Using International Nutrient Data

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This talk will introduce OCEANIAFOODS, and identify nutrient data products available from countries within OCEANIAFOODS and in what form they may be obtained. More importantly, this presentation will discuss the problems associated with international interchange of data, and some of the possible solutions to these problems.

INTRODUCTION

OCEANIAFOODS regional group of INFOODS includes the countries Australia and New Zealand; and Papua New Guinea, Fiji, and the smaller Pacific Island countries represented by the South Pacific Commission in New Caledonia.

Australia is represented by a few major groups. The Department of Community Services and Health is responsible for developing the national nutritional database and its associated computer and printed products. The Australian Government Analytical Laboratory is responsible for much of the nutrient analyses work, along with researchers from the University of New South Wales and other organisations.

New Zealand is represented by the Department of Scientific and Industrial Research, which develops the national food composition databases, and conducts and coordinates the nutrient analyses work. Analyses are also conducted by the NZ Dairy Research Institute, Meat Industry Research Institute of New Zealand, and a few universities.

The South Pacific Commission operates the Pacific Island Food Composition Programme. Development of the nutrient database for the South Pacific and production of printed materials takes place at the Commission site. *In Fiji, the analytical work is conducted at the Institute of Natural Resources, University of the South Pacific; and in Papua New Guinea,* analyses are conducted at the Department of Agriculture and Livestock, Port Moresby and the National Analytical Laboratory, University of Technology, Lae.

FOOD COMPOSITION DATA PRODUCTS

From Australia

Products currently available include the printed *Composition of Food, Australia*, in five volumes to date (1-5); NUTTAB series, data files (6); and the recently released book *Nutritional Values of Australian Foods* (7).

From New Zealand

Products currently available in New Zealand include the Food Composition Database as compressed datafiles on disk (8), datafiles with simple application software (9) and more advanced software (10), printed unabridged *New Zealand Food Composition Tables* (11), and users' guides for all products. There are three volumes in the *Composition of New Zealand Foods* series of books completed (12-14), with another several pending. Additionally, there is a consumer-style book with data on seven nutrients (15), and a book on the proximate composition of nearly 100 NZ fish species (16).

From the South Pacific

Products available from the South Pacific Commission include newsletters, leaflets and information circulars on Island food and its composition. It is hoped that in the near future, the Pacific Island Food Composition Database will be available. This work is funded by international aid agencies, and has been continually cut in favor of other health projects such as Aids prevention.

PROBLEMS WITH INTERNATIONAL INTERCHANGE

Within our own countries we have only the typical problems experienced by all database developers. When we engage in intra-regional interchange we need to address other problems, and when contemplating international interchange we are faced with still more problems.

The types of problems

1. Naming of foods has long been acknowledged as a source of difficulty in development and use of extra-national food composition tables. Language is a problem, but even in the English language there are many differences between British English and American English. Australia and New Zealand would lean more toward British English, but still have unique descriptors for foods which can be confounding for other users. For example, the food record "New Zealand pumpkin" is not at all what is known to North Americans as pumpkin. The problem of naming or describing foods is being addressed by international bodies.

2. Naming of nutrients is potentially a more serious problem. A simple comparison between the USDA, the Australian, and the New Zealand tables shows some confusing anomalies. For example New Zealand lists a food component as "Available carbohydrate" and Australia and USDA list a component as "Carbohydrate, total". Although named differently, the Australian and the New Zealand (both of which exclude dietary fibre) are more similar than the identically-named Australian and USDA (which is calculated by difference and includes dietary fibre). This issue has been addressed by INFOODS in the book *Identification of Food Components for INFOODS Data Interchange* (17). In a datafile, each of these components would receive a different identifier: USDA's would be <CHOCDF>, which is "carbohydrate, total; calculated by difference"; Australia's would be <CHOAVL>, which is "carbohydrate, available"; and New Zealand's would be <CHOAVLM>, which is "carbohydrate, available; expressed in monosaccharide equivalents". The values all represent different things, and without the use of specific identifiers, international interchange will lead to dramatic misinterpretation of data by users in different countries.

3. Method of analysis is another problem area, which is partially addressed in the naming of nutrients. The most discussed component for which different methods yield very different values is dietary fibre. The above-mentioned INFOODS book also addresses this by listing eight different tagnames for fibre based on method, including method "unknown". This is essential for interchange, but also useful within a country where data presented as dietary fibre have been determined by more than one method.

4. Units used can also present a problem. When users are familiar with their own country's units for nutrients it is easy to miss a difference when using data from other countries. For example, manganese is expressed in milligrams by Australia and in micrograms by New Zealand. The Germans will often express the same nutrient (eg, sodium) in both grams and milligrams, depending on the amount present. It is a simple matter to catch differences in printed food tables, but tedious to try and determine differences in datafiles. Again, this problem area is addressed in at least two INFOODS' books published by United Nations University (17, 18), and all INFOODS-recommended tagnames for food components are unit- specific.

5. Copyrights

Most of the world's food composition databases and printed food tables are copyrighted. New Zealand reproduces some of the British and Australian data with permission from the copyright holders. Royalty payments and exchanges are involved. Software developers and book publishers using the New Zealand source data enter into arrangements with the Department of Scientific and Industrial Research for reproduction of these data. International interchange arrangements must include restrictions on reproduction of information, and permission when this is desired.

6. Uniqueness

Many foods are unique to a country or at least to the food database of a country with no equivalent counterpart (eg, New Zealand lists two varieties of feijoa, a fruit). Additionally, conditions affecting nutrient composition can also be unique. New Zealand, for example, is known to have unusual geochemistry, affecting the elemental concentration of foods. New Zealand also has unique food legislation which affects composition by regulating the extraction rate for refined grains, prohibiting nutrient fortification and enrichment of most foods including milk and refined grain products, and setting a minimum fat content for milk products. This poses no problem when viewing or comparing compositional data from different countries, but it would pose problems if data were to be adopted for use in another country's national database.

SOLUTIONS TO THE PROBLEMS

The first step in solving the problems of international interchange of nutrient data is the adoption of international nutrient tagnames as defined by INFOODS (17). This eliminates the potential problems associated with inconsistencies in nutrient names, methods of analysis, and units.

The second most important step is the adoption of a standardized data format, which has also been defined by INFOODS (18). This would allow a programmed structure to be created and used by all involved in interchange. Data from around the world could simply be dropped in for easy and systematic storage, retrieval and manipulation.

Because most of the proposed solutions are untested to date, an interchange trial should be established. This should be undertaken by two countries from different regions, under the auspices of INFOODS and the United Nations University.

The successful trialing of the system (perhaps including the food descriptor system, LANGUAL) would lead to general adoption and dramatic easing of the problems now facing those who wish to participate in international interchange of food composition data.

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Australian publications and datafiles are available for purchase from the Australian Government Publishing Service Mail Order Sales, GPO Box 84, Canberra ACT 2601, Australia.

New Zealand publications and datafiles are available for purchase from FOODDATA, Department of Scientific and Industrial Research, Private Bag, Palmerston North, New Zealand.

Various South Pacific publications are available freely or for purchase from the South Pacific Commission, B.P. D5, Noumea Cedex, New Caledonia.