custom adjustment factor would then be multiplied by the cost of the mainland TFP to determine the cost of the TFP in Puerto Rico.

### **Costs and timeline**

C2ER publishes several COLI-related data products. The main adjustment factor C2ER creates reflects city-to-city differences in prices for “professional and managerial households in the top income quintile” (C2ER, 2017). To estimate the differences in food prices between SNAP-eligible populations in Puerto Rico and the U.S. mainland average, the study team recommends using the Excel Expanded Edition of the COLI quarterly report to subset the data and take advantage of weights reflecting households in one or more of the lower income quintiles. The Excel Expanded Edition costs \$150 for a single-issue subscription (\$350 for a 1-year subscription). Only the first and third quarter reports would be needed to produce semiannual updates to the Puerto Rico TFP, which could be released alongside the Alaska and Hawaii TFPs. As a result, the cost of acquiring these data would be \$300 per year. The study team was able to obtain the data from C2ER within the span of a few days and estimates it would take CNPP no longer than 2 weeks to acquire the data once funds were made available.

In addition to the cost of the data, CNPP staff would need to analyze the data and complete the calculations required to compute a custom grocery index for Puerto Rico. The study team estimates CNPP staff would require less than 1 month and approximately 20–30 hours of staff time to complete this task. The process would need to be repeated yearly with the release of new data from C2ER. Annual updates would require a lower level of effort as a result of efficiencies once methods and data analysis programs were established. See chapter, 1 section B for more information on cost and timeline estimation.

### **Considerations**

The C2ER COLI data are low cost, readily available, and include prices directly observed in the Puerto Rican food retail environment. However, using these data to estimate the cost of the TFP in Puerto Rico would require some significant caveats.

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<sup>6</sup> C2ER’s grocery index includes 26 items, but 2 are not food and should be excluded from a food-specific COLI: dishwasher detergent and facial tissues.

First, based on available information, the study team is uncertain about the potential for bias in the C2ER COLI. C2ER advises against interpreting the COLI as describing *exact* price differences between geographic areas because of the uncertain impact of response error.

The Puerto Rico index is based on data from only six vendors in the San Juan metropolitan region. Because the location and size of establishments surveyed are unpublished, the level of precision and representativeness of the sample of the average price estimates is therefore uncertain. Additionally, because only data from urban vendors are collected, the adjustment factor would be biased if the variation between urban and rural food prices is different in Puerto Rico than the mainland.

The C2ER COLI is designed to represent prices paid by moderately affluent professional and managerial households in the top income quintile in different markets. The 2021 mainland TFP model weights food prices using food intake data from households with income at or below 350 percent of the Federal poverty guidelines (FPG). While it is unclear what income levels fall within the top income quintile in Puerto Rico and how these incomes relate to the FPG, it is possible the C2ER COLI may overrepresent purchasing patterns of higher income individuals in comparison to the mainland TFP.

Additionally, C2ER weights each food item included in the grocery component index based on the relative contribution of the item to total expenditures on food items based on the U.S. Bureau of Labor Statistics 2007 Consumer Expenditure Survey. The C2ER methodology assumes the weight of each item is constant across all locations. However, the food items included in the C2ER COLI and the weights derived from the Consumer Expenditure Survey may not be representative of the food environment in Puerto Rico.

Lastly, C2ER provides national average index values in its published reports, which serve as a straightforward comparison to values specific to Puerto Rico. However, these national averages are simple averages of the metropolitan area-specific results and may need to be refined to account for variation in population sizes across metropolitan areas and/or selection bias resulting from unsampled metropolitan areas.

## 2. Office of Personnel Management COLA

OPM conducts living-cost surveys in the outlying areas, including Puerto Rico, and in the Washington, DC, area every 3 years<sup>7</sup> to determine the extent to which the cost of living differs between each area and the Washington, DC, region.<sup>8</sup> Data collectors observe in-store unit prices of several categories of food. For consistency, food prices are collected only at grocery stores. Similar to the C2ER data, OPM food price data collected for Puerto Rico are limited to the San Juan metro area; survey attempts are made in a purposive sample of three supermarkets, to the extent practical.

### Approach

OPM published detailed results from the initial living-cost survey conducted in Puerto Rico in 2004, including price comparisons between Puerto Rico and Washington, DC, at the food category level (OPM, 2004). Food category weights were derived from the Consumer Expenditure Survey and intended to represent spending patterns of middle-income groups in Washington, DC. While alcoholic beverages and

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<sup>7</sup> OPM adjusts price indexes between the triennial surveys using the annual or biennial change in CPI for the COLA area relative to the annual or biennial change in the CPI for the Washington, DC, area.

<sup>8</sup> 5 CFR §591.223

food away from home are included in the overall food component, these items could be removed, and the categories could be reweighted to reflect only foods at home relevant to the TFP.

The underlying data collected by OPM could be used to create an adjustment factor for a Puerto Rico TFP. To create the adjustment factor, CNPP would need access to the OPM microdata because the individual food price observations (i.e., microdata) and subcategory-specific unit prices were not included in the publicly available reporting. The study team was unable to acquire the microdata within the study period.

Because the 2004 living-cost survey compared Puerto Rico with the Washington, DC, metro area rather than the mainland U.S. average, the survey results would need to be combined with additional data to ascertain the relative price difference between Puerto Rico and the U.S. average for each food category<sup>9</sup> in the living-cost survey. CNPP would first need to use an external data source, such as the IRI InfoScan data (see chapter 2, section B and chapter 4, section B), to update the index values to reflect a U.S. average, rather than food prices in Washington, DC. Next, CNPP could calculate an adjustment factor for the TFP as the average of the updated OPM index values weighted by the living-cost survey category expenditure shares in Puerto Rico. Lastly, the cost of the TFP in the mainland United States would need to be multiplied by this adjustment factor to determine the total cost of the TFP in Puerto Rico.

### Costs and timeline

The study team does not anticipate any costs associated with gathering the OPM data.<sup>10</sup> There are three main considerations regarding the timeline: (1) the time necessary to obtain microdata from OPM; (2) the time necessary to obtain IRI data; and (3) time needed by CNPP staff to compare food prices in Puerto Rico with the mainland U.S. average and calculate the adjustment factor. The team estimates obtaining the microdata from OPM would likely require 2–3 months, unless CNPP already has a point of contact at OPM who can locate and provide timelier access to the required microdata. The team estimates a similar timeline for obtaining IRI InfoScan data (see chapter 2, section B). After acquiring all necessary data, the study team estimates that CNPP staff would need an additional month to adjust the OPM data and calculate the adjustment factor. In all, this option would take approximately 3 to 6 months. See chapter 1, section B for more information on cost and timeline estimation.

### Considerations

This approach presents several key considerations. First, OPM has not published results from more recent surveys. While there is no indication OPM has changed its methodology for collecting the data and constructing the final COLA since 2004, the study team could not confirm this because more recent data have not been published in the *Federal Register*. For this reason, the study team hesitates to fully recommend the use of an OPM COLA.

There are several other limitations to using this approach. First, because the OPM data are primarily used to determine necessary differences in salaries between Federal employees residing in the metro Washington, DC, area and another area, collected data are representative of the spending patterns of middle-income individuals.

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<sup>9</sup> Relevant food categories in the OPM living-cost survey include cereals and bakery products; meats, poultry, fish, and eggs; dairy products; fruits and vegetables; processed foods; nonalcoholic beverages; and other food at home.

