Appetite 117 (2017) 1–8

Contents lists available at ScienceDirect

Appetite

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

A comparison of the Health Star Rating system when used for restaurant fast foods and packaged foods

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ARTICLE INFO

Article history:
Received 26 October 2016
Received in revised form
26 March 2017
Accepted 7 June 2017
Available online 8 June 2017

Keywords:
Fast food
Health Star Rating
Reformulation
Public health
Food labelling

ABSTRACT

Background: In June 2014, the Australian government agreed to the voluntary implementation of an interpretive 'Health Star Rating' (HSR) front-of-pack labelling system for packaged foods. The aim of the system is to make it easier for consumers to compare the healthiness of products based on number of stars. With many Australians consuming fast food there is a strong rationale for extending the HSR system to include fast food items.
Objective: To examine the performance of the HSR system when applied to fast foods.
Design: Nutrient content data for fast food menu items were collected from the websites of 13 large Australian fast-food chains. The HSR was calculated for each menu item. Statistics describing HSR values for fast foods were calculated and compared to results for comparable packaged foods.
Results: Data for 1529 fast food products were compared to data for 3810 packaged food products across 16 of 17 fast food product categories. The mean HSR for the fast foods was 2.5 and ranged from 0.5 to 5.0 and corresponding values for the comparator packaged foods were 2.6 and 0.5 to 5.0. Visual inspection of the data showed broadly comparable distributions of HSR values across the fast food and the packaged food categories, although statistically significant differences were apparent for seven categories (all $p < 0.04$). In some cases these differences reflected the large sample size and the power to detect small variations across fast foods and packaged food, and in others it appeared to reflect primarily differences in the mix of product types within a category.
Conclusions: These data support the idea that the HSR system could be extended to Australian fast foods. There are likely to be significant benefits to the community from the use of a single standardised signposting system for healthiness across all fresh, packaged and restaurant foods.

1. Introduction

Diet-related diseases including obesity, type 2 diabetes and cardiovascular diseases are increasing globally (World Health Organization, 2014) in conjunction with consumption of packaged and fast foods (Jacobson, Havas, & McCarter, 2013; Rosenheck, 2008). With an increasing proportion of consumers purchasing meals outside the home, fast food is now an important contributor to intake of dietary salt, sugar, saturated fat and energy (Paeratakul, Ferdinand, Champagne, Ryan, & Bray, 2003; Rangan, Schindeler, Hector, Gill, & Webb, 2009). Fast foods tend to be more energy dense, higher in saturated fat, added sugars and salt, and to be eaten in larger portions compared to other foods (Isganaitis & Lustig, 2005; Nielsen & Popkin, 2003; Pereira et al., 2005) and now provide between one-third and one-half of daily energy intake, but less than one-quarter of most micronutrients (Australian Bureau of Statistics, 2014; Rangan et al., 2009).

Globally, there are a number of initiatives that have been undertaken to try and address the health problems caused by fast

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http://dx.doi.org/10.1016/j.appet.2017.06.005
0195-6663/

foods. Some restaurant chains have made commitments to product reformulation (McDonald's, 2013; Yum! Brands. Yum! Brands, 2014) and others to controls on marketing to children (Australian Food and Grocery Council, 2011). In some countries like the US, the labelling of calories on fast food chain menu boards is required (U.S. Food and Drug Administration, 2016). Other countries such as the UK have voluntary initiatives in place (UK Department of Health, 2012). In Australia, the state of New South Wales (NSW) now has a statutory requirement for fast food chain restaurants with more than 20 outlets in the state or 50 nationally to display the energy (kilojoule) content of products on menu boards displayed at the point of sale (NSW Food Authority, 2011).

In parallel the Australian Government has implemented a voluntary interpretive front-of-pack labelling system for packaged foods, which is designed to be consistent with, and used alongside, the Australian Dietary Guidelines (Australian Health Ministers' Advisory Council, 2016). The aim of the 'Health Star Rating' (HSR) system is to make it easier for consumers to identify healthier products. The system assigns a value between 0.5 and 5.0 stars, in half star increments, with a higher number of stars indicating a healthier product. The algorithm used to calculate the HSR incorporates energy, saturated fat, total sugar, sodium, fibre, protein, and fruit, vegetable, nut and legume content (FVNL) per 100 g.

