

Auditing the Australian Food Composition Program

Summary report and response to recommendations

Food Standards Australia New Zealand

Background

FSANZ is home to Australia's food composition program. Run by a small team of nutritionists, the main function of the food composition program is to generate, compile and publish high quality Australian data on the nutrient composition of foods

FSANZ uses the data to produce reference and survey databases such as NUTTAB and AUSNUT, and to feed into FSANZ risk assessment processes. These data are also used externally for nutrition labelling, research on diet and disease, education, and to assist consumers make healthy food choices.

In February 2009, FSANZ commissioned a review of its food composition program. The review formed part of the FSANZ Science Strategy for 2006-2009, which aims to enhance FSANZ's scientific capability. The review of the food composition program was the third such review commissioned by FSANZ under the Science Strategy.

The review was undertaken over a one week visit by Dr Isabel Castanheira of the Portuguese National Institute of Health. Dr Castanheira was well placed to undertake this review, particularly given her extensive involvement with the European Food Information Resource (EuroFIR), a Network of Excellence in food composition databases¹. Her contributions to EuroFIR have included research related activities, as well as lecturing in the course *Production and Use of Food Composition Data in Nutrition*.

Purpose of the review

The purpose of the review was to assess all aspects of the food composition program, taking into consideration international best practice, and to identify areas for improvement.

The terms of reference were to:

- review the approach FSANZ uses to generate, accept, reject and compile nutrient data, including sampling frames and laboratory requirements
- review the format, content and presentation of FSANZ food composition publications (in particular NUTTAB 2006 and AUSNUT 2007) and associated documentation such as explanatory notes and website material
- identify food composition related issues, including developments in methodology, which FSANZ may need to consider in the near to medium term
- assess the staffing profile of the food composition program team and the training provided to team members and
- provide a written report to FSANZ on review findings, including recommendations for possible improvements.

¹ European Food Information Resource - a partnership of 40 members from 21 countries who aim to strengthen scientific and technological excellence in food composition databases and improve the compatibility of food composition databases across Europe.

Materials and methods

The methodology involved examining current FSANZ food composition databases and supporting documentation, training manuals, laboratory analysis procurement documents and associated information, as well as meeting with a number of staff and others involved in food composition.

Databases and documents reviewed

- AUSNUT 2007 and NUTTAB 2006 core database files, explanatory notes and supporting documentation such as matching files, brand files and reference lists, and web text
- food composition training manuals and data quality manuals, which detail key activities, work plans, data collection, checking and upload techniques and data quality issues
- food analysis procurement documents including Request for Tender templates, sample purchase and preparation manuals and Contract for Services templates
- the food composition data management system, the Australian Nutrient Databank (ANDB)
- the dietary modelling system, DIAMOND and
- other relevant documents.

Meetings and interviews

Meetings and interviews were held with staff involved at all levels of the food composition process. To gain a general overview of the FSANZ Science Strategy, meetings were held with the Chief Scientist, Risk Assessment General Manager and the food composition Section Manager. Meetings were also held with individual members of the food composition team and the FSANZ nutrition discipline group. Other relevant FSANZ scientific staff and the Food Composition Advisory Group (an external group made up of experts in the field of food composition) were also consulted.

Using the information gained from these discussions, Dr Castanheira assessed the FSANZ food composition program against international best practice, with a particular emphasis on the work being undertaken by EuroFIR.

A SWOT (Strengths-Weaknesses-Opportunities-Threats) analysis was used in this review as it was considered to be an appropriate management tool for evaluating strategic plans of scientific organisations, and would enable the formulation of an approach that would fit into the overall FSANZ science strategy plan. The SWOT analysis method facilitates the evaluation of favourable and unfavourable internal factors (Strengths and Weakness respectively) and favourable and unfavourable external factors (Opportunities and Threats respectively).

In this study, SWOT analysis was used in a qualitative analysis of the relevant internal and external factors, and helped to identify appropriate strategies for the development of new or improved capabilities. SWOT analysis also enabled a comparison of opportunities with strengths and weaknesses with threats.

Findings and recommendations

Overall, the outcomes of the review of FSANZ's food composition program were positive. However, the SWOT analysis identified a number of areas that could be improved, and Dr Castanheira made some recommendations to FSANZ regarding these.

The main findings and recommendations (which have been slightly revised from the full report for readability), together with FSANZ's response to these recommendations (where relevant) are set out under the SWOT headings of Strengths, Weaknesses, Opportunities and Threats.

FSANZ is now in the process of developing a comprehensive project plan to prioritise the implementation of these recommendations, based on the strategies proposed by FSANZ below.

Strengths

The analysis of strengths is based on internal factors, encompassing the overall process including data production, management and use, and using the results of audits described in the materials and methods section.