<sup>10</sup> CNPP would face costs associated with accessing the IRI InfoScan data. See chapter 3, section B and chapter 4, section A for a detailed description of these costs.

Additionally, OPM has not published the number, location, and size of establishments surveyed. Therefore, the level of precision and representativeness of the sample and the average price estimates is uncertain. The OPM data are also limited to the San Juan metropolitan area. As a result, the adjustment factor would be biased if the variation between urban and rural food prices is different in Puerto Rico than in the mainland United States.

Lastly, the food items included in the survey and the weights derived from the Consumer Expenditure Survey may not be representative of the food environment in Puerto Rico.

## **B. Updates to Market Basket Costs Using IRI InfoScan Data**

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IRI InfoScan data capture retailer point-of-sale records of consumer food purchases and include data from retailers in Puerto Rico and the mainland United States. These data could be used to update mainland TFP market basket costs for the reference family of four to reflect food prices in Puerto Rico.

### **1. Approach**

Average food prices in Puerto Rico could be calculated from IRI InfoScan data using the Purchase to Plate Price Tool (PPPT).<sup>11</sup> The PPPT enables users to estimate as-consumed and as-purchased prices for foods reported as consumed by NHANES participants (Carlson et al., 2020). As-purchased average prices for each food and beverage could then be clustered into the 24 market basket categories, or groups of foods and beverages that align with the Dietary Guidelines for Americans 2020–2025.

CNPP would first need to use IRI InfoScan data from vendors in Puerto Rico and the PPPT to determine the cost of each market basket category for each age-sex group represented in the TFP reference family (male aged 20–50, female aged 20–50, child aged 6–8, and child aged 9–11). The market basket category costs would then need to be summed to determine the total cost of the TFP in Puerto Rico.

### **2. Costs and timeline**

USDA Economic Research Service (ERS) currently purchases InfoScan data from IRI. If CNPP were to move forward with this approach, it would need to request access to the data and complete an agreement noting which data were needed and how the data would be used. IRI would then generate a third-party agreement, and CNPP would gain access to the IRI data through the National Opinion Research Center (NORC) Data Enclave.

The IRI InfoScan data would be available through the NORC Data Enclave to the primary investigator for \$4,350, and each additional NORC account would cost \$2,250. Acquiring access to the IRI InfoScan data would take approximately 4 weeks for a USDA employee. The previous year's data typically become available to ERS in the early summer and are available to users in early fall. The estimated timeline for this option would be 3–6 months, including gaining access to the IRI data and creating the adjustment. However, delays in ERS obtaining IRI data or a need to wait for more recent data could extend the timeline. Likewise, the timeline could be reduced if CNPP already has access to IRI InfoScan data for all required users. See chapter 1, section B for more information on cost and timeline estimation.

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<sup>11</sup> For further details regarding the Purchase to Plate Price Tool, see <https://www.ers.usda.gov/webdocs/publications/99295/tb-1955.pdf?v=9359.6>.



### 3. Considerations

The primary advantage of using the IRI InfoScan data to update food prices is that the same data source is used to determine food prices for the mainland TFP. IRI InfoScan data in Puerto Rico are subject to similar limitations as mainland IRI data, including potential lack of representativeness of participating vendors and limited information on private label brands from certain large retailers.

While the mainland TFP captures prices from the 48 contiguous States and Washington, D.C., a Puerto Rico TFP would rely on price data from a relatively small number of vendors in Puerto Rico and could lead to potential bias in food prices if, for example, food prices for certain items were only observed for one or two vendors. In addition, the IRI InfoScan data from Puerto Rico only include transactions from the San Juan metropolitan area; IRI InfoScan data for the mainland include both urban and rural transactions. A comparison of average food prices between the mainland and Puerto Rico could be confounded by urbanicity.

Lastly, to date, the PPPT has only been validated for national average prices; it has not yet been tested for producing region, State, or territory-specific average prices. Additional exploration of the limitations of the PPPT for this use case is advised before final implementation.

## Chapter 3. Food Intake Data

One component of the TFP optimization model is information about the usual food intake of mainland resident adults and children. The food intake data are drawn from What We Eat in America (WWEIA),<sup>12</sup> the dietary intake component of NHANES, and aggregated into 65 food categories and 15 age-sex groups. The study team identified two options CNPP could use to create food intake datasets for use in a Puerto Rico TFP:

(1) collect new data from individuals in Puerto Rico, and (2) use existing data and expert input to adjust mainland food intakes. Section A presents an overview of the importance of Puerto Rico-specific food intake data to calculate the cost of a TFP in Puerto Rico. Section B describes the two options for updating the food intake data to reflect Puerto Rican consumption patterns.

### Key Considerations for Food Intake Data

- To align with the mainland, Hawaii, and Alaska TFPs most closely, new primary food intake data could be gathered from individuals in Puerto Rico using two 24-hour dietary recall interviews, though it would be the costliest and most time-intensive option.
- Alternatively, if CNPP is comfortable making some assumptions, existing data, along with expert opinion, could be used to adjust mainland TFP datasets to account for differences in food intake.

### A. Use of Food Intake Data in the TFP Model

The TFP optimization model solves for a feasible market basket that meets nutrition, practicality, and cost constraints while deviating as little as possible from the average food intake patterns. Current food intake data from NHANES are used to understand average patterns of a typical diet across the U.S. population and, in turn, inform the TFP model in two ways. First, average food intake patterns are included as a model input and represent the ideal solution if no constraints were applied. Second, current food intake patterns are also used to construct two additional model inputs—the weighted average food category prices and the weighted average nutrient profiles.

#### 1. Need for Puerto Rico-Specific Food Intake Data

The use of food intake patterns specific to Puerto Rico in the TFP optimization model would ensure parity between a Puerto Rico and mainland TFP and that the final market baskets accurately reflect dietary patterns observed in Puerto Rico. Research has shown that average food intakes differ between Puerto Rico and the mainland United States. In 2019, an estimated 53 percent of people living in Puerto Rico reported consuming less than one fruit serving per day, and 44 percent reported consuming less than one vegetable serving per day. Intake of fruits and vegetables was higher for the mainland United States; only 39 percent and 20 percent of mainland Americans consumed less than one fruit and one vegetable serving a day, respectively (Centers for Disease Control and Prevention, 2017).

Food intake patterns also differ between Puerto Rican residents of the mainland United States and Puerto Ricans living on the island. Although low-income Puerto Ricans have a poor diet regardless of their location, those living on the mainland had a lower quality diet. In a sample of fewer than 100 individuals, Puerto Ricans living in Massachusetts consumed less whole fruit, vegetables, beans, and protein compared with those living in Ponce, Puerto Rico. Given these differences, it would be

<sup>12</sup> For an overview of WWEIA, see <https://www.ars.usda.gov/northeast-area/beltsville-md-bhnrc/beltsville-human-nutrition-research-center/food-surveys-research-group/docs/wweianhanes-overview/>.

inappropriate to apply the dietary intake patterns of Puerto Rican residents of the mainland to Puerto Ricans on the island (Lopez-Cepero et al., 2017).

Differences in food intakes between the mainland United States and Puerto Rico appear in the relative contribution of food categories and in the specific food items frequently consumed. A survey of 100 women in San Juan, Puerto Rico, found over a quarter of dietary fiber came from bean dishes, plantain dishes, and tuber roots. Rice contributed the most in terms of energy intake and carbohydrate intake (9.1 percent of total energy and 11 percent of carbohydrate intake). In the mainland United States, rice is a less important component of a typical diet, only contributing 1 percent and 3 percent toward total energy intake and carbohydrate intake, respectively. Although some foods are common to both the mainland U.S. and Puerto Rican diet, such as white bread, rolls, and crackers, the differences in their consumption highlight the need to use Puerto Rican-specific food intake data for a TFP (Truesdell et al., 2018).

