

## INTERNATIONAL ISSUES OF NUTRIENT DATA BANKS

Anders Moller

National Food Agency of Denmark  
Computer Section  
19, Morkhoj Bygade  
DK-2860 Soborg  
Denmark

### Introduction

Collaboration within the field of food composition data banks and food composition tables is a must, if a small country like Denmark even thinks of doing things like that. Collaboration means contact to foreign government agencies and other bodies dealing with the subject.

The collaborators of the National Food Agency of Denmark are according to their importance:

#### Most Important

NORFOODS  
MAFF, UK  
CIQUAL, France  
FDA, CFSAN  
USDA, HNIS

#### Important

EUROFOODS  
INFOODS  
other XXXFOODS'

The collaboration among the Nordic countries is without any competition the most important for us in Denmark. I will therefore start by explaining the background of this issue.

### The Nordic Countries

If you look at a map you will see, what you might already know, namely that Scandinavia is situated at the northern borders of the European continent. In daily speaking, Scandinavia consists of the following countries:

Denmark (and Greenland, Faroe Islands)  
Finland  
Iceland  
Norway  
Sweden

In fact, Scandinavia is only the peninsula where Norway and Sweden are situated, and therefore in the following paper I will talk about the Nordic countries, the official name for the above mentioned countries.

The Nordic countries are tied closely together. We are all descendants from the famous 'vikings', who burned off most of the rest of Europe a thousand years ago, and settled Iceland, Greenland and even got as far as North America at that time.

Denmark, Norway and Sweden have languages that are very similar to one another. Iceland and Faroe Islands have a language that is more difficult to understand; it is a language very similar to the language spoken by the vikings. Finnish is a very difficult language for me to understand. In fact, I hardly understand a word, when it is spoken. Finnish and Hungarian stem from the same root.

## A. MOLLER

Norway, Sweden and Finland are known for the mountains and pine forests. Finland also for its many lakes ('the land of the thousand lakes'). Denmark is a very low farmland (the highest point, Himmelbjerget, 'The Skymountain', is only about 500 feet above sea level). Whereas Iceland is almost completely without trees and is very volcanically active.

The very close relations between the Nordic countries have resulted in quite a lot of collaboration between the countries. Some of the collaboration is gathered under the supervision of the Nordic Council of Ministers. Of all the Nordic countries, only Denmark is a member of the European Economic Community (EEC). Hence, Denmark is tied by the agreements and decisions taken by the EEC, and not able to make independent decisions in the Nordic collaboration. The only field where Denmark stands free of the EEC is the nutrition area, therefore we have very close collaboration between the Nordic countries within this area.

The Nordic Council of Ministers has supported several working groups concerned with nutrition and dietary surveys. Just to mention some examples:

- |          |   |
|----------|---|
| NORKOST  | concerned with the methodology of dietary surveys                             |
| NORSOC   | concerned with dietary habits and sociological evaluations thereof            |
| NORFOODS | concerned with Nordic food composition tables and food composition data banks |

### **The Collaboration Among the Nordic Countries, NORFOODS<sup>1</sup>**

NORFOODS started its activities in the spring of 1982 with the financial support of the Nordic Council of Ministers. The collaboration was started at a meeting between data compilers from the Nordic countries at the National Food Administration in Uppsala, Sweden. Since only very few people, usually one in each country, are actually working with data compilation, there was an urgent need for collaboration within this field. The NORFOODS group comprises representatives from each of the Nordic countries.

At the first meetings, a common Nordic data bank for nutrients was discussed. It soon became apparent that it was not the common data bank that was needed, but rather a much closer contact between the people working with the data compilation.

NORFOODS has exchanged information and experiences, and operated in concrete project related to food composition tables and nutrient data banks. The NORFOODS group has had several meetings during its existence. In earlier years, two or three meetings each year, now usually one meeting each year. During these meetings, information has been exchanged on a number of issues and many common problems have been solved within the Nordic countries. This inventory and cooperation has been vital for the separate work on food composition tables and nutrient data bank systems in each country. It has facilitated cooperation in identifying the similarities and differences among the various Nordic countries with respect to data available on the composition of foods.

