Appetite 59 (2012) 464–470

Contents lists available at SciVerse ScienceDirect

Appetite

journal homepage: www.elsevier.com/locate/appet

Research report

Nutritional quality of Australian breakfast cereals. Are they improving? ☆

Jimmy Chun Yu Louie [a,e], Elizabeth K Dunford [b,c,*], Karen Z Walker [d], Timothy P Gill [a]

[a] Cluster for Public Health Nutrition, Boden Institute of Obesity, Nutrition, Exercise and Eating Disorders, The University of Sydney, NSW 2006, Australia
[b] The George Institute for Global Health, Camperdown, NSW 2050, Australia
[c] School of Public Health, The University of Sydney, NSW 2006, Australia
[d] Department of Nutrition and Dietetics, Monash University, Melbourne, Vic. 3168, Australia
[e] School of Health Sciences, Faculty of Health and Behavioral Sciences, The University of Wollongong, NSW 2522, Australia

ARTICLE INFO

Article history:
Received 20 March 2012
Received in revised form 28 May 2012
Accepted 15 June 2012
Available online 21 June 2012

Keywords:
Breakfast cereals
Nutritional quality
Traffic light labelling
DIG labelling
Australia

ABSTRACT

The nutritional quality of Australian breakfast cereals is not systematically monitored despite the importance of breakfast for general health. We examined whether the nutritional quality of Australian breakfast cereals has improved between 2004 and 2010, and whether any change could be detected after the introduction of Daily Intake Guide (DIG) front-of-pack labelling. Supermarket surveys were conducted in 2004 and 2010 using the same methodology to collect information from the nutrition information panels of Australian breakfast cereals and the nutrient content of cereals was compared by year. Breakfast cereals with and without DIG labelling in 2010 were also compared. Nutritional quality was assessed using UK Traffic Light criteria. No significant difference was detected in nutritional composition of breakfast cereals between 2004 and 2010. There was no notable improvement in nutritional composition of breakfast cereals marketed as the same product in both years. Overall there has been little improvement in the nutritional quality of Australian breakfast cereals in the 6 year period. A large proportion of Australian breakfast cereals were considered high sugar. In conclusion, the introduction of DIG labelling does not appear to have promoted product reformulation, and breakfast cereals carrying DIG labels were not consistently healthier.

Introduction

Australians eat breakfast more than five days a week, around 50% of the time they choose to eat breakfast cereals (Williams, 2002). Consumption of breakfast cereals is associated with improved overall diet quality (Albertson et al. 2008; Gibson & Gunn, 2011; Nicklas, O'Neil, & Berenson, 1998; Williams, 2007; Wilson, Parnell, Wohlers, & Shirley, 2006), and improved mental and physical performance (Nicklas, Myers, Reger, Beech, & Berenson, 1998; Rampersaud, Pereira, Girard, Adams, & Metzl, 2005). This may be because they are a good source of whole grains and commonly eaten with milk. Whole grains are rich in dietary fibre and both grains and milk will improve micronutrient intake (Coudray, 2011; Drewnowski, 2011; Vissers, Streppel, Feskens, & de Groot, 2011; Williamson, 2010). Breakfast cereals are often now also fortified with vitamins such as folate and thiamine (Berner, Clydesdale, & Douglass, 2001; Hannon, Kiely, & Flynn 2007).

Regular consumption of breakfast cereals has also been associated with lower body weight (Albertson, Anderson, Crockett, & Goebel, 2003; Deshmukh-Taskar et al., 2010; Kafatos et al., 2005; Kosti et al., 2008; Panagiotakos et al., 2008; Song, Chun, Obayashi, Cho, & Chung, 2005; Williams, O'Neil, Keast, Cho, & Nicklas, 2009). For example, in a large national survey, American children and adolescents who regularly consumed breakfast cereals had lower body mass index-for-age *z*-scores, lower waist circumference and lower prevalence of obesity than children and adolescents who skipped breakfast (Deshmukh-Taskar et al., 2010). On the other hand, the high sugar and sodium content of many breakfast cereals is often criticised (CHOICE, 2010, Which?, 2006), particularly for those targeted at children (Harris et al., 2009; Pestano, Yeshua, & Houlihan, 2011; Schwartz, Vartanian, Wharton, & Brownell, 2008).