## B. Options for Food Intake Data

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The study team identified two options for creating a Puerto Rico-specific food intake input: (1) collect new survey data from individuals in Puerto Rico, and (2) use existing data and expert input to adjust mainland data. This section presents an overview of both options.

### 1. Collect Food Intake Data From Individuals in Puerto Rico

The mainland TFP uses food intake data from NHANES. However, NHANES data are not collected in Puerto Rico, and it is not feasible to add Puerto Rico to this existing data collection (see appendix B for further details). As a result, the study team proposes an NHANES-like methodology for collecting food intake data from individuals in Puerto Rico.<sup>13</sup> The proposed approach mirrors the dietary interview component of NHANES and does not include other health-related questions or the examination component. These data would be most similar to the data used for the mainland TFP and would also ensure a Puerto Rico TFP that accurately reflects the food intake patterns of Puerto Ricans.

#### Approach

Data would be collected from a representative sample of approximately 1,750<sup>14</sup> Puerto Ricans aged 1 year and older. The estimated sample size is based on a simple random sample design and ensures a  $\pm 5$  percent relative margin of error at the 95 percent confidence level for overall Puerto Rico population-level estimates. Because there is no complete preexisting list of household addresses from which to draw a sample, a sampling frame would need to be created by using Census Block Groups across regions in Puerto Rico and sending interviewers to randomly selected blocks to canvass addresses and select a second-stage sample of household units. The study team recommends using Census Block Groups to create a sampling frame because it is the most accurate way to ensure each household has a chance of selection in the survey.<sup>15</sup>

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<sup>13</sup> For further information on the NHANES methodology for collecting food intake data, see <https://wwwn.cdc.gov/nchs/nhanes/Search/DataPage.aspx?Component=Dietary>.

<sup>14</sup> The study team determined a preliminary sample size of 1,750 completes to achieve a relative margin of error of 5 percent.

<sup>15</sup> This approach has also been used for other data collections in Puerto Rico; see <https://www.kff.org/report-section/views-and-experiences-of-puerto-ricans-one-year-after-hurricane-maria-methodology>. For the 2020 Census, the U.S. Census Bureau conducted enumeration to ensure capture of rural areas. If these updated Census data are available to researchers, using Block Groups would be the most efficient and cost-effective option.

The study team recommends contracting with local data collectors based in Puerto Rico to optimize efficiencies related to using interviewers who (1) do not need to travel long distances; (2) are familiar with the geographic areas and regional preferences; and (3) are familiar with Puerto Rican foods and terminology (as recommended by the expert study group).

The survey would comprise two interviewer-led dietary recalls collected from sampled adults and children in the household and demographic data collection. The use of two 24-hour dietary interviews is standard practice in dietary research to provide more reliable data and mirrors the methods employed for NHANES. The study team recommends both interviews be conducted in person approximately 3 to 10 days apart and a usual food intake questionnaire also be administered during the first interview. The questionnaire would facilitate a complete assessment of usual intakes, especially for infrequently consumed foods. Though NHANES does not include a usual food questionnaire, study group members recommended completing such a questionnaire in Puerto Rico because the National Cancer Institute SAS macros<sup>16</sup> used on the mainland may not be comprehensive of the Puerto Rico diet. The first interview is estimated to take 60 minutes to complete, and the second interview is estimated at 45 minutes. The study team assumes at least 5,250 households would need to be recruited to obtain approximately 1,750 completed interviews.

Postprocessing for the data would be extensive. For example, collected food intake data would need to be matched with nutrient databases to create the datasets required for the TFP optimization model. Calculating appropriate survey weights is also nontrivial because weights must take into account probability of selection, nonresponse, and calibration to population totals.<sup>17</sup>

### **Costs and timeline**

The estimated project timeline, including study planning, instrument development, Office of Management and Budget (OMB) and institutional review board (IRB) clearance, data collection, analysis, and data file creation, would span approximately 3-4 years and cost approximately \$1.2 to \$1.8 million, based on the recommended sampling approach and assumptions. See chapter 1, section B for more information on cost and timeline estimation.

Although it would be the costliest option, collecting food intake data from individuals will produce the most accurate data. Cost savings could potentially be achieved with the use of one rather than two dietary recalls, a food frequency questionnaire instead of a dietary recall, or a self-administered instrument or interviewer-assisted telephone interview instead of in-person data collection. The study group did not favor these approaches because each is subject to additional barriers and limitations. For example, landline telephone use is limited in Puerto Rico, and it is challenging to obtain cellular numbers for households. Disparities also exist in internet coverage and use by age group and income. For these reasons, to ensure sufficient representation, any web and telephone methods used would need to be paired with in-person follow-up. Experts also noted that respondents in Puerto Rico had experienced difficulties completing self-administered dietary surveys; thus, using these methods could lead to lower quality data. Finally, as mentioned previously, collecting two dietary recalls is the standard and

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<sup>16</sup> National Cancer Institute (NCI) macros can be used to estimate the distribution of usual food and nutrient intakes, assess the effects of nondietary covariates on usual consumption, and correct bias caused by measurement error in estimating associations between usual intake and health outcomes. For the TFP, the NCI macros are applied to NHANES food intake data to estimate the usual food or nutrient intakes for a population or subpopulation. For more information, see <https://epi.grants.cancer.gov/diet/usualintakes/method.html>.

<sup>17</sup> NHANES Analytic Guide, see [https://www.cdc.gov/nchs/data/series/sr\\_02/sr02-184-508.pdf](https://www.cdc.gov/nchs/data/series/sr_02/sr02-184-508.pdf).

preferred option in the nutrition field, and administering a food frequency questionnaire instead of a dietary interview would be a substantial deviation from the NHANES methodology.

### Considerations

A substantial benefit of this approach is that it would yield data comparable to those used for the mainland TFP; it would also ensure the data come from a Federal source and thus meet high standards. This method could be easily adapted for other outlying areas. New primary data collection would be the most accurate option and serve to bring parity and equality to Puerto Rico. To determine the Alaska and Hawaii TFPs, food intake and food price data were collected from households in the late 1970s. Conducting a new data collection would ensure data and methods used to calculate the cost of a TFP for the mainland, Alaska, Hawaii, and Puerto Rico would be similar.

The main disadvantages relate to the cost and the timeline. From the date CNPP releases the request for proposal for the primary data collection project, it would take approximately 4 years before data are collected, cleaned, and a final dataset is provided to CNPP for use in the TFP optimization model.

Challenges associated with recruiting a sufficient number of households could also lead to cost increases and delays. Expert study group members who have recently conducted primary food intake data collection in Puerto Rico noted significant barriers to creating an accurate sample frame and recruiting and retaining participants. While using local data collectors familiar with Puerto Rico will help mitigate some of these potential challenges, there is still a risk that the effort and costs associated with this project could be higher than anticipated.