- a) The food composition program is regarded as an authoritative source in Australia, New Zealand and Pacific Region for food composition tables.
- b) FSANZ's food composition databases contain more than 80% analytical data from foods consumed in Australia.
- c) The selection of laboratories is made according to international guidelines, which means that laboratories are NATA accredited or have demonstrated their competence by succeeding in proficiency test programs or by other accepted means.
- d) The selection of foods and nutrients for analysis is in accordance with international prioritised lists. This facilitates the use of Australian food composition tables in multi-centre epidemiological studies and international studies.
- e) The selection of foods and nutrients for analysis and the design of sampling plans is made in consultation with relevant experts (such as dietitians and epidemiologists), and is thus based on sound science.
- f) The list of nutrients covers all European and American prioritised nutrients.
- g) Similar methodologies are used to compile data for nutrients, additives and contaminants.
- h) Food composition personnel are well trained and rigorously apply the rules of data quality control.

Weaknesses

Within the international arena, weaknesses are considered to be those factors that are crucial to guarantee the credibility of international food composition databases. The report identified several weaknesses, of which the most time consuming is a lack of a data quality assessment system.

- a) There is a lack of data quality assessment systems to evaluate data arriving from contract laboratories, from scientific literature, from industry, or from other food composition tables.

FSANZ has a number of formal systems in place for evaluating the food composition data it collects from the various accepted sources, ensuring (as far as possible) that it is accurate and reliable.

For example, FSANZ has developed general data quality guidelines, together with instructions for compiling food records for publication etc, for use by food composition personnel.

However, FSANZ recognises that there are some areas where more formal processes and procedures could be developed. As an example, while FSANZ develops various food composition guidance documents, there is no formal process in place for their ongoing maintenance.

As another example, while FSANZ has a general data quality guideline, a document dealing specifically with the quality assessment of nutrient data from scientific literature or food industry could also be developed.

FSANZ will work to systematically identify gaps in our food composition documentation. From there we will formalise our procedures in these areas and establish a regular cycle of document maintenance/ review. This is likely to be an on-going process.

- b) There is a lack of compliance with international rules of modes of expressions for beverages and some nutrients.

At the time of the review, all FSANZ food composition databases reported nutrient data per 100 g edible portion. To address this issue, FSANZ developed a function within ANDB to report nutrients based on per 100 mL edible portion for liquid foods. As a result NUTTAB 2010 and all future publications will report foods per 100 g and 100 mL where appropriate.

- c) There is a lack of collaborative studies on recipe calculation and nutrient losses and gains (NLG).

As part of their food composition training, data compilers participate in training in recipe calculations.

In preparation for the 2011-2013 Australian Health Survey, a comprehensive review of the current scientific literature for data on NLG has been undertaken.

As a member of EuroFIR as at April 2011, FSANZ will be in a better position to take up a range of opportunities to participate in relevant collaborative studies with external agencies.

- d) Some personnel are contracted on a temporary basis. An enormous amount of work is required to train these staff in the scrutiny and entry of food composition data produced by laboratories under contract to FSANZ for the specific purpose of compiling food composition tables. A sound scientific background, and specific training of personnel involved in the selection of data is required.

The current practice of recruiting staff into the food composition team for the duration of specific projects may need to be reviewed against current ongoing staffing levels, noting that valuable knowledge and skills can be lost when a project comes to completion.

Food composition team members have university qualifications in science. However, as food composition is such a specialised area, each member of the team must also undergo further, specific training. Detailed training procedures for new members exist. Training materials cover general food composition principles as well as database and project specific training. However it is recognised that further training documents could be developed as part of recommendation a).

New team members are also expected to complete the FAO/WHO INFOODS Food Composition Study Guide. As resources permit, selected staff are given the opportunity to participate in relevant international training programs.

- e) There is a lack of laboratory facilities to analyse vitamin D for the most important forms vitamin D₂ (ergocalciferol), vitamin D₃ (cholecalciferol) and 25-hydroxy-vitamin D (25-OH-D).

FSANZ is not directly responsible for the implementation of a suitable strategy to address this issue. However, FSANZ acknowledges that there is a need for accurate vitamin D data and notes that suitable methods for determining the vitamin D content of unfortified foods are still being developed both in Australia and internationally.

Within Australia, method development work in this area by a number of analytical laboratories is continuing, with the conduct of an informal inter-laboratory trial, focussing on the vitamin D content of meat.

FSANZ will continue to interact with analytical laboratories regarding vitamin D analysis. FSANZ will also continue to gather data on the vitamin D content of food as the methodology is refined.

Opportunities

In the SWOT analysis opportunities are considered external conditions that are helpful to achieving objectives. In the review the external environment was defined to include international organisations that are in some way involved with food composition databases, at the regional, national and international level.

- a) FSANZ should invest in/prioritise analytical data for foods to be exported from Australia. This would reduce the need for reanalysis of Australian exported foods by

overseas data compilers. This would also promote USDA use of Australian data for prioritised nutrients e.g. bioactive compounds and trans fatty acids. Finally, this could promote valuable linkages between FSANZ and Australian government agencies and private companies involved in the export of foods.

