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Study Review

Food composition data in Argentina: A systematic review of the literature

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ABSTRACT

Food composition data are essential for the assessment of nutrient intake and the development of food policies. The aim of this study was to conduct a systematic review of available published data not previously included in the national food composition table in Argentina (ARGENFOODS), in order to supplement the existing information. An electronic literature search was conducted of literature published from January 1997 to December 2012. An annotated search for non-indexed 'gray literature' was also completed. Quality of data was assessed in terms of sampling and analytical criteria. A total of 2474 potentially eligible references were identified, out of which 138 articles and reports met inclusion criteria. These studies provided information about energy value, macronutrients, micronutrients, and/or other components, such as phytochemicals, for 82 individual food items and multi-ingredient foods. Cereals, legumes and their derivatives, milk and dairy products, meat, fish and fish derivatives were the most frequently reported food groups. Non-representative sampling and poor description of the analytical quality control used were the most frequent issues found in evaluation of data quality. These results will contribute to the continuous and systematic updating of food composition databases, which are of paramount importance for public health. Collaboration among data generators, compilers, and users is essential.

Contents

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1. Introduction

Since chronic diseases are the leading causes of illness, disability and death in Argentina (Institute for Health Metrics and Evaluation et al., 2013), thorough nutritional epidemiology analysis is necessary to understand reasons and implement significant changes. Food composition databases (FCDs) are required for the assessment of nutrient intake at the individual, regional, national, or international level. In addition, they are important sources of information for the development of food policies and for planning and evaluating epidemiological and intervention programs. Their use, however, is not limited to the fields of nutrition science and public health – the food industry, policy-makers, and consumers might also need and use this information (Guenther, 1994; Pennington et al., 2007).

Usually, food composition data are developed by international organizations, governments, universities and/or industries for different purposes. The Latin American Network of Food Data Systems (LATINFOODS) is a Latin American organization affiliated with the International Network on Food Data Systems (INFOODS) involved in the generation and compilation of data on the composition of foods (Masson, 1999; Samman et al., 2009). LATINFOODS includes the Argentine regional center, called ARGENFOODS (2010) whose activities include the analysis of food content and the collection and compilation of food data to enhance the exchange of information through the international electronic network and to increase the dissemination and use of food data. During the last decade, FCDs have been available online in several countries (Machackova et al., 2013; Sugiyama Jogakuen University, 2000; University of Sao Paulo), including Argentina (ARGENFOODS, 2010). The ARGENFOODS FCD has been recently updated to include information provided by a regional project which was sponsored by the Food and Agriculture Organization (FAO) of the United Nations. The project included direct analyses of five priority foods, professional training, revision and compilation of data of 258 foods in the ARGENFOODS Table (Samman and P-M-de-Portela, 2010; Samman et al., 2011; Blanco-Metzler et al., 2014). Despite the importance of these initiatives, information related to food composition in Argentina and other countries in the region is not only a bit dated with respect to latest changes but also incomplete. Thus actions can be taken not only to update the existing data, but also to improve the quality of information by involving food composition data generators, independent researchers, universities, industries, government and non-government organizations to collaborate with the Argentine food database.

Both the growth of global trade of food over the last 40 years in developed and developing countries (FAO, 2002 and FAO, 2004) and the shift toward chronic diseases have added complexity to nutritional epidemiological analyses as more data on nutrients and other components of foods are required. During the last decade, the national food industry has introduced several reformulations of food products for various reasons, mainly: new developments, marketing, and modification or replacement of some components or ingredients in order to comply with food policy regulations. Additionally, the continuous growth in the variety of food products available requires updated, detailed information. For these reasons, it is necessary to supplement the information available in the national food table with other reliable sources. The "Software for Food Surveys Analysis (SARA)," was developed for the first National Health and Nutrition Survey (ENNYS, 2004), conducted in 2004–2005 in Argentina. SARA allowed the calculation of nutrient intake by supplementing information from the ARGENFOODS Table with other food data sources (SARA, 2005). However, one decade after SARA, the food tables must be updated due to the emergence of new food products and modifications in the formulations of foods previously included.

The aim of this study was to conduct a systematic review of available published and non-published literature not currently included in the national food composition table in Argentina in order to complement the existing information on the composition of Argentine foods.

2. Materials and methods

2.1. Search strategy

We conducted a systematic search for articles published from January 1997 to December 2012 in MEDLINE, EMBASE, CAB Abstracts, LILACS, SciELO, FSTA, Agricola, and the Cochrane Library, using generic and academic Internet searches and meta-search engines. In the computer-based searches, we combined search terms related to the foods or subgroups of foods (such as food OR diet OR dietary fats OR cereals OR dairy products, for example) and components of interest (nutritional composition OR nutrients OR fatty acids OR sodium, for example). The complete search strategies used can be found in the Supplementary Data 1. An annotated search strategy for non-indexed 'gray literature' was also conducted to obtain information from relevant sources, such as reports from Ministries of Health, from the libraries of national universities such as the School of Nutrition of Córdoba National University, the University of Buenos Aires, and the National University of Litoral, and from Congresses' annals. The search was conducted according to a protocol based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Liberati et al., 2009; Moher et al., 2009). The information retrieved was supplemented by a structured survey administered by telephone and email to experts in the field and to institutions responsible for producing food composition information in the country.

2.2. Selection criteria and data screening

We included nutritional composition studies related to foods, food products, and beverages conducted in Argentina with data collection from 1995 onwards, which used validated analytical methodology. A wide range of quantitative study designs was included, as long as extractable data were available. We considered information about any food/food product included (or not) in the Argentinian database with the aim to update or verify existing information. However, we excluded data already included in ARGENFOODS database in order to prevent duplicate information. Before the information was extracted, we looked for the same product and component/s in the ARGENFOODS Table and checked the nutrient values. If the values reported in the article and the database were identical, we assumed that the source of the information was the same and therefore excluded the article; however, if the article reported data for any of the components not listed in ARGENFOODS Table, we included only these components. Other exclusion criteria were studies about animal feed or experimental foods not included in the Argentinian market and studies with duplicate information.

First, pairs of reviewers independently evaluated assigned articles by title and abstract according to pre-specified criteria. Secondly, the reviewers assessed aspects of the methodological quality, and thirdly, data were textually extracted from full papers. Main extracted variables included: first author, publication year, variables related to the identification of the specific food in the database (such as name/s, part/s, processes, raw/cooked), energy value, macro and micronutrient content, values of other components, analytical methods, and number of samples, among other