Finally, USDA nutrition databases, such as the Food and Nutrition Database for Dietary Studies used to process food intake data from NHANES, may not contain data on all foods consumed in Puerto Rico. This information is essential to translate food intake data into a form that can be used for analysis. Other sources of nutrient data, such as the one maintained by the University of Minnesota,<sup>18</sup> have more recently been used for dietary studies conducted in Puerto Rico. These nutrient data may be valuable for the proposed project but would increase the associated costs.<sup>19</sup>

## 2. Use Existing Data and an Expert Panel to Adjust Mainland Food Intakes

Though NHANES does not collect data in Puerto Rico, other researchers interested in the relationship between food intake and health are currently collecting related data from Puerto Rican households on the island. The Puerto Rico Observational Study of Psychosocial, Environmental, and Chronic Disease Trends (PROSPECT) collected<sup>20</sup> data from a sample of 2,000 adults aged 30–75 in Puerto Rico using multistage probabilistic sampling of households and communitywide sampling approaches to recruit participants (Mattei et al., 2021). In addition to collecting data on demographics, health conditions, and medical history, the researchers administer a food frequency questionnaire to study participants. These data, which are then matched to a nutrient database compiled by the University of Minnesota, can be used to better understand consumption patterns in Puerto Rico and adjust mainland food intakes.

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<sup>18</sup> Nutrition Data System for Research (NDSR); see <http://www.ncc.umn.edu/ndsr-database-page>.

<sup>19</sup> The initial license for NDSR costs approximately \$6,000, with an annual \$4,000 support fee; see <http://www.ncc.umn.edu/products/pricing>.

<sup>20</sup> The study includes a baseline data collection and a 2-year follow-up.



## Approach

Under this approach, CNPP would convene a group of experts familiar with the PROSPECT data and food intake patterns in Puerto Rico more generally. The expert panel would review analyzed data from the PROSPECT food frequency questionnaire and compare them with the food intake input datasets used for the mainland TFP. The experts would determine whether new food categories are necessary for a Puerto Rico TFP or if the underlying foods in each category need to be updated to reflect the types of foods most commonly eaten in Puerto Rico. Based on this analysis, the expert panel would recommend adjustments to the food intake input datasets used by CNPP in the TFP optimization model. After applying these adjustments, CNPP would run the optimization model using these updated Puerto Rico-specific food intake input datasets.

## Costs and timeline

The costs associated with this option will vary depending on the entity completing the task. CNPP could choose to conduct the work in house and manage the expert panel with internal resources. Alternatively, CNPP could work with a contractor to manage the process and ensure progress on the associated tasks. Tasks might include analyzing PROSPECT data to facilitate panel review and comparisons with the mainland food intake inputs, forming and convening the expert panel, and summarizing conclusions from the expert panel related to adjusting the mainland food intake datasets.

Should CNPP choose to conduct the work internally, the costs of this approach would be minimal and would likely solely encompass an honorarium for each expert panel member. The study team recommends an honorarium of \$1,000 for each member and an expert panel of no more than five individuals. No costs are associated with obtaining access to the PROSPECT data, though CNPP would need to sign a memorandum of understanding to use the data. However, if current CNPP staff do not have the bandwidth to conduct the work, additional staff may need to be hired, which would increase costs.

Should CNPP decide to work with a contractor to manage the process and develop the datasets, the estimated cost would be \$300,000–\$400,000. If CNPP only engaged a contractor to recruit the experts and facilitate meetings, the cost would be less (i.e., closer to \$200,000). However, it will be essential to analyze and present information about the PROSPECT data to the expert group; therefore, it is advisable for the contractor to also perform this work.

Whether CNPP or a contractor performs the tasks associated with this option, the estimated timeline is 9 to 12 months. See chapter 1, section B for more information on cost and timeline estimation.

## Considerations

The advantage of using this food intake data option compared with collecting new primary data is quicker and more cost-efficient access to data that reflect Puerto Rico-specific food intake patterns.

The disadvantages of this option are primarily associated with some limitations of the PROSPECT data. First, although the study originally planned to select households randomly, not all participants were randomly sampled, so it is unclear whether the study is representative (because of challenges recruiting participants, the study employed a community recruitment strategy). However, the sample's characteristics are routinely checked against broader sociodemographic benchmarks to ensure as much

representation as possible (Mattei et al., 2021). Because data collection is still ongoing, final measures of potential bias and necessary weights are unknown.

The TFP uses food intake data for individuals over the age of 1; however, only individuals between the ages of 30 and 75 are included in the PROSPECT data. Researchers are currently conducting a parallel study, Puerto Rico Opportunity, which collects data from young adults aged 19–29 (Rosal & Perez, 2019). Data from these two sources could easily be combined because the methodologies are the same.

Food intake data for adults over the age of 75 in Puerto Rico are not available. CNPP would likely need to limit the two age-sex groups to 71–75 years or make assumptions regarding the food intake patterns of individuals over 75 using NHANES data as a comparison.

Food intake data for children is especially important for the calculation of the TFP because the cost of the TFP for a reference family of four, which includes a 6- to 8-year-old child and a 9- to 11-year-old child (in addition to two adults), is the basis of the SNAP allotment. While there are other food intake data collected from children in Puerto Rico, it is unclear how easily the data could be combined with data from adults, and it is likely that substantial assumptions would need to be made about food intake among Puerto Rican children.

Another option would be to supplement the PROSPECT data by contacting study households with children and requesting the child’s participation. While this potential option would help CNPP obtain food intake data from children, the sample would likely not be random or necessarily representative of children in Puerto Rico. It is also unclear whether the child sample would be sufficiently large for estimating usual food intakes. The additional recruitment and data collection would also increase costs and the associated timeline for this option. If it is important to CNPP to have food intake data from children in Puerto Rico, this option to supplement the PROSPECT data would likely be less costly and faster than collecting all new primary data from Puerto Ricans.

Lastly, should CNPP conduct the work internally, the Federal Advisory Committee Act (FACA) would likely apply, which could substantially increase the timeline and burden on CNPP staff. For example, complying with FACA would require the appointment of a Committee Management Officer to oversee the administration of the Act’s requirements and a Designated Federal Officer, who would be responsible for calling and adjourning meetings, approving meeting agendas, maintaining records, and providing copies of committee reports for the Library of Congress, among other responsibilities.<sup>21</sup>

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<sup>21</sup> For further details, see <https://www.gsa.gov/policy-regulations/policy/federal-advisory-committee-act-faca-management-overview>.

## Chapter 4. Food Price Data

A second component of the TFP optimization model is food price data. For the mainland TFP, CNPP uses IRI InfoScan data. While IRI does collect retail scanner data in Puerto Rico, there are some limitations to using this dataset. This chapter presents three options CNPP could use to create food price datasets for use in a Puerto Rico TFP: (1) use IRI InfoScan data; (2) conduct a vendor survey; and (3) collect food price data from households. Section A describes the need for Puerto Rico-specific food price data, and Section B describes the three options in detail.

### Key Considerations for Food Price Data

- To align most closely with the mainland TFP, existing IRI InfoScan data could be used to create a new price input dataset. This option would also be the quickest and least costly of the three, but the data do have limitations (i.e., urban focus, only large vendors included, limited private label data).
- Food price data could be collected using a vendor survey. This is a cost-effective and faster method than collecting new data from households and would address some of the limitations of existing data.
- New food price data could be gathered from households. This would be the costliest and most time-intensive option.

### A. Use of Food Price Data in the TFP Model

The TFP optimization model solves for a feasible market basket that meets nutrition, practicality, and cost constraints while deviating as little as possible from the average food intake patterns. Current food price data are used to calculate the weighted average price of each food category and, in turn, the total cost of the market baskets. The food price data used in a Puerto Rico TFP should reflect the prices of a typical Puerto Rican diet. Food prices in Puerto Rico are higher than in the mainland United States.<sup>22</sup> For this option, new or existing food price data would be used to create food price datasets (i.e., average price per 100 grams for every food category) for use in a Puerto Rico TFP model.