### **New Food Composition Tables and Data Banks in the Nordic Countries**

*Denmark.* The work on the official Danish Food Composition Data Bank was initiated in 1981 by an initiative

---

<sup>1</sup>Prepared by the members of NORFOODS. See attached list of members

## INTERNATIONAL ISSUES OF NUTRIENT DATA BANKS

from The National Food Agency of Denmark, where it now resides. The data bank now comprises data on more than 1,500 analyzed Danish foods. Until now, interest has been shown in 255 different food constituents, i.e. of course nutrients, but also toxic heavy metals, compounds causing adverse reactions in man, food additives etc. For each food data on compounds are stored with information on average content, median (standard deviation), range, number of samples and a reference code with direct reference to the source of data, i.e. laboratory, project, report, literature source etc. The nutrient part of the Danish Food composition Data Bank is available on diskette with a nutrient calculation software (DanKost ver. 1.3).

At the moment the Danish Nutrient Data Bank includes, in addition to the above mentioned Danish foods, data from Finland, Iceland, Norway, Sweden, United Kingdom, The Netherlands, France, USA and Nepal. A total of approximately 10,000 food entries.

Food composition tables in Denmark has a long tradition, The first food composition table was published more than a hundred years ago, but it was not until 1983 the first official Danish food composition table was published by the National Food Agency of Denmark. The newest edition of the Danish Food Composition Table 'Levnedsmiddeltabeller (nutrient Composition of Danish Foods)' was issued in April 1989 (Moller 1989). It contains data on 770 Danish food and 52 nutrients and other food components. Food names and index are given in Danish as well as English. A separate table on amino acid, carbohydrate and fatty acid composition will be published in 1990.

**Finland.** Like Denmark, Finland has a long tradition on food composition tables, but no official table has been published until now. The Finnish food composition tables 'Nutrient Composition of Foods' published by the Finnish Social Insurance Institution was issued in March 1989 (Rastas et al. 1989). They are considered being the basis for a coming national food composition data bank in Finland.

The table contains data for about 400 different foods with exact information of data sources, using a similar coding system as used in the Danish Food Composition Data Bank and food composition table. For each nutrient value, a reference number is given (the number of the data source and the exact code number, page number, number of the table etc.) according to which the value can be exactly identified. Each food contains information on up to 64 nutrients. More than half of the values in the table are based on recent published or unpublished analytical Finnish values. The rest have been compiled from foreign tables or other publications (mainly Swedish, Danish or Norwegian food composition tables, but some values have been derived from British, German and the USDA tables.) When certain values for a food have not been available, values for related foods or calculated (imputed) values have been used. Food and nutrient names introduction and index are in Finnish, Swedish and English. These food composition data are a part of a nutrient calculation system NUTRICA and the data bank has also been available on tapes to the users.

In Finland, the work towards a national nutrient data bank system is continuing. Two working groups set up by the Ministry of Health and Social Affairs in 1985 and in 1987 have delivered their reports with propositions on the maintenance of the nutrient data bank. The location of the Finnish nutrient data bank is planned to be the Epidemiological Section of the National Public Health Institute in Finland. The *data bank up dating group* consists of a nutritionist, a computer expert and an official employee.

**Iceland.** The first comprehensive, official Icelandic food composition tables were published in July 1988 (Reykdal 1988). The tables are the result of a project carried out collaboratively by six Icelandic institutes in collaboration over the past ten years. Most of the work was carried out by Rannsóknastofnun Landbunadarins (the Agricultural Research Institute in Reykjavik).

The tables are divided into three parts: Main tables (proximates, vitamins, mineral elements), tables on fatty

## A. MOLLER

acids, and tables on carbohydrates. In addition, they also contain data on amino acids, toxic heavy metals (arsenic, lead, cadmium and mercury), and benzpyrene, DDT, histamine, linuron, nitrate and nitrite and volatile nitrosamines. The main tables contain information on 42 components. For each compound the average value, the range, number of samples and reference number are marked in the tables. A list of references together with English-Icelandic and Icelandic-English indices is included. A data bank for food composition has also been established, and the food composition tables are direct printouts from this data bank.

**Norway.** The Norwegian food composition tables 'Matvaretabeller' are published by the Nutrition Council of Norway. The latest edition (5th edition) was issued in 1984. It comprises 760 foods with 14 components. In 1987 a special sodium supplement and in 1988 a fatty acid supplement were issued.

