

REPORT OF AN INTERNATIONAL MEETING:
INFOODS
INTERNATIONAL NETWORK OF FOOD DATA SYSTEMS

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Five months ago, during January 30 to February 5, 1983, a significant international planning conference was conducted to discuss the need for and development of a world-wide food data networking organization, to be called INFOODS, for International Network of Food Data Systems. The conference, which was held at the Rockefeller Conference and Study Center in Bellagio, Italy included participants from government, industry, academia and nutrition, health and agricultural institutes in a number of countries in North and South America and western Europe. Co-chairmen of the meeting were R. Gaurth Hansen, Utah State University and Vernon R. Young, Massachusetts Institute of Technology.

The immediate objectives of the INFOODS planning conference were to explore and develop relevant topic areas and to define needs and strategies leading to the establishment of a standardized, high-quality, readily accessible food data bank systems network. In order to meet this challenge, a series of pre-determined, but not necessarily inclusive, issues were raised for consideration. Among the issues addressed was the need for world-wide information on the chemical composition of foods and the desirability and feasibility of meeting this need on an international level. Also discussed were the difficult problems that must be faced in generation of quality food composition information; the development of a structure for standardizing data entries, records and files; and a method of systemitizing them in a way which will facilitate the user without exceeding the limits of current technology.

USER NEEDS

Food composition data are of value to many public and private agencies and individuals, including governments, food industries, research and educational institutions, physicians, dietitians, and increasingly, at least in the United States, the food-consuming public. The needs of these different users with respect to both data base content and form are necessarily varied.

A few of the uses identified by conference participants include:

- Performing nutritional assessments, diet evaluation and planning for normal populations and those with special needs
- Developing dietary standards of reasonable and adequate nutrient intake
- Identifying food and nutrient consumption patterns of population groups, evaluating the adequacy of consumption and trends over time
- Identifying relationships between food and nutrient consumption practices and the incidence of degenerative diseases such as heart disease and cancer

- Developing dietary guidance tools and education programs for individuals and populations
- Facilitation of the food and agricultural industries in their efforts to provide a nutritious, safe and acceptable food supply
- Facilitating governmental regulation of the food supply and maintenance of nutritional quality
- Establishing standards of identity for traditional foods, requirements for imitation foods and standards for labeling and advertising claims
- Determining interactions between nutrients; and toxicological, pharmacological and other aspects of the diet
- Assessing changes in the nutrient/contaminant/substance content of the food supply

Given the variety of needs and users and major differences in foods and their preparation in different regions of the world, it was essential to address the question of whether or not it is feasible or even desirable to establish an international food data bank system. As a result of the INFOOD planning conference it is possible to say yes to the second question--it is desirable--and, given commitment and participation by the international scientific community, it may even be feasible.

WHAT INFOODS HAS TO OFFER

The first major step is to define what INFOODS is to be. Many countries have their own national food and nutrient data bases. There are also a number of public and private data bases housed in various agencies and institutes throughout the world. Although these systems may not be meeting all the needs of their respective users, generally efforts are being made to update and revise data to keep pace with new analytical techniques, with professional interest in an increasing number of nutrients, contaminants and other food components, and with the continually changing nature of food supplies. It is unrealistic to expect in the near future that existing data bases will be modified and merged to form one large single international data base.

The question then becomes what can INFOODS--both as an international data base system and as an organization--offer to potential users? What can INFOODS contribute over and above what is already being provided by public and private data bases to those who need and use them?

One of the primary contributions can be to provide direction and assistance to those countries and regions of the world currently without data base systems. This is particularly important in developing areas of the world where the resolution of food and nutritional problems is impeded by the scarcity of reliable data on the nutritional value of local foods. The food composition data which are available in Latin America, for example, are scattered among a number of tables prepared in different countries and much of the information is unpublished. There is also a lack of uniformity among tables in the way in which data have been obtained, organized and presented.