### B. Options for Food Price Data

This section describes three options for obtaining food price data that could be used to produce a Puerto Rico TFP. Each option description includes the proposed approach, timeline and costs, and considerations.

#### 1. Use Existing IRI InfoScan Data

CNPP currently uses the PPPT to compile food price data from IRI InfoScan and develop the food price input for the mainland TFP. IRI InfoScan includes data (total sales volumes and values for every UPC by vendor or market area aggregated over a period) from vendors in Puerto Rico and could be used as a source of price data for a Puerto Rico TFP.

#### Approach

Consistent with the mainland TFP, average food prices in Puerto Rico could be calculated from the IRI InfoScan data using the PPPT (Carlson et al., 2020). The PPPT enables users to estimate as-consumed and as-purchased prices for foods reported as consumed by NHANES participants. Average as-consumed

<sup>22</sup> In 2014, the C2ER COLI found grocery prices in Puerto Rico were 27 percent higher than in the mainland United States (Hirschfeld, 2014).

prices for each food and beverage could then be combined into food categories. Average unit prices for each food category should be weighted by the relative importance of each food or beverage. For the mainland TFP, the relative importance of each food and beverage is determined by recent NHANES food intake data. New primary food intake data collected from households or PROSPECT data could be used to develop a weighting scheme for a Puerto Rico TFP.

### **Costs and timeline**

USDA ERS currently purchases InfoScan data from IRI. If CNPP were to move forward with this approach, it would need to request access to the data and complete an agreement noting which data were needed and how the data would be used. IRI would then generate a third-party agreement, and CNPP would gain access to the IRI data through the NORC Data Enclave.

The IRI InfoScan data would be available through the NORC Data Enclave to the primary investigator for \$4,350, and each additional NORC account would cost \$2,250. Acquiring access to the IRI InfoScan data would take approximately 4 weeks for a USDA employee. The previous year's data typically become available to ERS in the early summer and are available to users in early fall. The estimated timeline for this option would be 3–6 months, including gaining access to the IRI data and creating the input dataset. However, delays in ERS obtaining IRI data or a need to wait for more recent data could extend the timeline. Likewise, the timeline could be reduced if CNPP already has access to IRI InfoScan data for all required users. See chapter 1, section B for more information on cost and timeline estimation.

### **Considerations**

A key advantage to this approach is that it is consistent with the mainland TFP. This option also has the lowest cost and provides the quickest access to data among the three options for obtaining Puerto Rico-specific food prices.

The primary disadvantages are related to limitations with the existing data. Some vendors withhold total sales volume or product container sizes to prevent the calculation of average unit prices. Data on some private label (i.e., store brand) items for certain large retailers are not included. In Puerto Rico, the IRI InfoScan data consist of data collected only from large grocery and pharmacy chains, such as Walmart, Sam's Club, Amigos Super Market (owned by Walmart), CVS, and Walgreens; medium and small vendors are excluded from the data. However, the effects may be negligible: A 2015 study found only 8 percent of benefits were redeemed at small or medium grocery stores (Trippe et al., 2015). NAP electronic benefit transfer (EBT) redemption data could also provide insight on the importance of small vendors in Puerto Rico among low-income households. Regardless of store type, IRI data may be biased if stores in the dataset do not represent the entirety of vendors on the island because data are only collected from vendors in urban areas. Additionally, because data are captured from a relatively small number of vendors in Puerto Rico, this could lead to potential bias in food prices if, for example, food prices for certain items were only observed for one or two vendors.

The PPPT tool enables users to estimate the prices of foods consumed by NHANES participants. However, NHANES does not collect data in Puerto Rico. It is possible, therefore, that food intake data collected in Puerto Rico for the purposes of a TFP may include foods that are not reported in NHANES. Modifications may need to be made to the PPPT to account for these new foods, which could lead to

additional costs<sup>23</sup>. Additionally, the PPPT has only been validated for national average prices; it has not yet been tested for producing region, State, or territory-specific average prices.

## 2. Collect Food Price Data From Vendors

Another option for obtaining Puerto Rico-specific food price data is to collect them directly from a sample of vendors in Puerto Rico.<sup>24</sup> For this option, using a predetermined list of food items, data collectors would record observed store prices and the unit sizes of the items from a range of local vendors. These data would be used to construct food price inputs (i.e., average food prices for each food category) for a Puerto Rico TFP model.

### Approach

Prior to data collection, experts familiar with food intake patterns in Puerto Rico would create a list of food items representative of a typical Puerto Rican diet. The experts could use either existing food intake data or preliminary results from a TFP-related food intake data collection to support this effort. The mainland TFP market basket for a reference family of four could be used as a starting point. The next step would be to sample or select vendors for the study. The study team recommends a purposeful sample of 60 total vendors<sup>25</sup> across the 10 regions in Puerto Rico. While a random sample is unnecessary<sup>26</sup>, the sample should include vendors that vary in location (i.e., urbanicity) and size (i.e., microenterprise, small business, medium business, supermarket or grocery store, and megastore). Data collectors would choose one area in each region and visit six vendors in the area to minimize travel costs.

Using either a web- or paper-based tool, trained local data collectors would visit vendors and record the prices and unit sizes of select food items. To avoid on-the-spot decisions about acceptable substitute items, data collectors should be trained to record an item price as missing when food items are unavailable at the store (i.e., if the vendor does not sell kale, the data collector should record the price as missing rather than noting the price of a food substitute, such as collard greens). The study team anticipates each vendor survey will take approximately 60 minutes, on average, excluding travel time, but this estimate may vary based on data collector experience and the length of the final food list. Once the price data are collected, all prices will be converted into a standard per unit measure and used to calculate average prices for each food category that can be input into a Puerto Rico-specific TFP model. Each vendor could be given equal weight in the calculation of average food category prices.

Alternatively, using NAP EBT data, food price data could be weighted by vendor size or sales volume. As a last step, CNPP will need to transform the as-purchased prices to as-consumed prices for inclusion in the TFP optimization model.

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<sup>23</sup> Updates to the PPPT could result in additional costs should ERS need to modify their existing contract with Westat.

<sup>24</sup> A member of the expert study group used a similar approach to collect food prices in Alaska, Hawaii, and other Pacific islands.

<sup>25</sup> In 2021, there were 3,085 NAP vendors in Puerto Rico. Given the estimated sample size of 60 vendors, approximately 2 percent of NAP stores would be included in the sample. The study team determined 60 vendors, or 6 per region, would be an appropriate sample size based on other similar data collections that visited 3 vendors within a community (Greenberg et al., 2020). Because the Puerto Rico regions are larger than communities, the study team increased the number of vendors from 3 to 6.

<sup>26</sup> The study team recommends a purposive sample, similar to the approach used by Greenberg, et al. to select vendors in target communities. CNPP could choose to randomly sample vendors, though this would likely increase data collection costs as data collectors may need to travel long distances between sampled vendors. Selecting vendors in targeted communities would allow for a more streamlined data collection approach.



