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Progress with a global branded food composition database

The Food Monitoring Group *,[1]

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ABSTRACT

Excess energy, saturated fat, sugar and salt from processed and fast foods are a major cause of chronic disease worldwide. In 2010 The Food Monitoring Group established a global branded food composition database to track the nutritional content of foods and make comparisons between countries, food companies and over time.

A protocol for the project was agreed and published in 2011 with 24 collaborating countries. Standardised tools and a website have been developed to facilitate data collection and entry. In 2010 data were obtained from nine countries, in 2011 from 12 and in 2012 data are anticipated from 10 additional countries.

This collaborative approach to the collation of food composition data offers potential for cross-border collaboration and support in developed and developing countries. The project should contribute significantly to tracking progress of the food industry and governments towards commitments made at the recent UN high level meeting on chronic disease.

1. Introduction

The importance of chronic diseases, as the leading cause of premature death and disability in the world (World Health Organisation, 2004) was highlighted at the recent United Nations High Level Meeting on Chronic Disease (Beaglehole et al., 2011). Governments and the food industry are under increasing pressure to improve the quality of the food supply to ameliorate the enormous burden of disease caused by poor diet. While the food industry has achieved great success in providing a constant supply of affordable food to much of the world (Yach, Feldman, Bradley, & Khan, 2010), improvements in nutritional composition are urgently required to reduce the very high levels of saturated fat, sugar and salt to which many are now exposed (Faergeman, 2006; Monteiro, 2009; World Health Organisation, 2002).

The Food Monitoring Group was established in 2010 with the goal of objectively comparing and tracking the nutritional composition of processed foods in diverse countries around the world. A protocol describing the project has been agreed and published by the group with the primary objective being to standardise methodology such that robust comparisons can be made between countries and over time (Dunford, Eyles, Ni Mhurchu, Webster, & Neal, 2011). The rationale behind the initiative is that ongoing independent, systematic monitoring and reporting of product formulation worldwide will unequivocally document any changes that are occurring within the global food supply. Furthermore, it is hoped that by bringing transparency and objectivity to the monitoring process, and having data that describes the progress of individual countries and companies it will be possible to drive improvements in food composition. Specifically, the information that derives from the project will provide governments, industry nutritionists, health professionals and advocacy groups with new evidence about areas where progress is being made and areas where it is not. Using this information it should be possible to more effectively direct resources and better identify the most appropriate strategies for making improvements. This report provides an update on progress with the project.

2. Design

The methodology for this collaborative project has been described previously (Dunford et al., 2011a, 2011b). In brief, ongoing surveys of processed foods and fast foods in participating countries are undertaken to document the composition of the main foods available for purchase. The same basic methodology is applied in each country to enable comparisons of product composition at baseline, over time, and between countries. Depending upon the needs of each participating country, results are provided back to governments, manufacturers, food retailers, advocacy groups and other stakeholders. Flexibility with study implementation has been retained to enable participating countries to develop pragmatic and easily repeatable sampling systems that suit their particular circumstances and level of resource. In reporting project findings,

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particular attention will be paid to the sampling methods in each country, the completeness of coverage achieved and the potential for bias during data collection.

3. Project status

3.1. Country recruitment

The intent of the project is to include a broad geographic coverage of countries. To date, 24 countries are involved in the collaboration. Of these, nine have provided some data for 2010, 12 for 2011, and 10 plan to commence or repeat data collection in 2012 (Table 1). Data for Fiji, India, China and Australia have been included in the central database and data for a further three countries are in the process of being entered.

3.2. Materials development

A series of instruction documents and electronic resources have been developed to assist participating countries with data collection and data entry. These are based primarily upon outputs derived from work undertaken by The George Institute in support of the World Health Organisation's efforts to monitor the sodium content of foods (Dunford & Webster, 2010). Materials are updated regularly and are adapted to suit each country's requirements. For example, in a few countries the collection of information was restricted to the sodium content of foods because this is the current focus of government interest and materials were therefore adapted accordingly. In addition, electronic materials such as smartphone applications, have been developed to assist participating countries in data collection.

