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Abstract

Background: Chronic diseases are the leading cause of premature death and disability in the world with overnutrition a primary cause of diet-related ill health. Excess energy intake, saturated fat, sugar, and salt derived from processed foods are a major cause of disease burden. Our objective is to compare the nutritional composition of processed foods between countries, between food companies, and over time.

Design: Surveys of processed foods will be done in each participating country using a standardized methodology. Information on the nutrient composition for each product will be sought either through direct chemical analysis, from the product label, or from the manufacturer. Foods will be categorized into 14 groups and 45 categories for

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the primary analyses which will compare mean levels of nutrients at baseline and over time. Initial commitments to collaboration have been obtained from 21 countries.

Conclusions: This collaborative approach to the collation and sharing of data will enable objective and transparent tracking of processed food composition around the world. The information collected will support government and food industry efforts to improve the nutrient composition of processed foods around the world.

Keywords

Food composition databases, food industry, public health nutrition, monitoring

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Background

Chronic diseases are the leading cause of premature death and disability in the world and cause the greatest proportion of disease burden in all but the least developed countries.¹ These diseases are largely attributable to poor diet, with overnutrition a major cause of diet-related ill health.¹ In developed countries the majority of food eaten is processed or pre-prepared by the food industry.² This industry and associated distribution networks have enabled a constant supply of affordable food.³ However, a large proportion of the world's population is now exposed to foods that are energy dense and high in saturated fat, sugar, and salt.⁴⁻⁶

The central role of the food supply in the causation of chronic disease is well recognized^{4,6} and the food industry has come under increasing pressure to improve the quality of processed foods. Many national and international organizations have provided guidance on issues such as food reformulation, advertising, and labelling.⁷⁻¹¹ Subsequently some multinational corporations have publicly acknowledged the important role they play and announced strategies to improve their product portfolio. Some have already delivered improvements^{12,13} while others have made either no commitment or are failing to take actions promised.

In most countries, governments have been reluctant to impose additional regulation on food manufacturers, relying instead on self-regulation or voluntary codes of practice. These approaches have delivered progress in food reformulation in a few countries¹⁴⁻¹⁶ but are weak unless compliance programmes are in place. Ongoing monitoring of changes to product formulation has the potential to drive change in the nutrient composition of processed foods by highlighting those that are making advances and those that are not. This information will provide governments, industry nutritionists, health professionals, and advocacy groups with new evidence to drive changes in the nutrient composition of processed food to improve

population health. Accordingly, this new global collaborative project brings together developed and developing nations in an initiative that will compare and monitor the composition of processed foods in diverse regions of the world.

Overall goal and objectives

The overall goal of this project is to collate nutrient composition data for processed foods in different countries with the objective of improving the nutritional composition of the world's processed food supply. Information about product composition will be collected in a standardized format in a number of countries and compared. A particular focus of the project will be supporting the participation of low- and middle-income countries. The primary outcome measures to be assessed will be energy content, saturated fat, total sugar, sodium, and serving size, in line with the World Health Organization's global strategy on diet, physical activity, and health.¹ There will be three main objectives:

1. compare mean levels and ranges of the primary outcome measures in each food category between countries;
2. compare mean levels and ranges of primary outcome measures for food categories between companies. Comparisons for this objective will be restricted to companies manufacturing comparable product lines;
3. track changes over time in mean levels and ranges of the primary outcome measures in food categories by country and company.

Design

This project will comprise ongoing surveys of processed foods in countries around the world that will

document the composition of the main processed foods available for purchase. The same basic methodology will be applied in each country to enable comparisons at baseline and tracking of over time. Results will be fed back to governments, manufacturers, food retailers, advocacy groups, and other stakeholders. The goal will be to report on how each country and company compares and encourage the food industry and policy makers to move the production of processed food towards healthier formulations.

Countries included

The intent is to include a broad geographic coverage of countries. There will be no restriction on the countries that can participate, although in practice the availability of data and resources will initially limit the countries involved. In some countries processed foods may mostly be consumed in specific areas, such as developed urban regions. In such cases data may be representative of one area rather than the whole country.

Foods included

Each participating country will be asked to describe an objective and repeatable strategy for identifying foods to be included. The precise methodology for selecting foods will vary between countries but it is anticipated that the products included will mostly derive from in-store surveys done in large retail outlets in urban areas. The goal will be to collect data on a sample of processed foods that is representative of the majority of products available for sale in a given region. Throughout this document, 'processed food' refers to foods that have been altered from their natural state either for safety reasons or for convenience (e.g. canned, refined).

