



# USDA's National Food and Nutrient Analysis Program: Progress Report

Holden, J.M., Haytowitz, D.B., Pehrsson, P.R., Exler, J., Trainer, D.  
 USDA-ARS-Nutrient Data Laboratory, Beltsville, Maryland 20705, USA.

## Abstract

The National Food and Nutrient Analysis Program (NFNAP), implemented in 1998, is designed to develop robust estimates of the mean nutrient content of important foods in the food supply and significantly improve the quality of food composition data in the USDA National Nutrient Databank (NNDB). The program objectives are: 1) identification of Key Foods and nutrients for analysis; 2) evaluation of existing data quality; 3) development of nationally based sampling plans; 4) chemical analysis of the foods; and 5) compilation and calculation of representative food composition data. To set priorities for analysis, a ranked list of 1000 foods and ingredients (including 666 Key Foods) for the United States population was developed; data from food consumption surveys were combined with USDA nutrient data to determine a food's relative nutrient contribution to the diet. The sampling plan was based on a self-weighted stratified design; 12 to 24 retail outlets were selected for food pickups and the selection of brands or varieties was based on market shares (as amount consumed). Sample units were procured and analyzed using valid analytical methods and state-of-the-art quality control monitoring. NFNAP is a flexible system that allows cost-effective compositing for large scale sampling. Through additional sampling and analysis of predetermined individual foods and nutrients, a more precise estimate of variability for select nutrients of public health importance was also obtained. To date, NFNAP has supported sampling of over 300 foods and analysis of up to 81 components, including flavonoids, choline, and fluoride. All data are being incorporated into the NNDB and will be available through our website: [www.nal.usda.gov/fnic/foodcomp](http://www.nal.usda.gov/fnic/foodcomp) to consumers, researchers, and the scientific and public health communities.

## National Food and Nutrient Analysis Program (NFNAP)

### 3. Development of nationally-based sampling plan

- Sampling frame based on a national probability model
- 4 Regions
- 3 strata per region
- 2 gCMSAs per stratum
- 1 or 2 outlets per gCMSA

Composite samples analyzed for most foods; Individual samples analyzed for selected foods to determine sample-to-sample variability

- Specialized sampling plans
- Produce: Regional composites
- American Indians – sampling on reservations

### 1. Identification of Key Foods and nutrients for analysis

Uses food composition and food consumption data to identify and prioritize 1000 foods (including 666 Key Foods) and nutrients for analysis. List developed for entire population of the United States. Specialized lists also developed to make sure foods consumed by at-risk populations subgroups are also included: Lists developed:

- African-Americans
- Elderly, 60+
- American Indians
- Children, 0-9
- Hispanic Americans

### 2. Evaluation of existing data quality

Assess status of data for up to 150 food components; where data are lacking; when formulations have changed; and where new analytical methods are available.

- |                               |                  |
|-------------------------------|------------------|
| Foods                         | Food Components  |
| - Mixed dishes                | - Vitamin K      |
| - Fast foods                  | - Phytochemicals |
| - Ground beef                 | - Choline        |
| - Fresh fruits and vegetables |                  |

### 4. Analyze sampled foods under USDA-supervised laboratory contracts

4 Laboratories were qualified for the analysis of traditional nutrients, using these criteria:

- Analytical methodology
- Facilities
- Analyst expertise
- Quality control procedures
- Performance on check samples

Cooperators selected for emerging nutrients bases on expertise:

- Carotenoids and Flavonoids, Dr. Gary Beecher, USDA-ARS
- Selenium, Dr. Kris Patterson, USDA-ARS
- Vitamin E and Folate, Dr. Ron Eitenmiller, University of Georgia
- Vitamin K, Dr. Sarah Booth, Tufts University
- Choline, Dr. Steven Zeisel, University of North Carolina
- Fluoride, Dr. Steven Levy, University of Iowa

### 5. Incorporate new data into USDA databases on NDL's Web site:

<http://www.nal.usda.gov/fnic/foodcomp>

- Annual releases of the USDA Nutrient Database for Standard Reference
- Used in National Food Surveys
- Special interest tables

NFNAP – Progress by Waves

Wave	Date	Types of Foods	Number of Foods	Sampling/Sample Preparation/Analysis	Data Received	Data Review and Processing
0	1/98	Soy, tea	64			
1A	9/98	Mixed dishes, soups, margarine	14			
2A	12/98	Mixed dishes, salad dressings, margarine	21			
2B	3/99	Flour, pasta, rice, margarine, mixed dishes	12			
2C	5/99	Mixed dishes, hot dogs, tomato products	12			
3A	6/99	Mixed dishes, tortillas, orange juice	12			
3B	8/99	Mixed dishes, franks, salsa, crackers	9			
4A	11/99	Spinach, carrots, crackers, mayonnaise	15			
4B	1/00	Snacks, salad dressing, chicken	12			
4C	4/00	Butter, shortening, water, milk, tuna, pancakes and waffles	13			
4D	7/00	Fruit, soft drinks	13			
4E	8/00	Fruit	5			
4F	9/00	Fruit, ground beef	8			
5A	10/00	Fruit and vegetables	6			
5B	11/00	Fruit, eggs	10			
5C	1/01	Nuts, fruit	6			
5D	1/01	Nuts, vegetables	5			
5E	2/01	Nuts, fruits, vegetables	8			
5F	3/01	Nuts, fruits, vegetables	7			
5G	4/01	Nuts, fruits, vegetables	6			
5H	4/01	Nuts, fruits, vegetables	6			
5I	5/01	Nuts, fruits, vegetables	7			
5J	5/01	Nuts, fruits, vegetables	8			
5K	6/01	Nuts, fruits, vegetables	6			
5L	6/01	Nuts, fruits, vegetables	9			
5M	7/01	Fruits, vegetables	7			
5N	8/01	Fruits, vegetables	7			
5O	9/01	Fast Foods	17			
		Total	325			

Completed ■ Partial ■