3.3. Database and data collection methods

An online data entry system has been established to enable the collation of information by one of two different methods. Depending upon the preference of each participating country, countries can either upload the entire dataset in the form of an Excel spreadsheet or can enter data online as individual items. In practice, most countries upload the dataset using an Excel spreadsheet in the first year of data collection and use the online system in each subsequent year.

More recently, in Australia, data have been collected using smartphones and barcode scanning technology which has further simplified the process and is a model planned for roll out in other countries in future years.

3.4. Data collected

The variables sought for each food product and their definitions are indicated in the supplementary material. Missing data are noted as such with products for which only company name and product name are available recorded to highlight the absence of data. In some participating countries labelling that displays the nutrient content of foods is not mandatory (Table 1) and documenting the absence of data will be a useful exercise in itself. In countries where labelling is required, information is mostly collected directly from the nutritional label on the product although this may be supplemented by information obtained from websites or the manufacturer. Where these data are not available, direct chemical analysis of products is necessary although this is unlikely to be a plausible means of collecting data for all products in any country because of the costs involved. Analytic data collected for a subset of products in a number of countries will provide for a useful validation of the corresponding data provided on the product labels.

Depending upon the resources available, collaborating countries have determined the breadth of the data to be collected and the method utilised. Strategies include both the collection of comprehensive nutrient information for all product categories or the collation of data for selected product categories or nutrients only (Table 1).

3.5. Policy for data sharing and publication

Key to the success of collaborative projects of this nature is a clear understanding between partners about the way the data will be accessed and used. It has been agreed that each contributing country will have access to summary data from all countries and full access to their own data. Collaborators will be free to analyse and publish using their own data but analyses and outputs involving data from two or more countries will require agreement from each country involved. For publications involving many countries in the collaboration, the secretariat will take responsibility for ensuring agreement is obtained from all members. The principle underlying the distribution of information will be that it be shared freely amongst groups with public health goals with restrictions on sharing limited primarily to ensure quality of analysis and outputs. This will include industry groups who may be provided with reports through relationships established by the Food Monitoring Group members as part of efforts to improve the quality of the food supply.

3.6. Project outputs

The project has already delivered a number of outputs during its start-up phase, and there are a large number of initiatives currently underway (Table 2). Most importantly, protocols for the collection of standardised data on processed foods (Dunford et al., 2011a, 2011b) and fast foods have been agreed and published. Data from Australia and New Zealand have been used to compare temporal changes in the sodium content of breads over a four year period (Dunford et al., 2011a, 2011b) since this has been a focus of salt reduction efforts in both countries. Likewise, a broad-based cross-sectional analysis compared the sodium levels in major processed food categories between the UK and Australia in 2010 (Ni Mhurchu et al., 2011). Results from an analysis of the Brazilian food composition database have shown that some modifications in the formulations of the products are necessary, such as the reduction in SFA and sodium content (Menezes et al., 2011). In New Zealand, research on the nutrient composition and availability of healthier options at fast food outlets was undertaken (Chand, Eyles, & Ni Mhurchu, 2011), and also research identifying key opportunities for sodium reduction in processed foods (Woodward, Eyles, & Ni Mhurchu, 2012).The Australian dataset also includes information about fast food products provided by ten leading fast food chains and has been used to examine differences in the nutrient content of fast foods between companies (Dunford, Webster, Barzi, & Neal, 2010). A corresponding international comparison of fast foods has reported the comparative levels of salt in fast food products in six countries (UK, USA, NZ, Australia, France and Canada) from six of the leading global fast food chains (Burger King, McDonald's, Pizza Hut, KFC, Domino's and Subway) (Dunford & The Food Monitoring Group, 2012a; Dunford et al., 2012b). These reports have served to highlight marked differences between countries and between companies and the varied extent to which salt reduction goals have actually been achieved.

In addition to academic publications the Australian and UK contributors have used the data to prepare reports for the food industry to highlight areas for reformulation, to specify salt reduction

Table 1
Data collected in each country.