**Sweden.** The Swedish food composition tables 'Livsmedelstabeller' are published by the Swedish National Food Administration. The latest edition of the Swedish main tables was issued in 1986. The next edition of the main tables is planned for publication in 1992. In 1987 the school edition of the Swedish tables and in 1989 the fatty acid supplement were published. The Swedish Nutrient Data Bank (National Food Administration) is available on diskettes. It now contains data on 850 foods and 600 dishes.

### NORFOODS' Projects

NORFOODS has worked on many projects during its existence. Those projects that have been completed or are almost finished are mentioned here.

***The Directory of Data Banks in the Nordic Countries.*** The directory of nutrient data banks in the Nordic countries in all Nordic languages as well as in English has already been published (NORFOODS 1988). In the directory, each country's nutrient calculation systems are described in the following order: Denmark, Finland, Iceland, Norway and Sweden in their national languages as well as in English. The systems are arranged according to the owners' status: government agencies, country-wide association, universities, country and local authorities, food industries, publishers and other companies.

In the inventory of the Nordic nutrient calculation systems, NORFOODS found 18 systems in Denmark, 7 in Finland, 1 in Iceland, 4 in Norway and 31 in Sweden, but after the inventory some new systems have come into the market. Most Danish and Norwegian systems are mainly planned for microcomputers, as well as, the only Icelandic system. Most Finnish systems are designed for mainframes and the Swedish systems either for mainframes or microcomputers. In addition to nutrients, some systems also contain data on food additives and prices.

***The Dictionary of Food Names and Terms.*** Currently under preparation is a dictionary of food names and terms including English, Danish, Finnish, Icelandic, Norwegian, and Swedish and, where appropriate, scientific names.

We hope that the dictionary will facilitate the work of those persons responsible for the compilation of food composition tables and nutrient data banks in each of the Nordic countries. The dictionary will be divided into five parts:

- \* NORFOODS' 13 main food groups in the five Nordic national languages as well as in English.
- \* Charts from the five Nordic countries showing the animal and meat cut names in the Nordic national languages with approximate English translation.
- \* Table (no.1) lists food names in alphabetical order by the Nordic languages and by NORFOODS' food

## INTERNATIONAL ISSUES OF NUTRIENT DATA BANKS

groups. Terms are listed according to color, etc. English translations are included in each table.

- \* Table (no.2) composed of two survey tables with food names and terms in English and the five Nordic national languages. Scientific names are also included. The tables are in alphabetical order according to the English translation. The name of a food or a term in the different languages can be compared at the same opening.
- \* Table (no.3) consisting of two tables which are in alphabetical order. Food names and terms in the different Nordic languages are included together with their English translation.

In addition to this first part of the dictionary, a dictionary containing data (names) on dishes and prepared foods common in the Nordic countries is planned to be published.

*The NORFOODS Computer Group.* In the autumn of 1985, NORFOODS formed a special working group, whose main task was to evaluate methods of easy interchange of nutrient composition data using telecommunication systems or computer-readable medias (Moller et al. 1987, English translation 1989).

The technical problems occurring during these trials have been evaluated together with the different algorithms used in nutrient calculation in the different national nutrient calculation systems. This work has been finished with a proposal of minimum standards for the data interchange between the Nordic countries in order to make it possible for all the Nordic countries to use other countries nutrient and other data in an easy way. The first systematic interchange of food composition data among the Nordic countries took place in the autumn of 1986. The project has shown that with a minimum of restrictions, it is possible to carry out data interchange, which makes it possible for the receiver to recognize and manage the data. Data interchange in machine-readable form can imply certain problems concerning copyright, especially as it is only the Swedish and the Danish food composition tables which are entirely official and completely paid for by public funds in the two countries.

Furthermore, the project has shown it to be advantageous to the Nordic co-operation because only very few people are working within the fields of food composition data banks in the individual Nordic countries. This has also shown implications for better co-operation in the fields of data according to the data models (data base construction) in the food composition data banks, interchange of software algorithms, interchange and standardization of video screens (user interface), and special routines for the import/export of data to/from nutrient calculation software.

Because of the success of the first composition data interchange among the Nordic countries, in November 1989, it was decided that a second data interchange should take place before the summer of 1990.

*NORFOODS' Food Grouping.* Due to problems in comparing nutrient intake from the different food groups, a proposal of 13 main groups and a subgrouping system has been circulated for comments in the Nordic countries.

