

The Future of the National Nutrient Data Bank

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The increased and widespread awareness of consumers about food components (e.g. trans fatty acids, vitamin B6, cholesterol, antioxidants) and their possible positive or negative effects on human health emphasize the important role of food composition data in society today. The scientific community, including representatives of the food industry, academia, and government agencies use food composition data for a variety of purposes to maintain an adequate, varied and safe food supply. The USDA National Nutrient Databank provides for the nation the foundation of high quality food composition data. The National Nutrient Databank is developed and maintained by The Nutrient Data Laboratory (NDL).

During the period of 1994 - 1995 the Nutrient Data Laboratory has undergone significant changes. The Laboratory was moved from the former Human Nutrition Information Service, Nutrition Monitoring Division to the Agricultural Research Service, Beltsville Human Nutrition Research Center (BHNRC). BHNRC is one of five human nutrition centers within ARS which emphasize human nutrition research. The Centers are located in Beltsville, MD, San Francisco, CA, Houston, TX, Boston, MA and Grand Forks, ND. Laboratories within the BHNRC conduct clinical, metabolic, and epidemiological human nutrition research, as well as conducting the USDA nationwide food consumption surveys of dietary intakes, and surveys of diet and health knowledge. In addition the Food Composition Laboratory evaluates, modifies and develops chemical methods for the analysis of components in foods. With this reorganization USDA's food composition research has been consolidated in BHNRC.

The Nutrient Data Laboratory has physically moved from its previous location in Hyattsville, Maryland to a new location in Riverdale, Maryland near the College Park Metro station. The new address is:

4700 River Road, Unit #89
Riverdale, Maryland 20737
Phone: 301-734-8491 Fax: 301-734-8498

The new number for the USDA bulletin board is 301-734-5078. The internet address (info-12@info.umd.edu) has not changed.

USDA has been involved in the generation of food composition data since W.O. Atwater and C.D. Woods generated the first chemical data for protein, fat, and carbohydrate for a variety of foods. During the 1920's - 30's tables were published on the proximate content of beef, fruits, and vegetables. In 1940 food composition tables for eleven nutrients for a number of foods were published to assure an adequate food supply for the military and civilian populations. The well known "red book" or USDA Agriculture Handbook 8, "Composition of Foods", Revision 1963 represented the expansion of the tables to 20 components and 2483 foods. These data were released at the same time as punch cards and represented the first available computerized version of food composition data.

Between 1976 and 1993 the Agriculture Handbook No. 8 was revised by food group to provide 21 volumes of information. Subsequent updates of data for selected foods and components are available. The primary database product of the NDL is the Nutrient Database for Standard Reference. It contains composition data for more than 5,000 raw and cooked foods and up to 82 components, including proximates, minerals, vitamins, fatty acids, and dietary fiber. The database identification number, short and long food descriptions, and information about household weights and weights of refuse are included. Version 10 of the Nutrient Database for Standard Reference has been available since 1993. Version 11 will be released early in 1996 and will be available on the USDA bulletin board and the Internet. Many printed volumes for various food groups are no longer available. The USDA is currently evaluating the need for the release of printed food composition materials and would appreciate user input.

Food composition data are obtained from USDA contracts, from the food industry, and from laboratory reports from other federal research laboratories. Literature sources provide an important addition to the database. In the future food industry data will be acquired electronically. NDL has participated with representatives of the International Food Service Distributors Association in the development of the expanded IFDA Standard Format for Data Exchange. The release of Version 3.0 of the IFDA format includes record formats for documentation of analytical methods, quality control procedures, sampling methods, and sample handling procedures. Development of a standard format is the first step in the development of a national clearinghouse for food composition data.

Other NDL products include the Primary Data set, (PDS) a database of food composition data for approximately 2500 entries for items used as foods or as food ingredients. The PDS is used to calculate the Survey Nutrient Database, the food composition database containing approximately 7000 foods and 30 nutrients used to estimate the intake of nutrients in the USDA food consumption surveys conducted by the Survey Systems/Food Consumption Laboratory (SS/FCL), and to develop the food composition database for the National Health and Nutrition Examination Surveys (NHANES). The PDS for the Continuing Survey of Food Intakes by Individuals 1994 will be released at the end of 1995.