The Food Composition Table for Use in Latin American was compiled and published by INCAP-ICNND in 1961 to "meet an urgent need for expressing all available analytical data in a uniform manner and assembling them into a single table in which foods could be identified by their scientific name or by any one of their popular names." These data have not been updated in the 20 years since they were published and do not necessarily represent foods currently being consumed. Similar problems exist in other developing regions of the world.

At present there is no internationally organized effort to develop a standardized system to collect and process food data for common use in a developing regions, although the data would be valuable and used if available. INFOODS has the opportunity in these regions to provide leadership in formulating international standards and guidelines for the development of new food data systems in order to assure compatibility among new systems and facilitate data exchange.

Another area where INFOODS can play a unique role is in the provision of world-wide accessible data on foods commodities used in international trade and commerce. One participant at the INFOODS conference indicated that his country must import wheat from a number of other countries in the world. As there is a concern regarding selenium nutriture in his country, he is obliged to sample each boat load of wheat at the docks and analyze it in his laboratory for selenium, so as to have a measure of levels of this nutrient in the food supply. He may well have the best data in the world on selenium content of different varieties of wheat produced in different regions of the world. But how much more useful and convenient it would be for him and others to have access to the data from a computer terminal, either for determining nutrient composition after importation or for use in decision-making before finalizing trade agreements regarding food commodities. Nutrient composition data on foods of international commerce would be invaluable to those countries for which food security is a national concern, because of their vulnerable trade positions and dependence upon food imports to meet the basic energy needs of their populations.

Undoubtedly, one of the most immediate and critical needs in the realm of food nutrient data bases today, is that of standardization. Currently, data bases are internally consistent at best. Because of differences in nomenclature and in kinds and number of foods and food components included, it is difficult, if not impossible, to use more than one data base interchangeably or for supplementary or verification purposes. These problems are compounded by lack of documentation to indicate how or where the data were obtained or how reliable the data entries are. Without some type of standardization, documentation or guidelines, it can only be expected that food composition data bases will become less and less compatible, thus further limiting the use of food component data as a resource for international cooperation and investigation. Guidelines are needed for the generation, compilation and reporting of food component data; for data quality indices based upon sampling procedures, analytical methodologies and lab practices; for criteria for accepting data from laboratories or the literature and for imputing values; and for uniquely naming and classifying foods and food components.

TASKS FOR INFOODS

The consensus of the INFOODS conference group was that information on the composition of foods throughout the world contributes significantly to a variety of national and international activities. However, these activities are being hampered by:

- the limited amount of current, reliable, easily accessible data on the composition of the foods of the world
- the lack of compatibility among the existing food composition data bases
- the lack of national/international standards and guidelines for gathering, storing and disseminating food composition data
- the amount of food composition data being gathered by inadequate and conflicting techniques

In order to address these issues the conference working groups made a number of recommendations as to tasks that should be undertaken by INFOODS.

The working group concerned with user needs suggested that INFOODS be responsible for organization and coordination of an expert group to detail the specific needs of the communities of users for food composition data. This expert group should include representatives from the international community and involve participation by the food industry and governmental administrations. Another suggested task was organization and coordination of an expert group to consider what specific data bases and subsets of worldwide food composition data now exist or would be of value to the mission of INFOODS. Here special attention should be paid to problems unique to developing regions in the world.

The working group which considered data base content, suggested that INFOODS be responsible for formation of an expert group to examine methods and criteria and to develop guidelines for extracting archival data from the literature and alternative sources. This expert group should consider the critically important question of criteria for accepting data into any food component data base. Also suggested by the working group was the implementation of a global survey of existing data bases and banks of ongoing and future collection efforts.

A third working group considered the question of how to gather necessary data, insuring its accuracy and completeness. They suggested that INFOODS organize and coordinate an expert group to explore the issue of quality of data and, specifically, to update current guidelines for the preparation of tables of food composition. It was recommended that an updated publication of such guidelines should cover at least: (a) generation of food composition data by analysis (direct method), including sampling methods, food laboratory practice (reference food material, quality control, procedures, modes of expression of data and standardization of conversion factors, and approaches for data appraisal and interpretation; (b) use of food composition data from other sources (indirect method) involving using data from the original literature and calculating and imputing analytical values and (c) training of analysts for food composition data generation.