Food reformulation to reduce the intake of negative nutrients (i.e. nutrients that are harmful to health when consumed in excess)

☆ *Acknowledgements:* EKD is a Research Officer for the Australian Division of World Action on Salt & Health. All other authors declare they have no competing interest. All authors were involved in the conception of the study. KZW provided nutrition information for breakfast cereals from 2004, and EKD collected the 2010 data. EKD and KZW categorised the breakfast cereals. JCYL analysed the results. All authors were involved in interpretation of the results and made significant contributions to the discussion. JCYL drafted the manuscript. All authors were involved in the subsequent edits of the manuscript, and have read and approved the final manuscript. *Funding source:* This study was funded by the internal revenue of The George Institute for Global Health, and the Sydney University Nutrition Research Foundation. EKD is supported by a Sydney Medical School Foundation Postgraduate Scholarship.

* Corresponding author.
E-mail address: edunford@georgeinstitute.org.au (E.K Dunford).

0195-6663/$ - see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.appet.2012.06.010

is a potentially important public health strategy. For example, one study found that the Australian Heart Foundation Tick program had prompted an average reduction of 40% in sodium in Australian breakfast cereals. This would translate to a reduction in the salt intake of Australians approximating to 235 ton per year (Williams, McMahon, & Boustead, 2003). Because breakfast cereals are a popular breakfast choice (Albertson et al., 2003; Grieger & Cobiac, in press; Rangan, Kwan, Louie, Flood, & Gill, 2011; Williams, 2002), there is considerable potential to enhance nutrition through reformulation. However, strong incentives may be required to encourage food manufacturers to reformulate their products, as the process can require considerable research and development investments. It has been suggested that one way to drive a change towards reformulation is through the introduction of front-of-pack labelling (FOPL). Consumers are becoming more health conscious (Food Standards Australia New Zealand, 2007), and if they have access to clear FOPL their understanding of the nutritional quality of the food products may improve and their purchase of less healthy products may decline (Grunert & Wills, 2007; Ni Mhurchu et al., 2011). This in turn could encourage product reformulation to boost sales.

In November 2006 the Australian Food and Grocery Council introduced a Daily Intake Guide (DIG) FOPL scheme aiming to assist consumers in making healthier food choices (Australian Food and Grocery Council, 2010b). Display of a DIG is voluntary and food manufacturers can choose from a wide variety of labelling options including; an energy only DIG label, an energy *plus* vitamin/mineral DIG, a simple DIG providing information only on energy, fat, saturated fat, sugars and sodium content, a full DIG label containing information on energy, protein, total fat, saturated fat, total carbohydrates, sugars and sodium, or a full DIG label plus additional DIG for micronutrients (Australian Food and Grocery Council, 2011). At present over 4600 food products sold in Australia carry DIG labelling (Australian Food and Grocery Council, 2012), where a simple DIG or a full DIG plus additional DIG for micronutrients was commonly displayed on Australian breakfast cereals. Similar systems have also been introduced and adopted by manufacturers and retailers in Europe and US (Confederation of the Food and Drink Industries in the EU, 2011).

