Capturing Nutrition Information for Food Items Reported in FoodAPS-2: Survey Methodological Enhancements for Evidence-Based Policymaking and Research

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USDA **Economic Research Service**
www.ers.usda.gov

FoodAPS

National Household
Food **A**cquisition and **P**urchase **S**urvey

Comprehensive data on **household food purchases and acquisitions**.

- **Food-at-home** (FAH) retailers
- **Food-away-from-home** (FAFH) places
- **Foods obtained for free**
- **All household members** over **seven days**
- **April 2012** to **January 2013**

FoodAPS-1 Sample

Nationally representative of U.S. households (4,826)

Four target populations:

- **SNAP households** (1,581)
- **Non-SNAP households** with income:
  - **< 100% of the federal poverty guideline** (346)
  - **≥ 100% and < 185%** of the federal poverty guideline (851)
  - **≥ 185%** of the federal poverty guideline (2,048)

Food Economics Questions
for Evidence-Based Policymaking

- Food purchases and acquisitions
  - **What foods do households acquire**, where, and at what price?

- Food **environment**, **access** and **affordability**
  - Which consumers lack **access to healthful, affordable food**?
  - Does ease of access matter for **nutritional quality of purchases**?

- **Food and nutrition safety net**
  - How do USDA **food assistance programs** like SNAP, WIC, and School Meals influence **nutrition security**, **diet quality** and well being?

FoodAPS-1 Survey

Households
- Income
- Food security
- Diet and nutrition knowledge
- Food assistance program participation

Individuals
- Demographics
- Eating occasions
- School attendance
- Dietary restrictions

Events
- Place
- Total paid
- Payment type

Items
- Descriptions
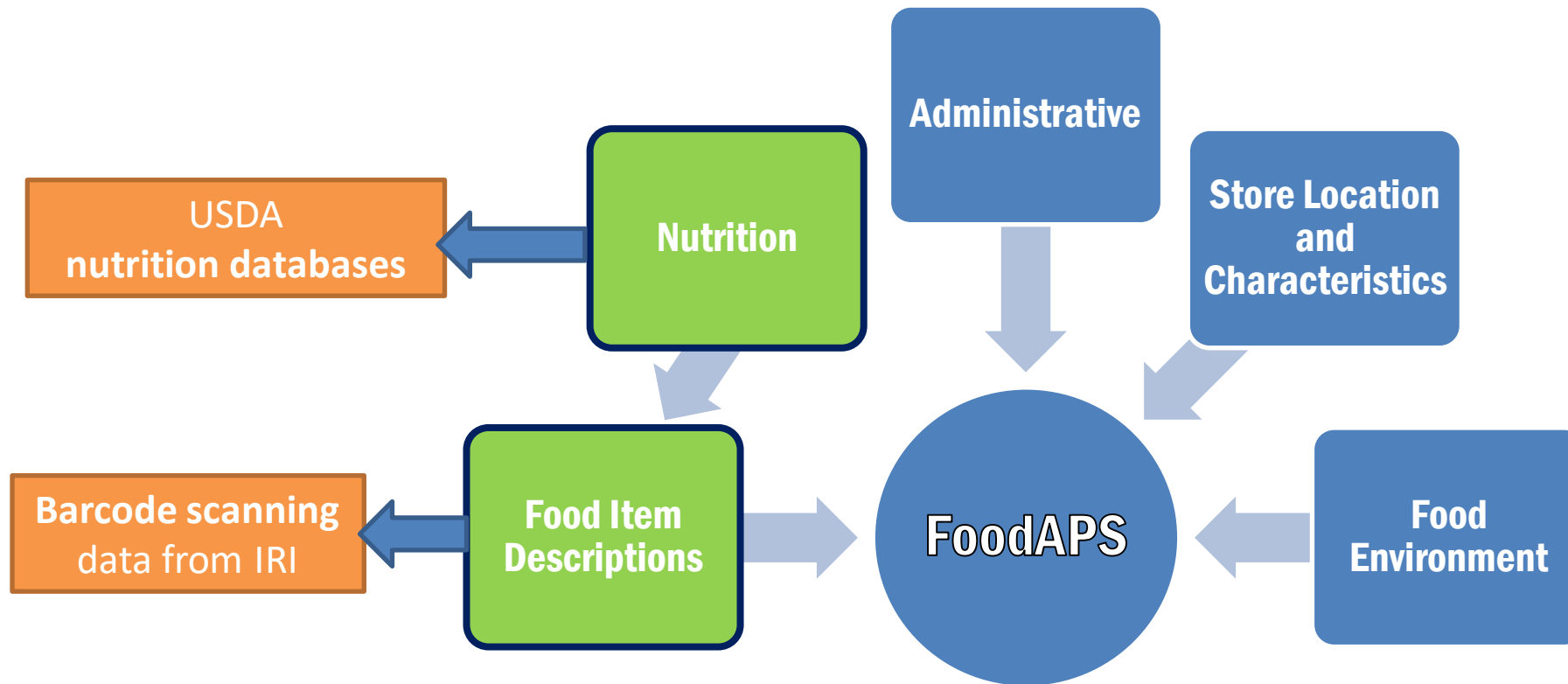- Quantities
- Expenditures
- Prices