No other country to date has explored the implementation of a standardised labelling scheme across both packaged foods and fast food menu boards. Although not specifically designed for fast food products, the HSR system may be a tool that can provide information about the relative healthiness of different fast food products to consumers. Further, the use of a single, standard method of signposting across packaged foods and fast foods might simplify decision making for consumers. Accordingly, this study sought to examine the performance of the HSR system when applied to fast foods.

2. Methods

2.1. Data sources

Fast food data - The George Institute and the Cancer Council of New South Wales collated a fast food database with all available nutrition information for leading Australian fast food chains. Methods have been previously described (Dunford, Webster, Barzi, & Neal, 2010; Garcia, Dunford, Sundstrom, & Neal, 2014) but, in brief, data were obtained from the websites of the most popular Australian fast food chains in November 2014. Where available, the company name, product name, nutrient values per 100 g; energy (kJ), protein (g), saturated fat (g), sugar (g), sodium (mg), fibre (g), FVNL% and ingredient lists were recorded. Where per 100 g values were not available, but nutrient values per serving and the serving size was available, the per 100 g values for all nutrients were calculated. Accuracy of data entry was examined by selecting a random sample of 5% of the entries and comparing the information in the database against the original source. In addition, all data were subjected to a series of range and logic checks.

Packaged food data - were extracted from The George Institute's 2014 *FoodSwitch* Database (Dunford et al., 2014). Details have been described elsewhere (Dunford et al., 2012), but in brief, nutrient data are collected each year from the product labels of food items sold in four major Australian supermarkets. All data were subjected to an extensive series of range and logic checks.

2.2. Food categories included

Fast foods - The categories and definitions were based on those used for previous reports on Australian fast foods (Dunford et al., 2010; Garcia et al., 2014) and are derived from the categorizations commonly used by the fast food industry. There are 17 major food categories and multiple additional subcategories into which fast foods were placed (Supplemental Table 1).

Packaged foods - Categories of packaged foods that most closely matched the fast food categories were selected by reviewing the packaged food subcategories into which the products included in the *FoodSwitch* database are placed (Supplemental Table 1). Where several packaged food subcategories matched to one fast food category the packaged food subcategories were grouped and analysed as a single matching category. For one fast food category ('burgers') there was no matching packaged food category identified.

2.3. Calculation of the Health Star Rating

Calculation of the HSR was performed using criteria defined by the Guide to the Health Star Rating Calculator endorsed by the Australian Government (Australian Health Ministers' Advisory Council, 2016). The HSR system requires products to be categorized into Calibration Categories (non-dairy beverages such as fruit juice and sugar-sweetened beverages; core cereals such as rice and pasta; core dairy beverages; core dairy cheeses such as cheddar; core dairy yoghurt and soft cheese, fats and oils, fruit, vegetables, protein foods; and non-core foods). Calibration Categories were determined on the basis of the product name and ingredients list for both fast foods and packaged foods. FVNL content was not available for some products and estimates of FVNL were made using information from the ingredient lists and/or known values for similar food products (Dunford et al., 2014). Fibre content was likewise unavailable for some products and a comparable estimation method was used.

The HSR was calculated by (1) assigning baseline points for energy, saturated fat, total sugar and sodium content per 100 g; (2) awarding modifying points for FVNL content, protein and fibre where applicable; (3) calculating an overall score by subtracting modifying points from baseline points, with a lower score reflecting a more nutritious food product; and (4) assigning a HSR (from 0.5 to 5.0 stars in half-star increments) according to the overall score using the defined scoring matrix (Australian Health Ministers' Advisory Council, 2016).

2.4. Statistical analysis

Analyses were performed using Stata v14.1. The mean HSR value and the range of the HSR values were calculated for each fast food category and the corresponding packaged food category. Evidence of differences between the mean HSR of the fast foods compared to the processed foods was sought using unpaired t-tests. The distributions of HSR values were compared by graphing the proportions of products in each category assigned 0.5–1.5 stars, 2.0–3.0 stars and 3.5–5.0 stars. The graphical representations were inspected visually for comparability of the distribution of HSRs and statistical comparisons of the proportions of products in each stratum were made using Fisher's exact tests. Where the pattern of HSR values assigned to products appeared to be different between fast food products and packaged food products the distributions in subcategories were explored to determine the likely impact of product mix on the observed differences. Because FVNL values were imputed for many products an analysis was done comparing the HSR obtained with and without inclusion of the FVNL values in the algorithm.