Country	Years data collected	Processed foods			Fast foods		
		No. products in latest year	Categories	Additional information	No. products in latest year	Outlets	Plans for next data collection
Argentina	2011	442	Select categories				2012 (selected categories)
Australia	2008–2011	20,000+	All products			From 6 chain outlets	2012 (all products)
Brazil[b]	2011	1720	Select categories				
Canada	2010, 2011	11,000	All products		3647	From 68 chain outlets	2013 (all products)
China	2010	3951	5 Categories	2615 Products with no NIP			2012 (all products)
Costa Rica							2013 (selected categories)
Ecuador							2012 (select categories; sodium data)
Fiji[a]	2011	1445	All processed foods	98 Products with no NIP			
France	2010				307	From 6 chain outlets	2012 (fast food only)
Guam[a]	2011	2151	All processed foods	43 Products with no NIP			
India	2010	4172	All products	930 Products with no NIP			2012 (all products)
Mongolia	2011	1000	Selected categories				
Nauru[a]	2011	235	All products	None with no NIP			
New Caledonia[a]	In progress	591	Selected categories	64 With no NIP			
New Zealand	2010, 2011	6021	All products	Tea/coffee, baby foods not included	609	From 12 chain outlets	2012 (all products)
Samoa[a]	2011	802	All products	50 WITH no NIP			
Solomon Islands	2011	103	5 selected categories	18 products with no NIP			
South Africa							2012 (selected categories)
Spain							
Tonga	2011	47	8 selected categories	13 Products with no NIP			
UK	2010, 2011	1406	Select categories			From 6 chain outlets	2012 (all products)
USA	2010, 2011				878	From 6 chain outlets	2012 (fast food only)

[a] Data for Guam, New Caledonia, Nauru and Fiji will be merged to form a Pacific Islands dataset.
[b] Products from Choices program, Brazil.

Table 2
Project outputs to date.

Use of data	Countries involved	Details	Status
Baseline levels of nutrients in foods			
Nutrients in fast food	Australia	Breakfast items highest in sugar (7.8 g/100 g) and saturated fat (5.5 g/100 g), chicken highest total fat (13.2 g/100 g) and sodium (586 mg/100 g). Variation in nutrient levels between similar products	Published (Dunford et al., 2010)
Sodium in processed foods	Australia	Sodium data were collected for 7221 products, foods highest in sodium were sauces and spreads (1283 mg/100 g) and processed meats (846 mg/100 g)	Published (Webster, Dunford, & Neal, 2010)
Sodium in processed foods	UK	Data available for 44,372 food products	Published (Ni Mhurchu et al., 2011)
Nutrient content of foods	Argentina	Results currently being finalised, 442 products collected	In process
Nutrient content of foods	China	Results currently being finalised; 3951 products collected	In process
Nutrient content of foods	Costa Rica	Currently underway	In process
Nutrient content of foods	India	Results currently being finalised; 4172 products collected	In process
Sodium and saturated fat in processed foods	New Zealand	Findings upon publication	One paper in press, one submitted
Nutrients in fast foods	New Zealand	Healthier options were lower in energy, total fat, saturated fat, sugar, and sodium than their regular counterparts.	Published (Chand et al., 2011)
Nutrient content of foods	Brazil	Results finalised; 1,720 products collected	Under review
Cross-country comparisons			
Sodium levels in fast food	Australia, UK, USA, France, NZ, Canada		Published (Dunford et al., 2012a, 2012b)
Sodium levels in processed foods	Australia:UK	Sodium lower in most types of food in UK compared to Australia.	Published (Ni Mhurchu et al., 2011)
Sodium content of pizza	Australia, Canada, Costa Rica, Finland, Japan, Malaysia, New Zealand, South Africa, UK, USA	Results showed that not one pizza product surveyed had the same salt content around the world	Published (World Action on Salt, 2011)
Calories in fast foods	Australia, UK, USA, France, NZ, Canada, Spain	Data currently being collected on calorie content of fast food products from major chains	In process
Regional nutrient composition			
Fat, sugar and salt levels in processed foods	Pacific Island Countries	Currently underway	In process
Changes over time			
Sodium content in bread	Australia:NZ	Mean sodium content of bread in Australia did not change over 5yrs; in NZ minor reduction of 7%	Published (Dunford et al., 2011a, 2011b)
Sodium levels in processed foods	Australia	No change in sodium content of processed meat, bread or cereals, but increase in sauces	
Sodium levels in processed foods	Costa Rica	Currently underway	In process
Brand-specific data for dietary analysis			
Mongolia		Brand-specific nutrient data to be added to Mongolian dietary analysis software	In process
Australia		Brand-specific nutrient data added to Australian dietary analysis software	Complete
Implications of nutrition labelling			
Analytical vs reported nutrients	Australia, Costa Rica	Good correlation between reported and analysed nutrients such as sodium	In process
Availability of healthier options and nutrition information for fast foods	New Zealand	Healthier options were lower in energy, total fat, saturated fat, sugar, and sodium than their regular counterparts.	Published(Chand et al., 2011)
Absence of nutrition labels	Solomon Islands, India, China, Costa Rica	Many products in these countries did not display nutrition labels	In process
Methodology			
Processed food protocol	All	Document to outline overall objectives of the Food Monitoring Group	Published(E. Dunford et al., 2011a, 2011b)
Fast food protocol	All	Document to outline methodology for monitoring nutrient content of fast food products globally	Published (Dunford et al., 2012a, 2012b)

