

## Nutrient Composition Laboratory

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As part of the recent reorganization of the Beltsville Human Nutrition Research Center (BHNRC), the Food Composition Laboratory acquired its new name. In addition, other laboratories of BHNRC were reorganized, renamed and the direction of research aligned with current diet-health relationships (See Table 1).

Recently, part of the former Human Nutrition Information Service was integrated into BHNRC. These activities include the National Food Consumption Survey, the National Nutrient Data Bank and associated activities. Details of the organization are presented in Table 1.

The research activities of the Food Composition Laboratory (FCL) are an integral part of the National Nutrition Monitoring and Related Research program of the federal government. The ongoing research by scientists at FCL is outlined in Table 2. All research efforts at FCL are focused on the development of new food composition data as well as the improvement of existing data. Specifically, food analysis and the development of analytical methods and instrumentation are oriented toward those nutrients and food components associated with the reduced risk of diet-related diseases. Efforts in the improvement of data quality emphasize three areas of research, data evaluation, food sampling and reference materials (Table 2).

Research in several areas will be reactivated or started in the near future (Table 3). Again, each of the nutrients or food components identified with these research thrusts are associated with diet-related disorders or diseases. Research on these food components will be conducted collaboratively with scientists at the University of Minnesota, National Center for Health Statistics and Iowa State University. All research that has the potential to impact on the activities of the Nutrient Data Laboratory (USDA Handbook No. 8 and Nutrient Data Bank) is conducted collaboratively with scientists and staff of that group.

The Food Composition Laboratory has been well represented by its scientists and staff at national and international meetings, symposia and workshops. A list of scientific publications for Calendar Year 1993 is attached. Copies of each publication are available upon request.

**Table 1.**  
**Organization of Beltsville Human Nutrition Research Center**  
**Center Director - Dr. Joseph Spence**

**Diet and Human Performance Laboratory**

Research Leader - Dr. Joseph Judd  
Define healthy diets through studies with human subjects.

**Metabolism and Nutrient Interactions Laboratory**

Research Leader - Dr. Judy Hallfrisch  
Ascertain metabolism of specific and combinations of nutrients and food components.

**Nutrient Requirements and Functions Laboratory**

Research Leader - Dr. Orville Levander  
Define dietary requirements for individual nutrients and food components.

**Food Composition Laboratory**

Research Leader - Dr. Gary R. Beecher  
Develop new and improved analytical techniques and other systems for the improvement of food composition data.

**Nutrient Data Laboratory**

Acting Research Leader - Dr. Wayne Wolf  
Collate, tabulate and disseminate data on the composition of foods.

**Survey Systems and Food Consumption Laboratory**

Acting Research Leader - Ms. Alanna Moshfegh  
Conduct national food consumption surveys and disseminate information relative to the intake of foods, nutrients and other food components by the U.S. population

## **Table 2. Current Research Activities at the Food Composition Laboratory**

### **Measurement Systems Development** (Includes extraction/digestion, sample cleanup, separation/quantification).

Cholesterol  
Dietary fiber  
Fatty acids  
Flavonoids  
Minerals  
Tocopherols and tocotrienols  
Vitamin C

### **Instrumentation Development**

Minerals - Simultaneous multi-element; organic/non-organic speciation

### **Improvement of Data Quality**

Data evaluation - Development of systems for the critical evaluation of the quality of analytical data

Food sampling - Development of demographic and statistical based schemes

Reference materials - Research on organic nutrient stability

### **Food Analysis**

Carotenoids in tomato products

**Table 3.**  
**New Research Areas at the Food Composition Laboratory**

<b>Carotenoids</b>	Develop analytical methods for moderate and high fat foods Update database
<b>Folate</b>	Develop extraction and analytical methods
<b>Isoflavonoids</b>	Measure levels in soya-foods and other legume foods Develop database

**FOOD COMPOSITION LABORATORY  
PUBLICATIONS**

January 1, 1993 - December 31, 1993

Anderson, E.M., Angyal, G.N., Weaver, C.M., Felkner, I.C., Wolf, W.R. and Worthy, B.E. (1993). Potential Application of LASER/Microbe Bioassay Technology for Determining Water-Soluble Vitamins in Foods. *J.A.O.A.C. Int'l.* 76(3):682-690.

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Li, B.W. and Cardozo, M.S. (1993). Simplified Enzymatic-Gravimetric Method for Total Dietary Fiber in Legumes Compared with a Modified AOAC Method. *J. Food Sci.* 58(4):929-932.

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Miller-Ihli, N.J. (1993). Advances in Ultrasonic Slurry Graphite Furnace Atomic Absorption Spectrometry. *Fres. J. Anal. Chem.* 345:482-489.

Miller-Ihli, N.J. and Greene, F.E. (1993). Direct Determination of Lead in Sugars Using Graphite Furnace Atomic Absorption Spectrometry. *At. Spect.* 14(4):85-89.

Riby, P.G. and Harnly, J.M. Characterization of a Helium Discharge for Hollow Anode Furnace Atomization Non-thermal Excitation Spectrometry. *J. Anal. At. Spect.* 8:945-953.

Russell, L.F. and Vanderslice, J.T. (1992). Non-degradative Extraction and Simultaneous Quantitation of Riboflavin, Flavin mononucleotide, and Flavin Adenine Dinucleotide in Foods by HPLC. *Food. Chem.* 43:151-162.

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