Data collection:
Paper **food books, hand-held barcode scanners, receipts**, in-person **interviews, telephone** interviews for FAFH items

Integrating Nutrient Data

Extant data were linked to **reduce respondent burden** and **enhance data analysis**.
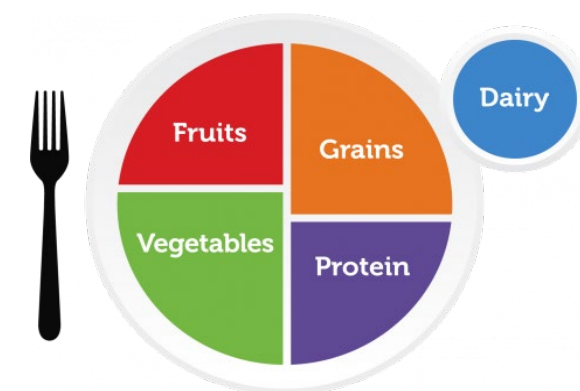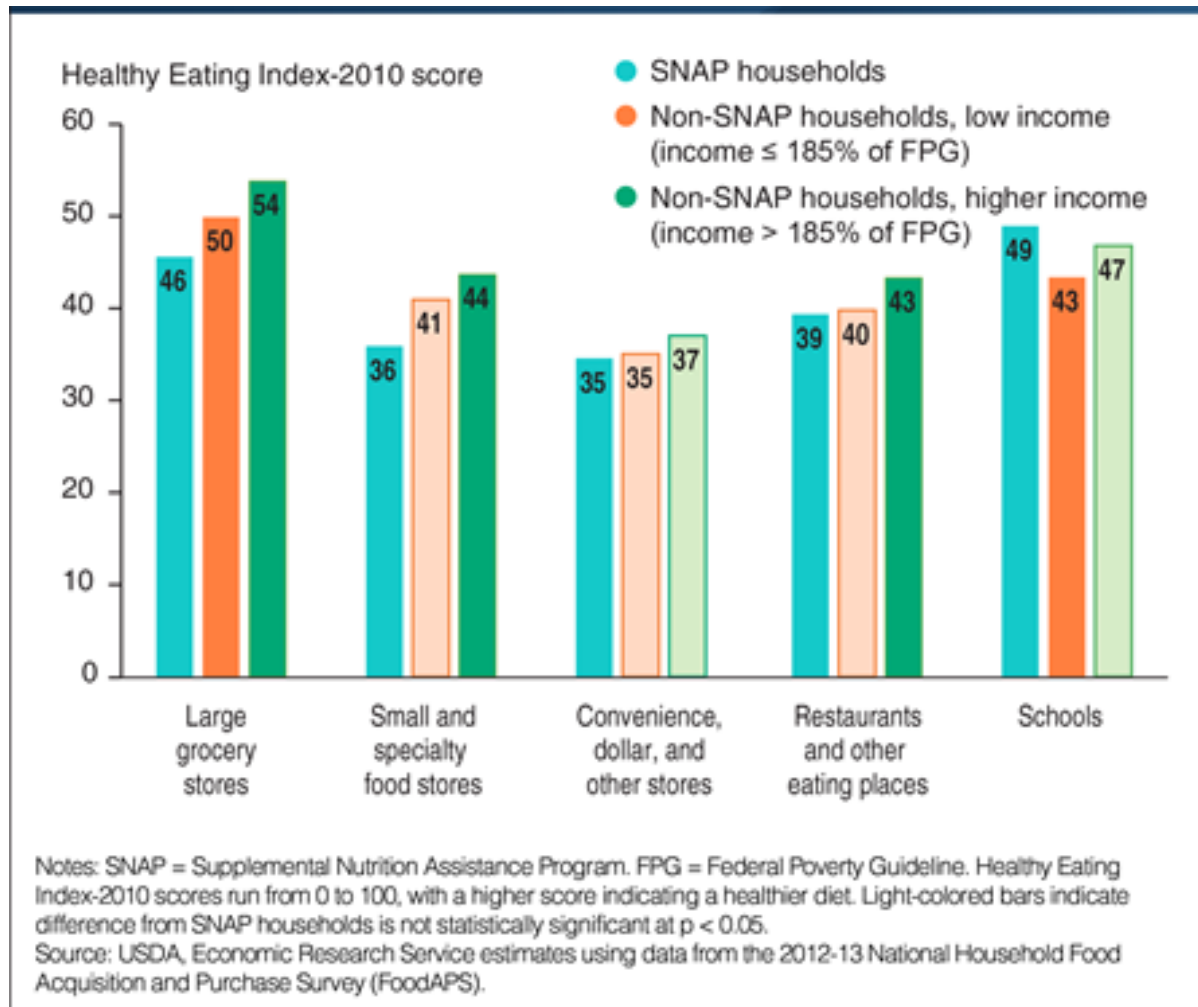
Healthy Eating Index