An alternate FOPL system, the Colour-Coded Traffic Light Labelling, has been developed by the Food Standards Agency in the UK in 2007 (Food Standards Agency, 2007). This system categorises the 4 key negative nutrients most associated with public health issues (fat, saturated fat, sugars and salt) as high, medium or low compared to a set of agreed criteria based on the Guideline Daily Amount (GDA) on a per 100 g basis (Department of Health, 1991; European Union, 2006). These nutrients are then each given a 'red', 'amber' or 'green' rating. Public health groups have been advocating for the introduction of the Colour-Coded Traffic Light Labelling, which has been demonstrated to most consistently help consumers identify healthier products (Hawley et al., in press; Kelly et al., 2009; Louie, Flood, Rangan, Hector, & Gill, 2008). The system has recently been considered for introduction to Australia (Blewett, Goddard, Pettigrew, Reynolds, & Yeatman, 2011).

Despite the adoption of DIG and similar systems by manufacturers and retailers around the world (Australian Food and Grocery Council, 2010a; Confederation of the Food and Drink Industries in the EU, 2011), there is limited assessment of the impact of FOPL on the reformulation of breakfast cereals or other foods. In addition, there has been no systematic monitoring of the nutritional quality of Australian breakfast cereals. Therefore the primary objective of this project was to investigate whether the nutritional quality of Australian breakfast cereals has improved from 2004 to 2010, and whether the introduction of DIG labelling resulted in any detectable nutritional change.

Materials and methods

Data collection

A systematic supermarket survey of all breakfast cereals offered for sale was conducted in 2010 to collect data from the nutrition information panel (NIP) on packages of Australian breakfast cereals and compared to data previously collected in the same manner in 2004. Methods of collection for the 2004 data have been reported previously (Woods & Walker, 2007). In brief, between August and September 2004, a surveyor systematically collected nutrition information from all packaged breakfast cereals ($n = 164$), including those shelved in the health food section, presented for sale in a large chain supermarket in metropolitan Melbourne, Australia. Data were recorded on standardised entry sheets, which included information on brand name, product title, suggested serving size, and per 100 g content of energy, protein, total fat, saturated fat, total available carbohydrates, sugars, dietary fibre and sodium. It should be noted that 'suggested serving size' is that recommended by the manufacturer, and does not necessarily reflect the actual amount eaten by the consumers. Details of the ingredients list were not recorded as this was not the primary aim of the study.

Data for breakfast cereals available in 2010 ($n = 234$) were collected between October and November 2010 from supermarkets from the two major chains in metropolitan New South Wales using similar methodology. In addition to the variables collected in 2004, the presence of DIG labelling on the package was also recorded.

This study was deemed exempt from ethics approval by the University of Sydney Human Research Ethics Committee as it involved no direct human contact.

Accuracy of nutrition information panels

The accuracy of nutrition information collected from the NIPs was assessed by comparing the stated energy content on the label with energy content calculate from the stated macronutrient content. NIPs with stated energy which fell between 95% and 105% of calculated energy were considered to be plausible.

Assessment of nutritional quality

Assessment of micronutrient content of the breakfast cereals was not possible in this study because micronutrients are not required to be presented on the Australian NIP (Food Standards Australia New Zealand, 2009). We therefore focussed on the content of negative nutrients, namely: total fat, saturated fat, sugar and sodium. The content of these nutrients were classified as 'low', 'medium' or 'high' based on the Traffic Light Labelling criteria developed by the UK Food Standards Agency (FSA) (Food Standards Agency, 2007), where cut-offs of these nutrients on a per 100 g basis (Table 1) were applied. These criteria were chosen as this system has recently been considered for introduction to Australia (Blewett et al., 2011).

It was not possible however to accurately differentiate between natural sugars (e.g. sugars in dried fruits) and added sugars as required by the FSA criterion as this information is lacking in an Australian NIP (Food Standards Australia New Zealand, 2009). To estimate the added sugar content of the breakfast cereals included in this study, a sub-study of 30 Australian breakfast cereals containing dried fruit manufactured by major breakfast cereal companies in 2011 was conducted, where their ingredient lists were recorded and analysed. In Australia it is a requirement to list the proportion of total product weight for 'characterising' ingredients in the ingredients list, and for these cereals, the characterising ingredients are their dried fruit content. The proportion of sugars