## Costs and timeline

Collecting price data from vendors is estimated to cost between \$500,000 and \$750,000. The estimated project timeline, including study planning, instrument development, data collection, and analysis, would span approximately 1–2 years. The timeline could be shortened by modeling the data collection approach and methods of similar previous data collections in Alaska, Hawaii, and the Pacific islands (Greenberg et al., 2020). The timeline assumes OMB clearance would not be required because the study design places no effort on the part of store managers to collect prices. If OMB clearance were required, the timeline would likely increase by 1 year; costs would also increase. See chapter 1, section B for more information on cost and timeline estimation.

## Considerations

One advantage of obtaining food prices directly from vendors is that it would expand the sample of vendors compared with the number of vendors that report sales data to IRI. This approach could result in more variation among rural and small vendors and present a more descriptive and accurate portrayal of food prices across Puerto Rico. This approach could also be easily applied in other outlying areas; only the food list would need to be adapted to ensure local relevance.

A key consideration for this option is whether local vendors would need to be recruited or if the local data collectors could observe the listed prices without requesting permission from a store manager. If local vendors (e.g., store managers) need to be recruited, the study would place a data collection burden on these individuals. For example, the store managers may need to review recruitment materials or reply to data collection requests. Thus, if local vendors were recruited, in accordance with the Paperwork Reduction Act of 1995,<sup>27</sup> CNPP would need OMB approval to conduct the data collection. The process for requesting and receiving OMB approval could increase the costs and study timeline by 1 year. If local data collectors could observe listed prices without requesting permission from a store manager, then OMB approval would not be required because no burden would be placed on the public to respond to the data collection.

## 3. Collect Food Price Data From Households in Puerto Rico

As an alternative to conducting a vendor survey, Puerto Rico-specific food prices could be gathered from households based on a simplified version of the National Household Food Acquisition and Purchase Survey (FoodAPS) methodology.<sup>28</sup>

### Approach

This approach involves collecting household-level food price data from a representative sample of approximately 1,750 households<sup>29</sup> across Puerto Rico. The estimated sample size is based on a simple random sample design and ensures a  $\pm 5$  percent relative margin of error at the 95 percent confidence level for overall Puerto Rico population-level estimates. Similar to the primary data collection option discussed in chapter 3, a sampling frame would need to be created. The study team recommends using

<sup>27</sup> For further information, see: <https://www.congress.gov/bill/104th-congress/senate-bill/244>

<sup>28</sup> While FoodAPS gathers data on all household food acquisitions, including gifted foods and foods for consumption away from home, the proposed approach would only gather price data for foods purchased for at-home consumption. SNAP benefits cannot be used at restaurants or to purchase other hot meals (e.g., a rotisserie chicken at a grocery store), so these additional data would not be applicable to the TFP. For more information on the FoodAPS-1 study methods, see <https://www.ers.usda.gov/data-products/foodaps-national-household-food-acquisition-and-purchase-survey>.

<sup>29</sup> The study team determined a preliminary sample size of 1,750 completes to achieve a relative margin of error of 5 percent.

Census Block Groups across regions in Puerto Rico and sending interviewers to randomly selected blocks.

For this survey, local data collectors would conduct two in-person interviews with the primary shopper of the household. The first interview would last about 30 minutes and include a screening to determine survey eligibility and questions to capture demographic information about household members. Immediately following the interview, eligible respondents would participate in a 45-minute training on how to record food prices of all foods purchased for at-home consumption during a 1-week period using a provided scanner or smartphone application (app). Receipts could also be requested or uploaded to the app for price verification. Data collectors would contact respondents via telephone three times throughout the week to check in and verify adherence to the protocols. A final in-person interview would be conducted after the respondent completes the week-long data collection period; the interview would last approximately 40 minutes and collect data on household income and food security.

### **Costs and timeline**

Collecting food price data from households in Puerto Rico would be more costly than the alternative options discussed in sections 1 and 2 (i.e., using existing data or collecting price data from vendors). The project, including study planning, instrument development, OMB and IRB clearance, data collection, analysis, and data file creation, would span approximately 4–5 years and cost approximately \$1.7 to \$2.6 million based on the recommended sampling approach and assumptions. See chapter 1, section B for more information on cost and timeline estimation.

Costs would be higher if CNPP needed to develop a smartphone app for study use instead of entering into an agreement with ERS to use the app developed for FoodAPS-2. If a scanner approach were used instead of an app, data cleaning and postprocessing costs would likely be higher, thereby inflating the total cost of the option.

### **Considerations**

One advantage of this option is that the gathered food price data would reflect the prices of items purchased by Puerto Rican households. Surveying households also ensures a Puerto Rico TFP uses a Federal data source for price inputs.

Key considerations of this option are the high cost and lengthy timeline. Matching scanned items to existing food databases (e.g., IRI UPC characteristics data, USDA Branded Food Product Database UPC characteristics data) to capture product information such as package size could also be a challenge in Puerto Rico. For example, generic items or items not commonly found on the mainland would likely not be in current databases. Additional efforts during the data cleaning process would be needed to correctly categorize and identify the package size of these missing food items. According to experts at ERS, post data collection processing for FoodAPS-1 increased the original study timeline by 2 years. For FoodAPS-2, ERS is using a smartphone app to lessen the amount of data processing and the time needed after data collection. Results from the pilot study, which is scheduled to start in January 2022, could be used to assess whether investing in a smartphone app or exploring the use of ERS's FoodAPS-2 app for data collection in Puerto Rico would be worthwhile. Additionally, although not likely to extend the timeline, the final as-purchased prices would need to be converted to as-consumed prices for inclusion in the TFP optimization model.

Similar to the primary data collection option for food intakes, challenges associated with recruiting a sufficient number of households could lead to cost increases and delays in data collection. While using local data collectors familiar with Puerto Rico will mitigate some of these challenges, the effort and cost associated with this option could still be higher than anticipated. Lastly, without frequent prompting, respondents may also forget to scan prices, have technical problems using the equipment, or encounter other issues that lead to missing price data.

## Chapter 5. Final Considerations

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The preceding chapters provided an overview of the options for measuring the cost of a TFP in Puerto Rico. This chapter presents final considerations that crosscut various options. Section A presents a cross-analysis of the options and the study team's recommendations, and section B presents implications for the other outlying areas.

### A. Cross-Analysis of Options and Recommendations

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The report presents two approaches to measuring the cost of a TFP in Puerto Rico. The study team recommends CNPP first choose an approach and then determine the preferred options within the selected approach.

- ▶ Approach 1, as described in chapter 2, entails adjusting the cost of the mainland TFP market basket for the reference family of four to account for differences in food prices in Puerto Rico using data from C2ER, OPM, or IRI InfoScan.
- ▶ Approach 2, as described in chapters 3 and 4, entails collecting new data or adjusting existing data for use in the 2021 TFP optimization model. Chapter 3 presented two options for food intake data: collect new primary data from individuals or use existing data to modify input datasets. Chapter 4 presented three options for food price data: use existing IRI InfoScan data, collect new primary data from vendors, or collect new primary data from households.

Although Approach 1 would be quick, simple, and low cost, it does not account for differences in food intake between Puerto Rico and the mainland and therefore may not be advisable. However, under time and cost constraints, approach 1 does provide feasible options. Approach 2 would take longer and cost more, but it may also bring parity and equality to Puerto Rico by ensuring the resulting TFP market baskets align with the Puerto Rican diet.