targets and to document the success of different companies in achieving their stated goals. Extensive media reporting of the findings has been a feature of these analyses and has been an important contributor to the advocacy objectives of the groups.

The next major Australian piece of work will be to examine changes in the nutrient content of processed food products from 2008 to 2011 and provide an objective evaluation of the extent to which the Australian government's targets in this area have been achieved. Data from this work will be key to the iterative refinement and redevelopment of the Australian food reformulation program. A number of other countries are currently undertaking work examining the accuracy of labelled nutrition information by comparing the information provided on food labels to the values obtained from direct chemical analysis.

3.7. Funding

The project has obtained seed funding from the World Health Organisation. In addition, the Canadian Institute of Health Research has provided support for a program of work on sodium in the

Table A1
Variables to be collected[a] and format.

Primary	Format
Country	Country where data is collected
Food group	Refer to Appendix 1
Food category	Refer to Appendix 1
Brand name	As per product label
Manufacturer	As per product label
Product title	As per product label
Pack size	g or m
Serving size	g or m
Energy	kilojoules or kilocalories/100 g or 100 m
Saturated fat	g/100 g or 100 m
Total sugars	g/100 g or 100 m
Sodium[b]	milligrammes/100 g or 100 m
Data source	NIP, MANUF, WEB, DATAB, OTHER
Date of data collection	Date (dd/mm/yyyy)
Date of data entry	Date (dd/mm/yyyy)
Universal product code (UPC)	Number as per product barcode
Secondary[c]	
Total fat	g/100 g or 100 m
Trans fat	g/100 g or 100 m
Monounsaturated fat	g/100 g or 100 m
Polyunsaturated fat	g/100 g or 100 m
Protein	g/100 g or 100 m
Carbohydrate	g/100 g or 100 m
Dietary fibre	g/100 g or 100 m
Sub-category (major)	As defined for each country
Sub-category (minor)	As defined for each country
Country of origin	Country where product is manufactured
Ingredients list	Listing of ingredients on the label
Symbols and claims	Health or nutrient claims and symbols
Price	Cost of product per 100 g
Notes	As deemed important by each collaborating country

NIP, nutrition information panel; MANUF, direct from manufacturer; WEB, from internet site; DATAB, from external branded database.

[a] Countries will be required to indicate if the definition for a nutrient varies from that in the protocol.

[b] It will also be possible to submit data as salt in g/100 g or 100 m.