This working group also suggested selection of an expert who could devote 6-9 months on a full-time basis to researching and preparing an updated text of the proposed guidelines. This individual would undertake visits to laboratories in developing and industrialized countries prior to the period devoted to full-time text preparation. Another suggestion was that INFOODS investigate the establishment of a program of training fellowships to enable the broader development of skill and expertise in all areas directly concerned with food composition. Specifically, mechanisms should be developed by INFOODS, through international agencies and other suitable organizations, to facilitate the implementation of this fellowship program.

Also recommended was the investigation of the feasibility of establishing an international journal devoted to food composition studies. It was proposed that a journal would facilitate adoption of guidelines by the scientific community, serve as an information source for any future revision of the guidelines, and would provide a means for dissemination of findings and critical reviews in all areas of food composition research.

A fourth working group was asked to consider data base organization and content with respect to the diversity of data required and the problems which arise in managing these data. These are guidelines which could be used by new, developing data bases if desirable. This group suggested that INFOODS organize and coordinate an expert group to establish nomenclature and a system of coding to be used in INFOODS. The expert group should plan, define and recommend terms for: identifying food and food components, units of expression, analytical methods, preferences, locations, environmental conditions, and others. Membership of this group should include individuals with knowledge of foods in international trade and raw and processed foods in developed and developing countries.

Also suggested was that INFOODS organize and coordinate an expert group to explore and plan the informational networking system aspects of INFOODS. This group should (a) develop a system concept in terms of data flow, data regulation and information services to be provided; (b) discuss with existing centers those prepared to serve as INFOODS regional centers with a view to determining how they are to be integrated into an overall system concept and how their current structure and modes of operation influence the networking concept; (c) develop a planned implementation plan. A third recommendation of this working group was that INFOODS organize and coordinate an expert group to develop information interchange standards for food composition data. This group should develop a standard format and set of conventions for the interchange of food data between regional centers and, if desired, between laboratory and regional centers. The format arrived at should be usable in communicating with both large and small systems and should be designed independently of internal formats of any particular machine.

IMPLEMENTATION AND MANAGEMENT

In order to implement the recommendations made by the various working groups, a fifth working group explored the organizational framework necessary to plan and develop the structure and functions of INFOODS. It became obvious at the conference that INFOODS needs to have several very different aspects. It needs to be (1) a network of regional data centers; (2) an organizational and administrative framework for various expert task forces; (3) the generator (commissioner) of special international data bases; (4) a general and specific resource for persons and organizations interested in food composition data on a worldwide basis.

The conference group proposed that such an organization be set up to assist in the improvement of the state of food composition data around the world. This organization, called INFOODS, for International Network of Food Data Systems, would establish an international network of food composition data bases, identify all possible additional sources of food composition data, and direct and coordinate the development of guidelines and standards for the collection, storage and interchange of food composition data.

MISSION

The mission of INFOODS is to promote international participation and cooperation in the acquisition and dissemination of complete and accurate data on the nutrient composition of foods, beverages and their ingredients, in forms appropriate to meet the needs of government agencies, nutrition scientists, health and agriculture professionals, policy makers and planners, food producers, processors and retailers, and consumers.

ORGANIZATION

It was agreed by the participants that the INFOODS organization would consist of a secretariat (Dr. William Rand, executive secretary) guided by an executive committee and advised by a policy committee (Dr. Vernon Young, chairman of both), to be headquartered at the Massachusetts Institute of Technology. This executive committee will help to set up regional liaison committees in specific geographic areas.

The organization at this point has three major functions: (1) to serve as an active clearing house for information on all aspects of food composition data; (2) to establish an international network to facilitate communication between existing data bases; (3) to sponsor task forces needed to carry out its mission of improving the state of food composition data.