Depending upon the resources available, collaborating countries will determine the most feasible way to collect data. Strategies may include:

- comprehensive nutrient information for all product categories: if adequate resources are available, this is the preferred approach. A major retail outlet (or set of outlets) will be identified, a full listing of all foods for sale recorded and the primary variables sought for each product. If resources permit, secondary variables will also be collected (Table 1);
- data for selected product categories or nutrients: where resources are limited, initial efforts may be restricted to specific food categories and/or nutrients of interest. For example, if the focus is sodium reduction then priority food categories may be bread, cereals, and processed meats. Collaborators

will be encouraged to collect the full set of primary variables wherever possible and to use the same sampling method each year data are collected.

Some flexibility with study design has been retained to enable participating countries to develop pragmatic and easily repeatable sampling systems that suit their particular circumstances and level of resources. In reporting project findings, attention will be paid to the description of sampling methods in each country, the completeness of coverage achieved, and the potential for bias during data collection. Information in the database will be in English.

Data sources and data collection

Variables sought for each food product and their definitions are indicated in Table 1. Missing data will be recorded as such and products for which only company name and product name are available with no nutritional data will be recorded to highlight the absence of data. Wherever resources allow, the data entry process will be checked by selecting a random sample of entries and having a second researcher compare the database information against the original source. There will be three main sources of information:

1. data determined from chemical analysis of each product;
2. data copied from the nutrition information panels (NIPs) on product labels in-store;
3. data provided direct by manufacturers.

Data will be entered into a password-protected online database and data source recorded for each entry. Data entry will be done product by product or by upload of data from another electronic source.

Categorization of foods

Foods will be classified in a hierarchical structure to food 'groups', 'categories', and 'subcategories' (Supplementary material Appendix 1). The overarching goal for the categorization system is that it be broadly applicable internationally,^{17,18} based on existing branded food databases,¹⁹⁻²⁴ and reflect industry practices and consumer purchasing patterns. This will enable reporting that is easily interpretable by industry, government, and other stakeholders. Some food types may be specific to particular countries or regions so there will be some flexibility within the categorization system. For example, all countries will likely have the same categorization at a high level (e.g. 'bread') but subcategorization may differ (e.g. the definition of

Table 1. Variables to be collected and format

Variable	Format
Primary	
Country	Country where data is collected
Food group	Refer to Appendix I
Food category	Refer to Appendix I
Brand name	As per product label
Manufacturer	As per product label
Product title	As per product label
Pack size	Grams or millilitres
Serving size	Grams or millilitres
Energy	Kilojoules or kilocalories/100 grams or 100 millilitres
Saturated fat	Grams/100 grams or 100 millilitres
Total sugars	Grams/100 grams or 100 millilitres
Sodium ^a	Milligrams/100 grams or 100 millilitres
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^b	
Total fat	Grams/100 grams or 100 millilitres
Trans fat	Grams/100 grams or 100 millilitres
Monounsaturated fat	Grams/100 grams or 100 millilitres
Polyunsaturated fat	Grams/100 grams or 100 millilitres
Protein	Grams/100 grams or 100 millilitres
Carbohydrate	Grams/100 grams or 100 millilitres
Dietary fibre	Grams/100 grams or 100 millilitres
Subcategory (major)	As defined for each country
Subcategory (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 grams
Notes	As deemed important by each collaborating country

Countries will be required to indicate if the definition for a nutrient varies from that in the protocol. ^aIt will also be possible to submit data as salt in grams/100 grams or 100 millilitres. ^bAdditional variables can be collected by each country as required (e.g. calcium). DATAB, from external branded database; MANUF, direct from manufacturer; NIP, nutrition information panel; WEB, direct from internet site.

'flat' bread may differ between countries). This will enable appropriate flexibility in data collection and reporting of results.

Analysis and reporting of data

Analyses will initially focus on the primary outcome measures (Table 1) with separate analyses done for each country and companies within each country. There will be tabulations that summarize the number of products in each food group and each category and the completeness of the data. Mean levels (and ranges)

for nutrient values will be calculated overall and separately for leading companies. Primary analyses will be reported per 100 g with additional estimates made per serve. Mean values of nutrients will be compared between companies, between countries, and over time.