The *USDA Healthy Eating Index* (HEI)
- Assesses how well a **set of foods** aligns with the *Dietary Guidelines for Americans*
- NHANES/WWEIA **24-hour recall food intake survey**
- **Updated** with new each release of the *Guidelines*

FoodAPS: Evaluate how well the mix of foods *acquired* by consumers (*purchased* or for *free*) aligns with dietary recommendations

FoodAPS: HEI for Household Acquisitions, by Food Place and SNAP Participation

Healthy Eating Index-2010 score

Legend:
- SNAP households
- Non-SNAP households, low income (income ≤ 185% of FPG)
- Non-SNAP households, higher income (income > 185% of FPG)

Food Place	SNAP	Non-SNAP low income	Non-SNAP higher income
Large grocery stores	46	50	54
Small and specialty food stores	36	41	44
Convenience, dollar, and other stores	35	35	37
Restaurants and other eating places	39	40	43
Schools	49	43	47

Notes: SNAP = Supplemental Nutrition Assistance Program. FPG = Federal Poverty Guideline. Healthy Eating Index-2010 scores run from 0 to 100, with a higher score indicating a healthier diet. Light-colored bars indicate difference from SNAP households is not statistically significant at p < 0.05.
Source: USDA, Economic Research Service estimates using data from the 2012-13 National Household Food Acquisition and Purchase Survey (FoodAPS).

Mancino, L and J. Guthrie. 2018 "Supermarkets, Schools, and Social Gatherings: Where Supplemental Nutrition Assistance Program and Other U.S. Households Acquire Their Foods Correlates With Nutritional Quality" Amber Waves, U.S. Department of Agriculture, Economic Research Service

FoodAPS-1 : Item Identification and Nutrient Coding Challenges

FAH: 143,000 total; 55,000 unique items

- **34% items with no usable barcodes**
- Most receipts were **missing size/weight information**
- Food book entries incomplete, illegible, inconsistent

FAFH: 115,000 total; 22,000 unique items

- **40% acquisitions free, no receipts**
- **14%** match to *MenuStat* database
- **59% item weights/servings sizes were imputed**

The World Has Changed….