The National Nutrient Database for Child Nutrition Programs is a new database product developed in collaboration with the SS/FCL at the request of the Food and Consumer Service (FCS) to support a new nutrient-based approach to the USDA school lunch program. Special purpose data files have been generated for food components such as sugars (1987), vitamin K (1993), vitamin D(1991), selenium (1993), and trans fatty acids (1995). The data may be more limited in the numbers of foods or numbers of samples analyzed but represent the results of studies to provide good quality food composition data for specific components or groups of foods.

The NDL will continue to provide leadership in the development of factors and standard definitions for the determination of derived values for food components. In the past USDA scientists were responsible for developing factors such as those for calculating the protein level from the nitrogen content of a food or for the retention of nutrients after foods were cooked or processed. As newer analytical methods are introduced and as new foods and preparation methods are used the NDL will reevaluate the existing factors and the possible needs for new research in this area. Also, NDL staff will assess the statistical characteristics of data sets for components and foods in order to improve estimates of component levels in the food supply.

The NDL has maintained a frequent dialogue with nutrition scientists from other regions and countries of the world concerning the development and use of food composition data. Many developed and developing nations are directing more fiscal and scientific resources to the expansion of food composition databases due to the increased complexity of the global food supply, the importance of international food trade, and the recognition of the important relationship between dietary intake and health status. Scientists within NDL will continue to participate in the global activity concerning the improvement of data quality. During the last few years representatives of the NDL have participated in international and regional food composition discussions concerning the assessment of data quality, the improvement of food composition data for developing countries, the development of a standardized approach to food description, terminology, and nomenclature and other topics. These meetings have been organized by the INFOODS (International Network of Food Data Systems), in collaboration with the Food and Agriculture Organization (FAO), and the International Union of Nutritional Sciences (IUNS). The "globalization" of the food supply and the recognition of common research issues regarding food composition requires that NDL continue to participate in this forum.

To date USDA food composition data have been disseminated in the form of printed tables and pamphlets to meet the needs of professional and non-professional users. As previously mentioned many of the 21 volumes of USDA Composition of Foods: Raw, Processed, and Prepared are out-of-print. Since 1990 data have been distributed electronically on the USDA Bulletin Board and, more recently, they have become available on the internet. (The reader is referred to the manuscript in this publication by David Haytowitz entitled "Using Internet and Electronic Bulletin Boards for Food Composition Data.") NDL will continue to emphasize the electronic release of data for all users. The USDA National Nutrient Databank is currently maintained on the USDA mainframe system in Kansas City, Missouri. The Databank System was first developed in 1975 and was updated in 1984. However, in view of the technological advances in computer hardware and data management software the Databank System does not meet the needs of USDA food composition specialists or data users. Plans for a complete re-design of the Nutrient Databank System are being developed to permit more effective management of USDA food composition data in the near future.

NDL will continue to acquire data from USDA contracts, as resources permit. Data will also be collected from other scientific literature and government sources. However, the food industry generates and maintains a large amount of food composition data for brand name products and, to a certain extent, for food ingredients. NDL will continue to work with the food industry to acquire high quality analytical and calculated data for inclusion in the National Nutrient Databank. Efforts will focus on the accession of electronic data streams from the food industry in view of the important role of processed and prepared food products in the American diet.

Development of USDA contracts for food analysis will be based on the Key Foods approach developed by nutritionists at the NDL. (The reader is referred to the manuscript in this publication by Pamela Pehrsson entitled "Development of a Key Foods List for Establishing Priorities in Food Composition Research") Use of the Key Foods Approach to set priorities for foods to be analyzed will make the best use of scarce resources.

In the continuous updating of food composition data, NDL staff must assess the quality of data. NDL will continue to develop specific criteria pertaining to the sampling plan, sample handling, analytical method, analytical quality control, and statistical characteristics of the data

set, to evaluate the quality of data in the National Nutrient Databank, and will provide data quality indicators so that data users can select those data which are suitable for a specific use.

In summary the Nutrient Data Laboratory recognizes that the food supply is dynamic. Foods will continue to change. As we learn more about the relationships between food intake and health status public health priorities will change. In order to meet future challenges the NDL will continue to compile, evaluate, and disseminate food composition data to provide accurate and representative estimates for components in foods. Short and long term priorities will be based on sound scientific approaches to address food composition issues.