POST-CONFERENCE ACTIVITIES AND PLANS

The United Nations University (UNU) has agreed to serve as the sponsoring agency and INFOODS has been approved by the UNU council as long term project of its Food, Nutrition and Poverty Program. Close working relationships are being established and FAO and WHO. FAO has a continuing responsibility for the development and distribution of regional food tables and INFOODS has a mandate to cooperate with FAO in this task as desired by them. Similarly, FAO and WHO have responsibility for the Codex Alimentarius and INFOODS will not initiate any activities that would infringe on it but will cooperate with FAO and WHO as they consider appropriate.

Dr. William Rand met with a European data base group in Amsterdam at the end of May and plans to meet with Latin American representatives in Miami in August 1983, and with Asian representatives in November, 1983 to organize regional committees to aid and assist INFOODS.

A regional liaison committee has been set up for Northern America with the proposed responsibilities of assisting INFOODS by (1) gathering of data within the region, (2) identifying personnel and technical resources, (3) identifying special problems, needs and resources, (4) helping to obtain funding, and (5) contributing to policy decisions with its chairman serving on the INFOODS policy committee. Dr. Alex Campbell, Food and Nutrition consultant in Ottawa Canada is the chairman and Dr. Frank Hepburn from USDA Human Nutrition Information Service is the secretary of this regional committee.

Most of the other activity since the planning conference has been directed toward exploring and formalizing the recommendations that were made by participants and working groups. As a result of these recommendations the following activities have been planned:

- A survey of existing data bases to lead to a directory of international food composition data bases that will be the forerunner of the network. INFOODS will be able to provide information on the existence, quality, accessibility of specific food composition data around the world. This will be an ongoing activity, and the first directory is expected within a year.
- A data quality task force, to develop criteria and guidelines for the quality of entries in food composition data bases. This effort will include examination of sampling, analytical methodologies, good laboratory practices, modes of expression of data and conversion factors, as well as criteria for accepting data from the literature and for calculating and deriving data from analytical values. A task force has been organized for this effort with a report expected within a year. Dr. David Southgate of the British Agricultural Research Council is the chairman.
- A classification and nomenclature task force to examine the problem of uniquely characterizing food and food components to include (a) a review and evaluation of existing nomenclature systems and methods of classification and descriptions, and (b) the recommendation of international standards.
- A data base form and content task force to develop international guidelines for the content and form of an "ideal" data file, to include (a) items and components to be included, (b) additional information needed in the data file, and (c) logical formats of data records and files for storing, transferring, and distribution of food composition data.
- An information systems task force to advise on the design and to monitor the information systems aspects of INFOODS and the regional FOODS; to consider initially (a) the constraints that the data bases, users, and gatherers of the data put on the system and (b) the limitations that technology and being part of a network put on the individual components. Dr. Wolfgang Trebejahr of WHO is the chairman.
- A task force to survey the users of, and needs for, food composition data to include (a) magnitude and types of users and how frequently they use the data, (b) what data are most frequently used, requested or needed, and for what purposes, (c) what unmet needs for food composition data exist, and why these needs are unmet, and (d) what sort of network could best serve the users.

- Setting up and coordinating additional task forces as recommended by the policy committee as being essential for the mission of INFOODS.
- Organization of regional liaison committees for support of INFOODS by identifying special problems, needs and resources of specific geographic regions. It is hoped there will be liaison committees to represent the interests of South American, Europe, Asia, Africa and others.
- Investigation of the feasibility of establishing an international journal with the working title, "INFOODS - An International Journal of Food Analysis, Food Composition and Food Data Systems," that would provide a focus for the publication of research and the dissemination of information in the broad field concerned with the generation, processing, and use of food consumption data.

The success of INFOODS and the contribution it will make depends upon the extent to which you, the participants in the 8th Annual Nutrient Data Base Conference, and others in the scientific community contribute to its development. INFOODS welcomes any suggestions, expertise, time and other resources that you have to offer.

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