- First **iPhone** introduced 2010 (85% of Americans owned smartphones in 2021)

- **GPS** location technology

- **Online grocery** (expanded to SNAP) and **restaurant ordering** and **payment**

- Grocery and restaurant **pick up and delivery**

- **"Ghost" kitchens**

- **"Groceraunts"** (Supermarket hot food bars)

- **Meal delivery kits**

- **FAFH$** > FAH$

- **Dollar store** expansion (esp. in rural areas)

FoodAPS-2: *FoodLogger*

Capture **higher quality data** and **reduce backend processing time**
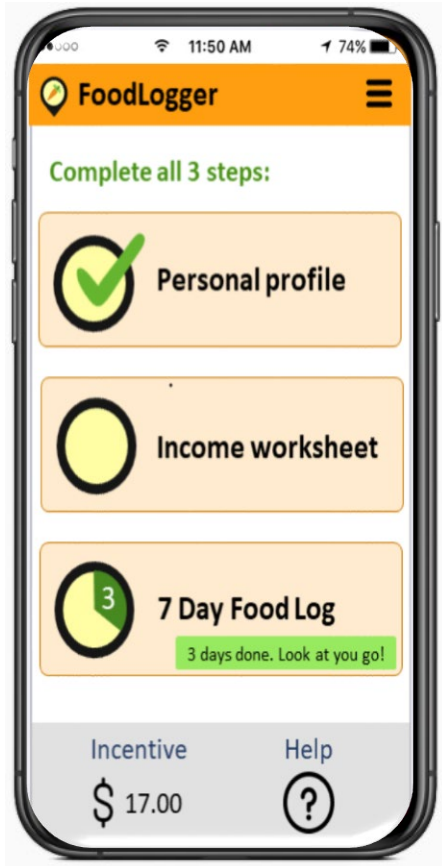
- **Native smartphone application**: Primary mode of data collection

- **GPS-location services:** Real-time links to food places

- **Food item databases and APIs**: Populate drop-down menus of food items

- **Built-in camera:** Receipt and food item picture upload, barcode scan

Comprehensive Data on Food Purchases and Acquisitions

Accurate and *Detailed* Food Item Information
Across *Wide Variety* of
Purchase and Acquisition Events

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Data Needs for Nutrition Assessment

HEI Scoring

- Item weight/portion size
- Ingredients
- Key nutrients
- Whole grain foods
- Food Pattern Equivalents (servings)

