



The Development and Application of a Tool for Quantifying the Strength of Voluntary Actions and Commitments of Major Canadian Food Companies to Improve the Nutritional Quality of Their Products

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ABSTRACT

Background: Canada's food supply is high in nutrients of public health concern, contributing to poor diet quality and increased noncommunicable disease risk. Food companies shape the healthfulness of the food supply, yet little is known about companies' voluntary actions and commitments concerning product (re)formulation.

Objective: This study aimed to develop and apply a tool for quantifying the strength of voluntary actions and commitments of major food companies in Canada to improve the healthfulness of their products.

Methods: Twenty-two top packaged food and beverage companies were selected based on Canadian market share. Recent actions and/or commitments to reduce energy/portion sizes, sodium, saturated fat, *trans* fat, and sugars were identified from company websites and public documents, verified by company representatives (where possible), and scored based on breadth of application across the product portfolio, magnitude(s) of reduction, measurability, nutritional significance, national/global applicability, and transparency using the Food Company Reformulation scoring tool. Companies offering beverages only ($n = 4$) were not assessed for sodium, saturated fat, or *trans* fat (re)formulation.

Results: Seventeen of 22 companies reported reductions and/or commitments concerning sodium (72.2%, $n = 13/18$), *trans* fat (61.1%, $n = 11/18$), sugars (59.1%, $n = 13/22$), saturated fat (55.6%, $n = 10/18$), and/or energy/portion sizes (50.0%, $n = 11/22$). Scores ranged from 0/155 to 122/155 for food companies (median = 49/155) and 0/65 to 42/65 for beverage companies (median = 17/65). Companies generally performed best for sodium reduction (median = 21/32; range = 0–32) and poorest for energy/portion-size reductions (median = 2/30; range = 0–24). Multinational companies had significantly higher total scores than domestic companies ($P = 0.004$). Higher total scores were associated with greater market shares in the beverage manufacturing sector ($P = 0.04$), but not packaged food ($P = 0.50$).

Conclusions: Many of Canada's leading food companies report limited or no action to reduce nutrients of concern in their products, suggesting a need for government intervention and strengthened accountability mechanisms to encourage alignment of reformulation efforts with government and expert recommendations. *Curr Dev Nutr* 2020;4:nzaa151.

Keywords: food company, reformulation, nutritional quality, nutrient, policy, commitment, evaluation

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Manuscript received July 21, 2020. Initial review completed September 16, 2020. Revision accepted September 18, 2020. Published online September 22, 2020.

This research was funded by a project grant from the Canadian Institutes of Health Research (CIHR) (MRL; #142300). L Vergeer is funded by a CIHR Frederick Banting and Charles Best Canada Graduate Scholarship Doctoral Award, an Ontario Graduate Scholarship, and a Department of Nutritional Sciences Graduate Student Fellowship from the University of Toronto. L Vanderlee was a CIHR Banting Postdoctoral Fellow at the University of Toronto at the time of the study. GS was supported by a Heart Foundation Future Leader Fellowship (102035) from the National Heart Foundation of Australia; he is also a researcher within the National Health and Medical Research Council Centres for Research Excellence entitled Reducing Salt Intake Using Food Policy Interventions (APP1117300) and a Centre of Research Excellence in Food Retail Environments for Health (RE-FRESH) (APP1152968) (Australia). ER is funded through an Australian Government Research Training Program (RTP) Scholarship. SM is funded by a Heart Foundation of New Zealand project grant. LY is funded by a Heart Foundation of New Zealand postdoctoral fellowship. CM is funded by CIHR Frederick Banting and Charles Best Canada Graduate Scholarship Doctoral and Master's Awards and an Ontario Graduate Scholarship Indigenous Scholar Award.

Author disclosures: CM completed a Mitacs graduate student internship placement at Nestlé Canada, funded by the Government of Canada Mitacs program. MRL reports grants from the Retail Council of Canada, Program for Food Safety, Nutrition and Regulatory Affairs, at the University of Toronto (with partial funding from Nestlé Canada), and Dairy Farmers of Canada; these grants are unrelated to the submitted work. None of these companies/organizations had any involvement in the present research. The other authors report no conflicts of interest.

The funders had no role in the design, execution, interpretation, or writing of the study.

Supplemental Table 1 is available from the "Supplementary data" link in the online posting of the article and from the same link in the online table of contents at <https://academic.oup.com/cdn/>.

Data supporting this manuscript have not been deposited in a repository. The data underlying this article will be shared on reasonable request to the corresponding author.