### NORFOODS Main Food Groups

- |                                      |                                       |
|--------------------------------------|---------------------------------------|
| 1. Cereals and cereal products       | 8. Eggs and egg products              |
| 2. Vegetables and vegetable products | 9. Sugar and sugar products           |
| 3. Fruits and fruit products         | 10. Beverages                         |
| 4. Fat, oils, and products thereof   | 11. Condiments/special ingredients    |
| 5. Dairy products                    | 12. Foods for special nutritional use |
| 6. Meat and meat products            | 13. Miscellaneous                     |
| 7. Fish and fish products            |                                       |

## A. MOLLER

The common grouping system is also intended to be of help in the use of food composition tables of other countries.

### Conclusions

The very close Nordic co-operation has been useful to the individual countries, especially for the compilers and maintainers of the food composition data systems and food composition tables. At present, all Nordic countries have comprehensive and high quality food composition tables. The users of these tables also know where they can get help concerning food composition data if needed.

The members of NORFOODS responsible for this summary of NORFOODS activities:

Maarit Ahola	Fresh Finland Center PO Box 908 SF-00101 Helsinki, Finland
Lena Bergstrom	National Food Administration PO Box 622 S-751 26 Uppsala, Sweden
Anders Moller	National Food Agency of Denmark Morkhoj Bygade 19 DK-2860 Soborg, Denmark
Olafur Reydal	Agricultural Research Institute Keldnaholt IS-112 Reykjavik, Iceland
Arnchild Haga Rimestad	Section for Dietary Research Institute for Nutrition University of Oslo P.B. 1117, Blindern N-Oslo 3, Norway

### References

1. Ahola M., Teidot elintarvikelsta tietopankkiin. Kotitalous 9: 8-10, 40, 1987a.
2. Ahola M., Nutrient Data Bank Systems in Finland. Var foda suppl. 1: 93-94, 1987b.
3. Bergstrom L., Moller A., Ahola M., Reykdal O., and Rimestad A.H., Naringsdata in Norden. Datoriserad behandling. Abstract no. PO 8.4. Nordiske ernæringskongres. 14-17. August 1988 i Odense.
4. Landsforeningen for Kosthold og Helse. Vedlegg 1 til Staten Ernæringsrads matvaretabell: Natriuminnhold i matvarer og retter (Sodium content of foods and dishes), 1987.
5. Landsforeningen for Kosthold og Helse. Vedlegg 2 til Staten Ernæringsrads matvaretabell: Natriuminnhold i matvarer (Fatty acid content of foods), 1988.

## INTERNATIONAL ISSUES OF NUTRIENT DATA BANKS

6. NORFOODS. Nutrient calculation systems in the Nordic countries. NORFOODS report 1, 1988.
7. Moller A., Louekari K., Ydersbond T, Isaksson H. Rapport vedrorende elektronisk udveksling af levnedsmiddeldata mellem de nordiske lande. September 1987.
8. Moller A., Louekari K., Ydersbond T, Isaksson H. Food Composition Data Interchange among the Nordic Countries. October 1989.
9. Moller A. (ed.) *Levnedsmiddeltabeller 1989. Nutrient Composition of Danish Foods.* Storkokkencentret, Levnedsmiddelstyrelsen. Soborg, 1989. 862 pp.
10. Rastas M., Seppanen R., Knuts L-R., Varo P. (eds.). *Ruoka-aineiden ravintolainesisano. Nutrient composition of foods.* Publications of the Social Insurance Institution. Karisto, Hameenlinna, 1989. 452 pp.
11. Reykdal O. (ed.) *Islenskar naeringaefnatoflur (Icelandic food composition tables).* Volumes I (256 pp) and II (121 pp) 1988.
12. Rimestad AH., Ahola M., Bergstrom L., Moller A., Reykdal O., *Naeringsmiddeltabeller - bruk og utarbeidelse.* *Naringsforskning* 32: 26-32, 1988.
13. Statens Livsmedelsverk. *Livsmedelstabeller (Food composition tables).* Uppsala 1986.
14. Statens Livsmedelsverk. *Livsmedelstabeller, skoluppiaga (Food composition tables, school edition).* Uppsala 1987.
15. Statens Livsmedelsverk. *Fettsyratabeller (Fatty acid tables).* Uppsala 1989.