Healthful Alternatives

- Low, reduced or zero:
  - Calories
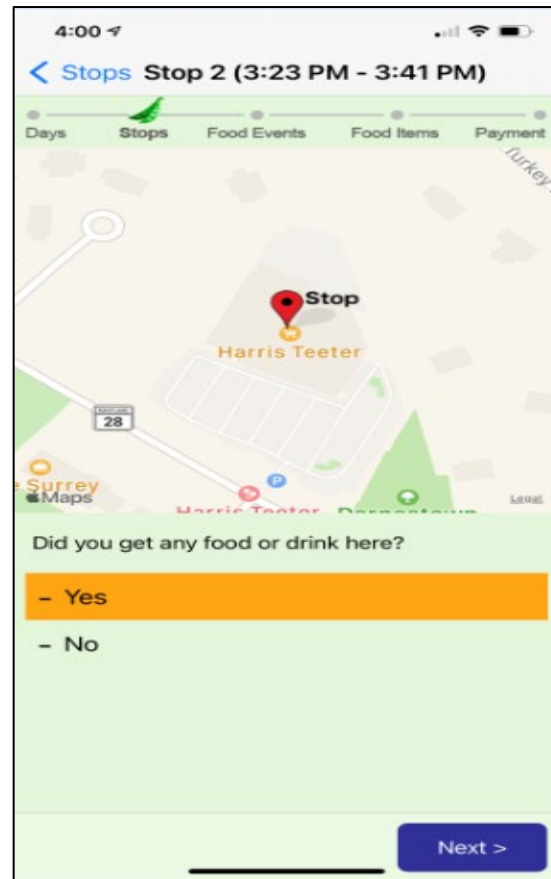 - Fat
  - Sodium
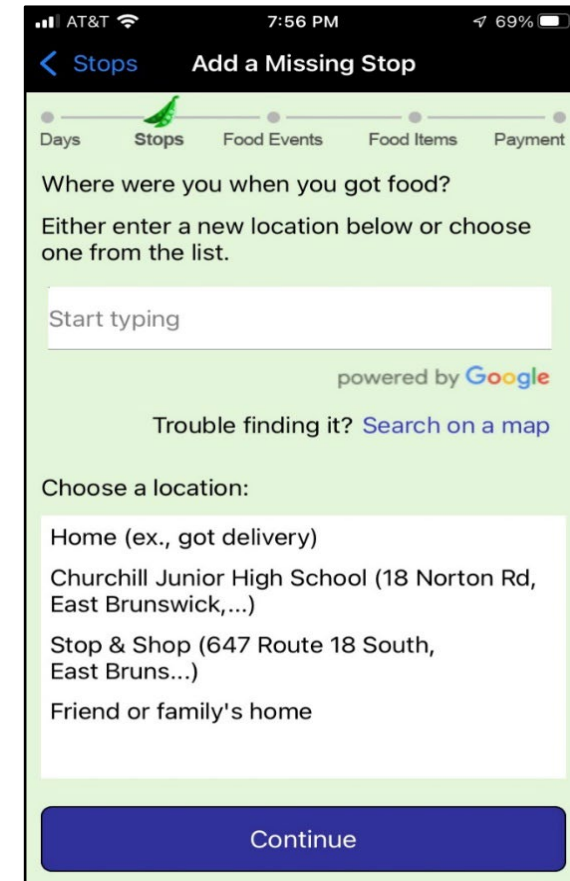 - Added sugars

Where Was the Food Item Acquired?

GPS location service tracks user's stops throughout each day
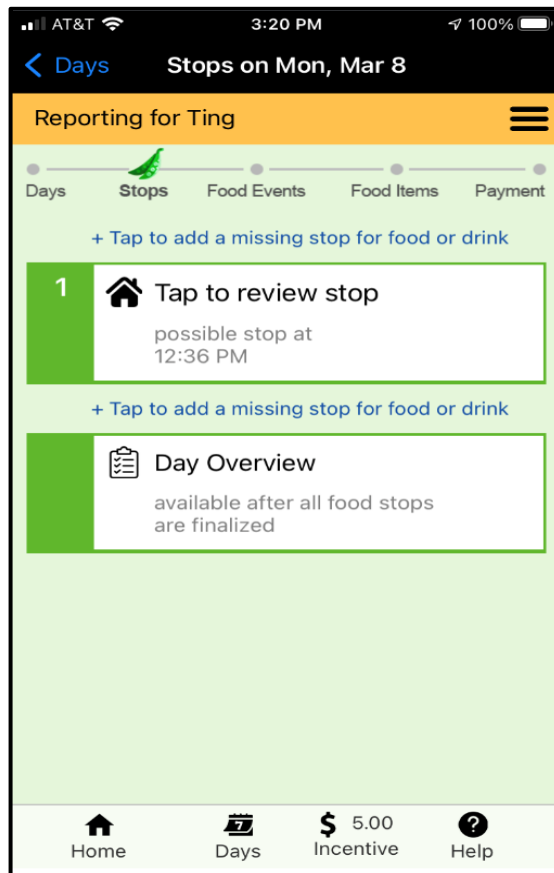
Google Places API
Displays map of potential food place location

Users can **add stops** with prompts from Google Places API

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What type of food place is it?