Ultimately, to create market baskets that are fully relevant and optimized for Puerto Rico, CNPP would need to select an option for updating the food intake and food price inputs. Approach 2 provides for six option combinations (see table 5.1). A brief description of each combination follows:

- ▶ Combination 1 would be most similar to the mainland U.S. TFP, with food intake data collected directly from households and price data coming from IRI InfoScan. However, collecting food intake data directly from households would be costly and take up to 4 years. While IRI InfoScan data are used for the mainland TFP, the sample of vendors in Puerto Rico is limited and confined to urban areas, and the data are missing some key elements (e.g., prices for certain private label items).
- ▶ Combination 2 includes collecting new food intake data from individuals and food price data from vendors. Second to using IRI InfoScan data, collecting data from vendors in Puerto Rico would be most similar to the approach used for the mainland TFP. While this approach would be more costly than combination 1, it would take approximately the same amount of time.
- ▶ Combination 3 would be the costliest and take the most time. Although presented as separate data collections in this report, it would be feasible to collect both food intake and food price data from the same households in Puerto Rico (i.e., conduct a single data collection for combination 1). As a result of efficiencies in sample design and recruitment, doing so would

effectively reduce costs compared with the cost of undertaking both studies separately. To ensure success and avoid respondent confusion, however, experts advised these data collections be staggered by several weeks, and substantial incentives may be needed to retain responding households for both efforts.

- ▶ Combination 4, which uses existing data for both food intake and price, would be less costly and time intensive than combination 1. Should CNPP be comfortable making assumptions about food intake patterns in Puerto Rico based on existing data, this combination would be suitable if CNPP needed to develop a Puerto Rico-specific TFP in about a year, rather than the 3-to-4-year timeline associated with combination 1.
- ▶ Combination 5—that is, using existing food intake data along with expert input and collecting new price data from vendors—was preferred by the expert study panel because it provides for relatively high accuracy, lower costs, and a more expedient timeline than the primary data collection options specified for combination 1. Because of the importance of the price data in a Puerto Rico TFP, the panel felt a new data collection was warranted. The study panel preferred the option of collecting new data from vendors rather than households because it is cost-effective and has a shorter timeline without substantially compromising accuracy. However, the study group met prior to the release of the updated 2021 TFP methodology; this recommendation reflects an understanding of the TFP based on the now outdated 2006 methodology.
- ▶ Combination 6 would use existing food intake data and collect new food price data from households. Given the long timeline associated with collecting new food price data, it may be advantageous to collect new food intake data as well, rather than using existing.

A comprehensive set of food price data would create final market baskets that account for food prices in Puerto Rico (i.e., include higher quantities of foods with relatively lower prices in Puerto Rico and lower quantities of foods with relatively higher prices in Puerto Rico). However, ideal implementation of this approach is dependent on the selection of an equally comprehensive collection of food intake data in Puerto Rico. Without accompanying food intake data at a granular food item level in Puerto Rico, the comprehensive set of food price data cannot be properly weighted and is likely to yield misleading and/or inaccurate estimates of average food category prices. Therefore, combinations 4, 5, and 6 should be considered with caution.

**Table 5.1. Possible Combinations for Producing a Puerto Rico TFP Using Approach 2**

Combination	Food Intake Data				Food Price Data			
	Option	Cost	Timeline	Similar to Mainland TFP	Option	Cost	Timeline	Similar to Mainland TFP
1	Collect new data from individuals	\$1.2–1.8m	3–4 years	✓	Use existing IRI InfoScan data	< \$5,000	3–6 months	✓
2	Collect new data from individuals	\$1.2–1.8m	3–4 years	✓	Collect new data from vendors	\$0.5–0.75m	1–2 years	✗
3	Collect new data from individuals	\$1.2–1.8m	3–4 years	✓	Collect new data from households	\$1.7–2.6m	4–5 years	✗

Combination	Food Intake Data				Food Price Data			
	Option	Cost	Timeline	Similar to Mainland TFP	Option	Cost	Timeline	Similar to Mainland TFP
4	Use existing data and expert input	\$0.3–0.4m	9–12 months	✗	Use existing IRI InfoScan data	< \$5,000	3–6 months	✓
5	Use existing data and expert input	\$0.3–0.4m	9–12 months	✗	Collect new data from vendors	\$0.5–0.75m	1–2 years	✗
6	Use existing data and expert input	\$0.3–0.4m	9–12 months	✗	Collect new data from households	\$1.7–2.6m	4–5 years	✗

Note: A check mark indicates the proposed option aligns with the current mainland TFP methodology; an X indicates it does not.

m = million

### 3. Other Considerations

In the 2018 Farm Bill, Congress stipulated that CNPP must update the TFP every 5 years. Because of the long timelines and high costs associated with primary data collection from individuals and households, it may not be possible for these data to be collected and updated every 5 years; however, they could be used to determine the cost of an initial Puerto Rico TFP that CNPP could update periodically using other sources. For example, a periodic vendor survey could be administered relatively easily in Puerto Rico, and IRI collects new InfoScan data each year. It would be more challenging to assess food intake patterns in Puerto Rico every 5 years (because primary data collection is time-consuming and costly and PROSPECT data would not be available ongoing), though it is unlikely food patterns would change dramatically within this time span.

If Congress mandates or CNPP opts to move forward with collecting primary data from individuals or households, it would be advantageous for CNPP to confer with other Federal agencies (e.g., Centers for Disease Control and Prevention) about opportunities to leverage this data collection effort (i.e., to answer additional important research questions). NHANES is an excellent example of an effective interagency partnership established to achieve a set of parallel goals and objectives.

## B. Implications for Other Outlying Areas

One objective of the study was to assess the applicability of the options for measuring the cost of a TFP in other outlying areas, including Alaska, Hawaii, Guam, the U.S. Virgin Islands (USVI), American Samoa, and the Commonwealth of the Northern Mariana Islands (CNMI). While several identified options could only be applied in a subset of the outlying areas because of data limitations (e.g., using IRI data or a C2ER COLI), the primary data collection options could be implemented in all outlying areas. Table 5.2 summarizes the applicability of each option to the other outlying areas.



**Table 5.2. Applicability of Proposed Options to Other Outlying Areas**

Option	Applicability
C2ER COLI	In addition to San Juan, Puerto Rico, C2ER only collects price data in urban areas in Hawaii and Alaska. This option would not be applicable to Guam, USVI, CNMI, or American Samoa.
OPM COLA	OPM conducts periodic cost-of-living surveys in Alaska, Hawaii, Guam, CNMI, Puerto Rico, and USVI. This approach could be applied to all outlying areas except American Samoa.
IRI InfoScan data	In addition to Puerto Rico, IRI collects price data in Alaska and Hawaii. More information on the vendor samples in these outlying areas and whether available prices are vendor-specific or reflect prices for a larger market area is required to confirm it as a viable option. The approach would not be applicable to Guam, USVI, CNMI, or American Samoa.
Primary food intake data collection	Proposed data collection approach (see chapter 3, section B.1) could be applied to all outlying areas.
Existing food intake data and expert input	Though the study team is not currently aware of any studies (other than NHANES in Hawaii and Alaska) collecting food intake data in the outlying areas, should these data be available, they could be used to modify mainland food intake input datasets.
Primary food price data collection from vendors	Currently, a study group member is conducting food price data collection from vendors in Alaska, Hawaii, Guam, CNMI, and American Samoa. <sup>a</sup> CNPP could decide to expand these efforts or conduct new vendor data collection in these outlying areas. Though the study team is not aware of any food price vendor data collection in USVI, this approach could easily be applied to the territory.
Primary food price data collection from households	Proposed data collection approach (see chapter 4, section B.3) could be applied to all outlying areas.