FSANZ has limited funds available to commission nutrient analysis. Therefore, nutrient analysis generally focuses on generating data for new foods supplied in Australia or updating data for foods that are likely to have the biggest impact on nutrient intakes, for use in FSANZ risk assessments and national nutrition surveys. As such, funds are not specifically directed towards foods destined for export from Australia.

However, there has been occasion for FSANZ to contribute small sums of money to larger research projects. As a recent example, FSANZ supported a seafood research project managed by the South Australian Research and Development Institute, which had a focus on export commodities that were also supplied domestically. Nutrient data generated from this project will be incorporated into ANDB for use in future food composition publications.

While FSANZ itself has limited funds available for nutrient analysis, we are often requested to provide advice to companies or organisations developing analytical programs for their products and, in the interests of promoting best practice in the area of food composition, are keen to maintain this role.

FSANZ will continue to explore opportunities to extend our data holdings for exported foods.

- b) FSANZ should create a database of bioactive compounds in foods (namely fruits, vegetables and meat) available in Australia and other Pacific region countries. A database on bioactive compounds from foods obtained from animal sources does not currently exist, and some government organisations see the need for this data gap to be addressed.

FSANZ has limited funds for food composition activities, and it is unlikely that funds will become available in the near future specifically to develop a database on bioactive compounds.

FSANZ will however endeavour to collate data on bioactive compounds found in published literature, and obtain the necessary permissions required to reproduce the data.

FSANZ may also consider contributing small sums of money to research groups to extend the data available in this area, however this would depend on the future availability of funds for this purpose.

- c) FSANZ should strengthen liaisons with European organisations (via EuroFIR) to disseminate Australian food composition data among European countries.

To address this recommendation, FSANZ became a member of EuroFIR in April 2011. Through EuroFIR, FSANZ will be able to establish contacts in European countries and to identify opportunities for disseminating Australian food composition data internationally.

Threats

A classical analysis of threats (which examined potential competitors in the market place) was carried out. Results indicated that a real threat to core business would be difficult or unlikely to occur, particularly as FSANZ is a national government organisation and has custody of the national food composition databases.

Threats in the sense of specific hazards or critical actions were also analysed, focussing on our procurement processes (involving external service providers) and our position as a government agency.

- a) Tenders for provision of services of analytical services or tailor-made software should be prepared carefully, taking into account lessons learned. For example, in the past analytical laboratories might have produced data that did not entirely fit the purpose, and on occasion there were problems with contracts for tailor-made software.

FSANZ conducts procurement under strict guidelines and places considerable effort into the successful management of contracted services.

To address this recommendation, FSANZ revised our food analysis procurement documents including the Request for Tender, Contract for Services, food and analyte lists, sample purchase and preparation manuals and reporting requirements. The aim of these revisions was to ensure FSANZ expectations are clear and to minimise the work required by FSANZ to prepare the data for upload into ANDB and subsequent use in food composition publications.

FSANZ has established a panel of preferred analytical laboratories, which will streamline the process of commissioning analytical services. These laboratories have proven their capacity to fulfil FSANZ requirements for the provision of accurate, reliable food composition data, using accredited methods.

FSANZ is developing a new data management system called Harvest. Harvest will combine ANDB with the dietary modelling system DIAMOND to create a highly developed system which will provide:

- *increased usability for FSANZ staff and improved efficiency in data processing, analysis and reporting*
- *greater reliability and performance*
- *increased integration with data systems from external providers (namely analytical laboratories), facilitating data upload*
- *reduced use of and reliance upon external contractors and*
- *a flexible (modular) and extensible platform which can be upgraded as necessary without requiring the whole system to be rebuilt.*

Harvest has a planned ten year operational lifespan.

- b) FSANZ being a government organisation, there are risks associated with unknown future political and administrative arrangements, which could potentially have an impact on the levels of funding available for food composition activities.

FSANZ acknowledges the importance of maintaining a food composition function, particularly with respect to its role in generating nutrient data that feed into FSANZ risk assessment processes. Good planning will be required to ensure that food composition activities make the best use of available funding and staffing resources, whatever the political and administrative arrangements.

Conclusions

On the basis of the SWOT analysis supported by available international guidelines for food composition tables (EuroFIR), FSANZ is considered an excellent organisation.

Developing in-country analytical facilities for the most important forms of vitamin D2 (ergocalciferol), vitamin D3 (cholecalciferol) and 25-hydroxy-vitamin D (25-OH-D) is one of the most important issues in the field of Australian food composition that needs to be addressed.

The maintenance of data upgrade programs is necessary and crucial.

Documentation is considered a key issue and FSANZ has systems in place which make it possible to trace the data from compilation for publication back to raw data, especially for newer data.

Seeking out other areas of scientific development is recommended, and strength linkages with organisations in the areas of nutrition/ food safety/ food labelling and trade are advisable.

A review of the Australian food composition program has been a relevant and timely process. This is one of the first to be audited internationally and the model and results could be used as an example of good scientific practice according to the concepts defined by Greenfield and Southgate (2003).

The full report can be accessed from the FSANZ website:
<http://www.foodstandards.gov.au/consumerinformation/foodcompositionprogram/>