Foodlogger assigns a
reporting path
using Google Places API

User identifies place type
for places not recognized by
Google Places

FAH	FAFH
supermarket	Café
grocery_or_supermarket	Restaurant
liquor_store	Bar
Drugstore	movie_theater
Pharmacy	night_club
	stadium

12:10

< Stops Spruill Gallery & Gift Shop

Days   Stops   **Food Events**   Food Items   Payment

What type of place is Spruill Gallery & Gift Shop?

A place like a grocery store where you got groceries or other foods or drinks you brought home
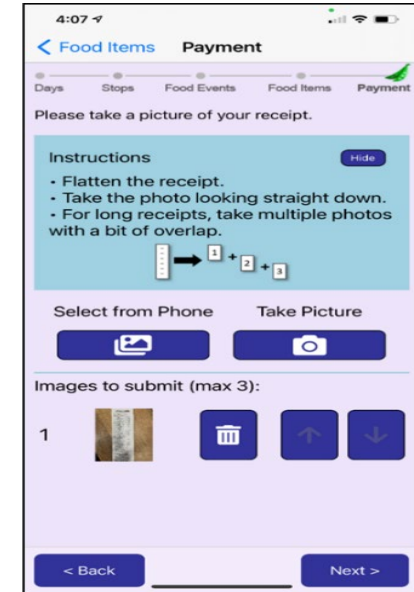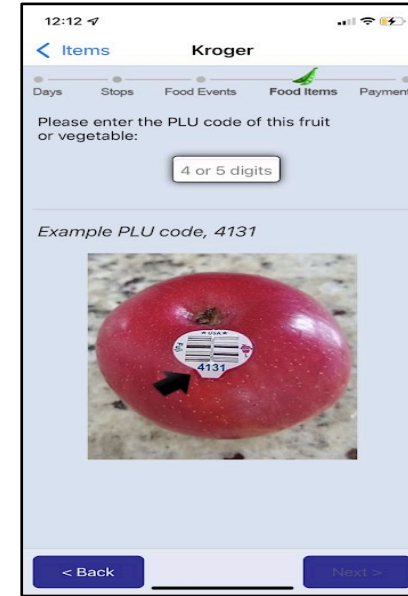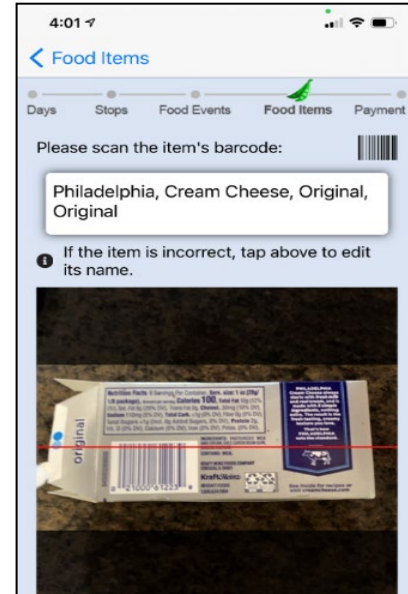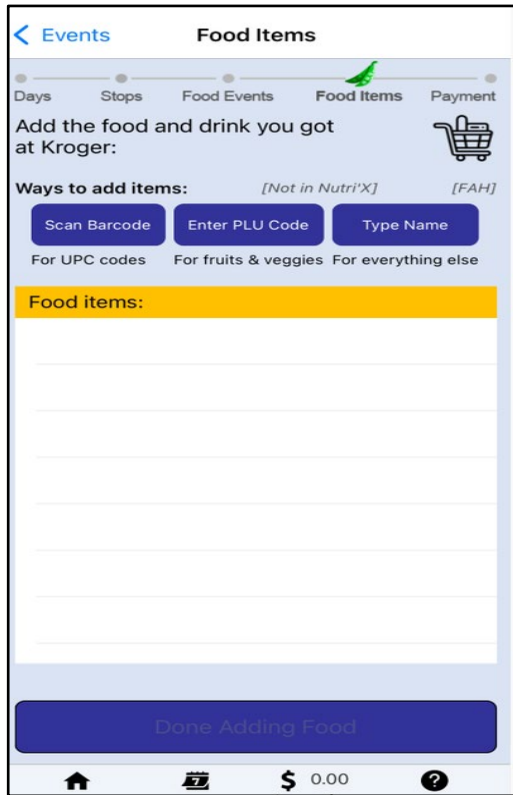
A place like a restaurant where you got prepared meals, snacks, or drinks to eat