[c] Additional variables can be collected by each country as required (e.g. calcium).

Canadian food supply. Several other countries have submitted applications to government and non-government organisations seeking funding to support data collection and analysis in their countries. The Australian group has secured funding from Bupa Australia and has developed a smartphone application to assist countries in data collection. In addition, the Ecuadorian collaborators have sought support for the direct chemical analysis of products and the New Zealand group has requested funding to implement the use of mobile phone technology and to undertake analyses of the energy density and serving size of processed foods across five countries in the collaboration. A New Zealand member has also received support for a post-doctoral project called "NUTRITRACK: Reformulation of processed foods to promote health". Costa Rica has been successful in obtaining funding through the International Development Research Centre to undertake a project titled "Implementation of a population-wide program to reduce salt/sodium consumption in Costa Rica". Argentina has also secured funding from the same source to monitor changes in the nutritional content of foods.

4. Discussion

This global branded food database has been established by the Food Monitoring Group to provide objective and directly comparable measures of a core segment of the food supply in different countries around the world. The goal is to have data that can be used to motivate and guide food manufacturers and governments in their effort to improve the quality of foods and thereby address the enormous global burden of chronic diseases. The recent High-Level Meeting of the General Assembly of the United Nations (UN) highlighted the key role that diet has to play in chronic disease causation and the enormous potential for simple changes to drive massive improvements in health (O Hill, 2009). In common with other reports such as the EU Platform on Diet, Physical Activity and Health (European Union, 2005) and the WHO's Global Strategy on Diet, Physical Activity and Health (World Health Organisation, 2004) the meeting also served to focus attention on food reformulation as a key strategy to improve population diets (Webster, 2009).

The UN meeting (World Health Organisation, 2011b) also identified the role that international partnerships and monitoring efforts will play in the support and evaluation of efforts to prevent non-communicable diseases worldwide. Chronic disease and the quality of the food supply are global issues and programs of work that cross international boundaries will offer opportunities that national initiatives cannot. With many countries already undertaking work in the area of food composition, and tracking the changes that are achieved, it is a relatively simple step to standardise processes. By compiling data that are directly comparable it should be possible to more easily identify countries and companies that do and do not achieve improvements in food composition and learn from them. If examples of best practice can be highlighted, support and advice can more rapidly and efficiently be provided to those that are not making the improvements required. Data obtained through this project also have the potential to complement existing national reference food composition datasets, and can easily be adapted to the format required by the reference food composition community.

Already, data from the UK, Australia and New Zealand have provided a keen insight into the differences in progress made by different countries and companies. Average salt levels in UK foods are systematically and substantially lower than those in almost every corresponding food category in Australia, clearly demonstrating the potential for sector-wide changes (Ni Mhurchu et al., 2011). Mean salt levels in Australian bread products have remained static for four years despite this being the first target for the Government's salt reduction efforts highlighting the need for an urgent review of the current strategy (Dunford et al., 2011a, 2011b). And the same companies operating in Australia and New Zealand are moving salt levels up in one jurisdiction and down in the other, emphasising the need for trans-national coordination of efforts.

Another key component of this project has been the participation of low and middle income countries. Non-communicable diseases are now the leading cause of death in all but the very poorest nations and diet-related conditions predominate (World Health Organisation, 2011a). WHO funding has enabled the collection of initial food composition data in the Western Pacific Region. Tools and materials developed through this collaboration and the support offered by the secretariat have enabled the methodologies to be adapted for each individual country involved. Similarly, some participating countries have been successful in obtaining funding to undertake related work; Costa Rica and Argentina have both secured funding from the International Development Research Centre.

In conclusion, this research effort remains in its infancy but the potential for this global branded food composition database to provide new comparative information about the composition of processed foods in multiple countries around the world has been met with great support. There is a clear belief and intent that the data collected can be used to drive progressive, manageable, across-the-board reformulation of processed food products globally. With sustained small-to-moderate improvements in the food

supply projected to reap significant public health gains this is a project of increasing global importance.

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Appendix

See Table A1 below.

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