Current status

Data for Australia, India, China, and Fiji have been collected and entered into the database for proof of concept, comprising full nutritional information for >10,000 products and partial information for several

thousand more. Initial feasibility assessments suggest data will be available by the end of 2012 for most participating developed countries and data for developing countries will be available for most products provided by larger companies. The challenge will be obtaining data describing the nutrient content of processed foods manufactured by local operations in developing countries where package labelling is not usually mandated and direct chemical analysis may be required.

Management, data sharing, and authorship

The project will be managed by an operational Secretariat at The George Institute for Global Health in Australia. High-level decisions about the direction of the initiative will be made by the management committee which will comprise one nominated representative from each participating country (members listed in Acknowledgements). Each management committee member may nominate other individuals involved as members of the Food Monitoring Group.

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 communications using their own data. Analyses and outputs involving data from two or more countries will require agreement from the management committee member of each country involved. For publications involving all countries in the collaboration, the Secretariat will take responsibility for ensuring sign off is obtained from all members. Authorship of primary publications will be in the name of the collaborative group (Food Monitoring Group). Authorship of publications involving a limited number of countries will be at the discretion of the relevant management committee members.

The Secretariat will not provide datasets from any country to a third party and collaborators from one country will not have the capacity to pass on the dataset of another country. External access to the full datasets will only be provided if all management committee members agree. 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 collaborations established by the management committee members as part of efforts to improve the quality of the food supply.

Discussion

We have established an international collaborative group with the interests, skills, capacity, and

enthusiasm required to establish a new global branded food composition database. The initiative has the potential to motivate and guide food manufacturers and governments to improve the quality of the food supply at both the national and global level.²⁵ In particular we hope the project can be used to drive category-wide changes in the composition of processed foods, which even if small, have potential to deliver large health gains.²⁶ Early project outputs will allow for between country and between company comparisons and these analyses will set the baseline against which future progress can be recorded.

This is by no means the first food composition database project but it is unique in several important ways. First, the project is an open collaboration with all contributors having access to data collected. Existing databases generally have closely controlled access and the ability of public health researchers to report on key findings can be constrained by industry, government, or another group with commercial or other interests in the data. A second point of difference is the project's global ambitions with most existing projects being national or regional.^{27,28} Chronic disease and the quality of the food supply are global problems and programmes of work that cross international boundaries will offer opportunities that national initiatives cannot. It will be possible to identify countries and companies that do and do not achieve improvements in food composition with promotion of examples of best practice and highlighting of those areas most in need. Many collaborators have strong records of accomplishment in engagement with governments, industry, and advocacy groups and a commitment to delivering real improvements to the food supply. This mix of academic research and policy skills has been used to inform the design of the project and will be central to the effectiveness of the planned programme of work. Finally, the project seeks to collect data in the same format over time. This will make direct quantitative comparisons between diverse regions of the world possible and allow for robust tracking of changes in food composition. In many countries voluntary agreements are the basis for commitments to improving the food supply and the presence of an independent third party that can objectively document success or failure will be a significant advance.

A limitation of this project is that it involves selected countries and is not globally representative in its initial membership. It is anticipated that additional countries will become involved over time and the protocol has been designed to enable this. The absence of readily available nutrition information for products in some countries will also limit the analyses that can be done. However, highlighting the absence of food composition data will be an important secondary output which will

be used to drive policy changes advocating greater transparency. Inaccuracy of labelled nutritional information, which can vary by up to 20% from the analysed figure, will be an issue for countries that obtain data direct from product labels. However, unless there is systematic over- or underreporting, this should not adversely affect the main project goals, which will report on mean levels of primary outcome measures in large numbers of products combined. Finally, information on market share will not be collected for every country involved. While sales-weighting would be ideal, access to this information will be difficult for many countries and in some cases could limit the ability to share data.²⁹

In conclusion, this project will provide new information about the composition of processed foods in multiple countries around the world. The standardized format of the data will allow for powerful new comparisons and objective monitoring of changes over time. Information about food composition has been used to good effect in countries where clear improvements in the supply of processed foods have been achieved.²⁸ However, such data continue to be absent for many nations and have not been compiled in this way to date. The data collected here will be used to drive progressive, manageable, across-the-board reformulation of processed food products globally. Sustained small-to-moderate improvements in the food supply will reap significant public health gains and avert much premature chronic disease.

Acknowledgements

For full details of the initial management committee members of the Food Monitoring Group and other contributors to the collaboration please refer to the online supplementary material.

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Conflict of interest

None to declare.

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