Other, please describe:

< Back   Next >

Linking to New External Databases for *Real-Time* Food Item Identification (FAH)

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USDA Global Branded Food Products Database

International Federation for Produce Standards — IFPS

Detailed ingredient and nutrition data for grocery items

GTIN/UPC	Description	Branded Food Category	Brand Owner	Brand	Market Country
021000616886	PHILADELPHIA, CREAM CHEESE SPREAD	Cheese	Kraft Heinz Foods Company	PHILADELPHIA	United States

Portion: 28 g serving

Name	Amount	Unit	% DV
Energy	100	kcal	
Protein	2	g	
Total lipid (fat)	8.99	g	14%
Carbohydrate, by difference	1	g	
Fiber, total dietary	0	g	
Sugars, total including NLEA	1	g	
Calcium, Ca	19.9	mg	2%
Iron, Fe	0	mg	
Sodium, Na	105	mg	4%

Ingredients: PASTEURIZED MILK AND CREAM, WHEY PROTEIN CONCENTRATE, SALT, CAROB BEAN GUM, CHEESE CULTURE

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Linking to New External Databases for *Real-Time* Food Item Identification (FAFH)

Restaurant data
- **Menu** items
- **Nutrition** data

nutritionix
a Syndigo Company

184,933 items from 853 restaurants

Restaurant **receipts**

Credit card receipts

Food item receipts

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Database returns nutrition and portion size information on acquired food item

nutritionix
a Syndigo Company

Chicken McNuggets, 10 Piece
10 Piece

Chicken McNuggets, 20 Piece
20 Piece

Chicken McNuggets, 4 Piece
4 Piece

Nutrition Facts

Serving Size: ⇕ 10 Piece (162g)

Amount Per Serving

Calories 420   Calories from Fat 225

	% Daily Value*
Total Fat 25g	38%
Saturated Fat 4g	20%
Trans Fat 0g	
Cholesterol 65mg	22%
Sodium 840mg	35%
Total Carbohydrates 25g	8%
Dietary Fiber 1g	4%
Sugars 0g	
Protein 23g	
Iron	0%

* Percent Daily Values are based on a 2000 calorie diet.

Nutritionix restaurant database
https://www.nutritionix.com/

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# Assign Nutrition Codes Using NHANES/WWEIA Food and Nutrition Databases

Food and Nutrition Database for Dietary Studies
Converts **food and beverages consumed** in *What We Eat In America* survey into **quantities and nutrients**

- **7,641 individuals** reported **food intake:** 24-hour recall (2017-2018)

- Food and beverage descriptions: **7,083 unique codes** (6,286 foods, 767 beverages)

- Set of **recipes** for **ingredients** and **nutrient calculations**

- **65 nutrients** and **food components**

- Updated **every 2 years**

- **New foods reported,** codes developed

Food Pattern Equivalents Database
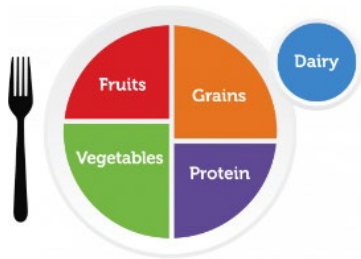
Food Patterns Equivalents Database (FPED)

Converts the foods and beverages in the FNDDS to 37 USDA Food Patterns components