CNMI = Commonwealth of the Northern Mariana Islands; CNPP = Center for Nutrition Policy and Promotion; COLA = cost-of-living adjustment; COLI = cost-of-living index; NHANES = National Health and Nutrition Examination Survey; OPM = Office of Personnel Management; USVI = United States Virgin Islands

<sup>a</sup> According to a February 2020 subject matter expert interview, the team that completed the original assessment of the Affordability of a Thrifty Food Plan-based Market Basket in the United States-affiliated Pacific Region (Greenberg et al., 2020) in March 2014 was planning to gather new food price data in March 2020.

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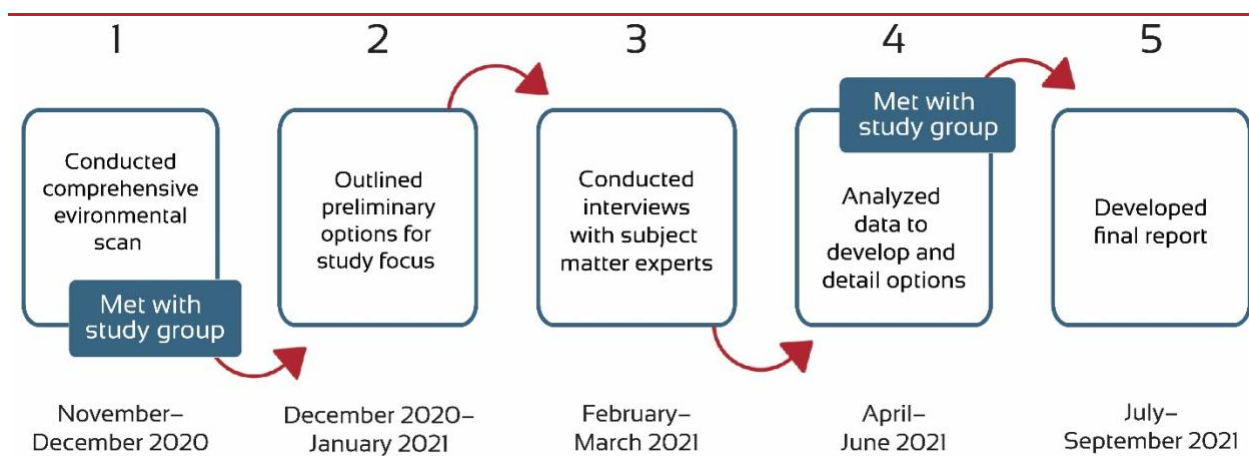
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## Appendix A. Study Approach and Study Group Members

### A. Study Approach

To identify options for measuring the cost of a Thrifty Food Plan (TFP) in Puerto Rico, the study team conducted an environmental scan, convened an expert study group for two meetings, conducted interviews with subject matter experts, and synthesized information across sources. The expert study group, composed of researchers and economists from the mainland United States and Puerto Rico, was engaged to advise on the project from December 2020 to May 2021. Study group members were selected for their knowledge of the TFP, relevant methodological expertise, familiarity with proposed data sources, and understanding of food and nutrition issues in Puerto Rico. This appendix provides a brief overview of the study approach (illustrated in figure A.1) and the names and affiliations of the expert study group members (table A.1).

**Figure A.1. Overview of Study Approach**



**Step 1. Conducted a comprehensive environmental scan.** Shortly after project initiation, the study team conducted a comprehensive environmental scan of the literature, published reports, and relevant data documentation to understand all potential data sources for measuring the cost of a TFP in Puerto Rico. This process included identifying existing sources of food intake and food price data, cost-of-living indices (COLI), and cost-of-living adjustment (COLA) factors that could be used to adapt the mainland TFP for Puerto Rico and reviewing related documentation. The study group met in December 2020 to discuss the potential data sources, COLIs, and COLA factors identified through the scan and options for primary data collection.

**Step 2. Outlined preliminary options for study focus.** Following the study group meeting, the study team developed a preliminary set of options on which to focus the study. The study team summarized the preliminary options in a memorandum, presented them to CNPP in January 2021, and received approval to proceed with subject matter interviews.

**Step 3. Conducted interviews with subject matter experts.** Interviewees were selected based on their relevant, in-depth knowledge of data sources and/or methods applicable to the selected options. The study team conducted five subject matter expert interviews. The interviews closely examined a particular data source or method to understand whether and how it could be used to support measuring

the cost of a TFP in Puerto Rico. Following the interviews, some experts also provided copies of available datasets, files, or documentation with additional or supporting information.

**Step 4. Analyzed data to develop and detail options.** When the interviews were complete, the study team compared, analyzed, and costed each option. The team considered response rates and sample sizes, as applicable; data quality; and the advantages and disadvantages of each data source or approach, including whether the data was from a Federal Government source. In May 2021, once analysis was complete, the study team convened the expert study group to present and discuss the preliminary set of final options.

**Step 5. Developed final feasibility and cost report.** Finally, information gathered across all project phases, including feedback from the expert study group, was synthesized to finalize the eight options described in this report.

## B. Study Group Members

Table A.1 presents the names, titles, and affiliations of study group members.

**Table A.1. Study Group Members**

Name	Title and Affiliation
Clarissa Brown	Nutritionist, Nutrition and Economic Analysis, Center for Nutrition Policy and Promotion (CNPP)
Josiemer Mattei	Professor, T.S. Chan School of Public Health, Harvard
Julio C. Hernandez Correa	Professor, Department of Agricultural Economics and Rural Sociology, University of Puerto Rico, Mayaguez
Kevin Kuczynski	Nutritionist, Nutrition and Economic Analysis, CNPP
Kevin Meyers Mathieu	Economist, Nutrition and Economic Analysis, CNPP
Mark Lino	Economist, Nutrition and Economic Analysis, CNPP
Mary Muth	Director of Food, Nutrition, and Obesity Policy Research, Research Triangle Institute
Parke Wilde	Professor, School of Nutrition Science and Policy, Tufts University
Rachel Novotny	Professor, College of Tropical Agriculture and Human Resources, University of Hawaii
TusaRebecca Pannucci	Lead Nutritionist, Nutrition and Economic Analysis, CNPP
Uriyoan Colon-Ramos	Professor, School of Public Health, George Washington University

## Appendix B. Dismissed Options for Measuring the Cost of a TFP in Puerto Rico

Table B.1 presents options for measuring the cost of a TFP in Puerto Rico that were identified during the environmental scan but ruled out after closer review, discussion with the study group, or input from subject matter experts.

**Table B.1. Ruled Out Options for Measuring the Cost of a TFP in Puerto Rico**

Option	Reason for Dismissal
National Health and Nutrition Examination Survey (NHANES) in Puerto Rico	The study team spoke to staff from the Centers for Disease Control and Prevention who implement NHANES and learned that adding Puerto Rico to NHANES would require Congress to change the mandate of the NHANES data collection. Even if Puerto Rico were added to NHANES, there is no guarantee Puerto Rico would be sampled as one of the data collection sites. The goal of NHANES is to provide nationally representative data, and it would likely take many years and rounds of NHANES before enough Puerto Ricans participated in the data collection to be able to calculate Puerto Rico-specific estimates.
The 1977–1978 Nationwide Food Consumption and Price Survey	The data are very old, and the methodology does not align with current standards.
Agricultural Marketing Service Reports	The data do not include a sufficient number of food categories for use in a TFP.
Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) electronic benefit transfer (EBT) data	As of the time of this report, Puerto Rico has not yet implemented EBT island wide for WIC.