- **Fruits:** citrus, melons and berries; other fruit; fruit juice
- **Vegetables:** dark green; red and orange (tomatoes; other red and orange);
- starchy (potatoes, other starchy); other vegetables; beans, peas and lentils
- **Grains:** whole, refined
- **Protein foods:** meat (cured meat, organ meat); poultry; seafood (high omega-3,
- low omega-3); eggs; soy products; nuts and seeds
- **Dairy:** milk; yogurt; cheese
- **Oils:** naturally present (e.g., fish); added (e.g., olive oil)
- **Solid fats:** naturally present (meat); added (butter)
- **Added sugars**
- **Alcoholic drinks**

Bowman SA, Clemens JC, Friday JE, and Moshfegh AJ. 2020. Food Patterns Equivalents Database 2017-2018: Methodology and User Guide [Online]. Food Surveys Research Group, Beltsville Human Nutrition Research Center, Agricultural Research Service, U.S. Department of Agriculture, Beltsville, Maryland. October 2020. www.ars.usda.gov/nea/bhnrc/fsrg

FoodAPS: Food Item Reporting and Nutrition Analysis

✓ **What**:   Lasagna (meat)
   Place: Neighbor's house

Ingredients:

Lean ground beef	Ricotta cheese	Mozzarella cheese	Parmesan cheese	Onions	Canned tomatoes	Sugar	Whole wheat noodles

Food groups/subgroups

0.38 oz eq. Meat	3.96 oz eq. Solid fats	0.32 cup eq. Dairy		0.02 cup eq. Other vegetables	0.15 cup eq. Red/orange vegetables	0.2 tsp eq. Added sugars	0.60 oz eq. Whole grains
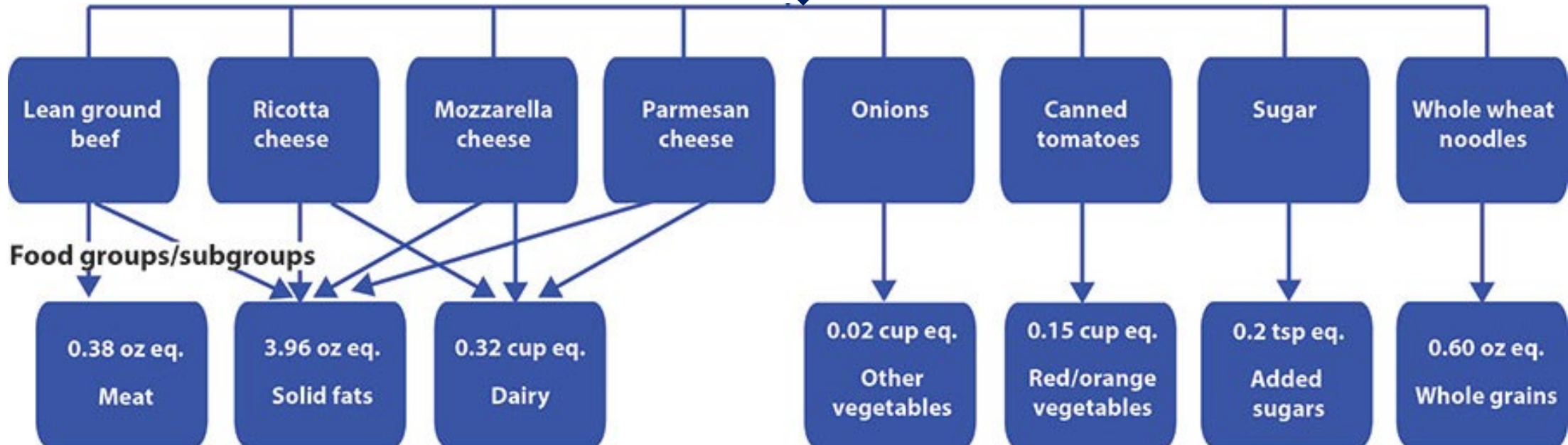
Opportunities for Growth

- **New** or **complex foods** may **lack existing FNDDS codes**

  - **Meal kits** and **foods with multiple components**

  - Foods **as purchased** vs. foods **as eaten**

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