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Abbreviations used: ATNI, Access to Nutrition Initiative; BCI, Balance Calories Initiative; BIA-Obesity, Business Impact Assessment–Obesity and population-level nutrition; FCR, Food Company Reformulation; FOP, front-of-package; HSR, Health Star Rating; IFBA, International Food and Beverage Alliance; INFORMAS, International Network for Food and Obesity/Noncommunicable Disease Research, Monitoring and Action Support; NCD, noncommunicable disease; NP, nutrient profile; PHO, partially hydrogenated oil; SMART, Specific, Measurable, Attainable, Realistic, Time-sensitive.

Introduction

The prevalence of obesity and noncommunicable diseases (NCDs) has been increasing rapidly in Canada and globally, with an unhealthy diet identified as a leading risk factor for developing chronic disease (1). One important contributor to diet quality is the food supply in which consumers make food choices (2). Canada's food supply largely consists of highly processed, energy-dense products high in sodium, saturated fat, and/or free sugars (3–6).

Food and beverage companies play a critical role in shaping the nutritional quality of the food supply and, ultimately, the dietary patterns and food environments of Canadians (7). Reformulation of foods to reduce their energy density and contents of sodium, free sugars, and saturated fats—and eliminate industrially produced *trans* fats—is considered one of the most cost-effective policy measures for improving population nutrition and addressing the global obesity and NCD burden (8–12). Accordingly, the WHO has called on food and beverage companies to help create healthier food supplies by reformulating their existing products to make them healthier and/or developing new products of higher nutritional quality (11, 13). Companies can also improve the nutritional composition of their product portfolios by acquiring healthier brands or merging with the companies that own them, and by discontinuing less healthy food and beverage product lines or selling them off to other manufacturers (14). Comprehensive monitoring of food environments, including the policies and actions of food and beverage companies to improve the nutritional quality of their products, has been recommended to complement the WHO's NCD Global Monitoring Framework (2, 15, 16).

There has, however, been limited independent monitoring of food company policies and actions concerning product (re)formulation (i.e., altering the nutritional composition of existing products, development or discontinuation of products, and/or sales and acquisitions) to meet WHO-, national government-, and expert-recommended targets to promote healthy food environments for consumers. The Access to Nutrition Initiative (ATNI) was designed to evaluate food industry efforts to address obesity, undernutrition, and infant nutrition, and it assesses companies in terms of their policies, commitments, and reported actions in several nutrition-policy areas, including product (re)formulation (17–19). The ATNI tool was developed through consultation with stakeholders from governments, nongovernmental organizations, academia, and food and beverage companies (20). The most recent ATNI Global Index 2018 (preceded by the Global Index 2013 and 2016) found that several of the 22 multinational food and beverage companies assessed had committed to investing in “healthy” product development, increasing the percentage of healthier products within their portfolios, and developing or improving their own nutrient profile (NP) models (17). However, many companies had only established product (re)formulation targets for half of the product categories assessed, and these commitments were often poorly defined, resulting in an average score for the ATNI “product formulation” category of 3.4/10 (17).

The International Network for Food and Obesity/NCD Research, Monitoring and Action Support (INFORMAS) was established in 2012 as a group of researchers and public health organizations conducting long-term benchmarking and monitoring of national and global food environment policies and interventions (2). The Business Impact

Assessment–Obesity and population-level nutrition (BIA-Obesity) was developed by INFORMAS as a tool and process for identifying and evaluating policies, commitments, and practices of food and beverage companies concerning various policy areas related to population nutrition and obesity, including product (re)formulation (21). Compared with the ATNI, the BIA-Obesity is less resource intensive to implement and designed specifically for national-level assessments (as opposed to global) (21). The BIA-Obesity process involves 2 phases: 1) assessment of company policies and commitments concerning population nutrition and obesity and 2) evaluation of company practices and performance [e.g., examining the nutritional composition of a company's products in relation to their product (re)formulation commitments]. As of September 2020, BIA-Obesity phase 1 has been implemented in 5 countries (Canada, Australia, New Zealand, Malaysia, and Thailand) and is underway in an additional 4 countries (Belgium, France, South Africa, and Vietnam) (22–26). In Canada, most major packaged food and beverage companies reported recent or ongoing actions to improve the nutritional composition of their products, with sodium being the most commonly targeted nutrient and a median score for the product (re)formulation policy domain of 27/100 (22). The nutritional quality of products offered by top packaged food and beverage companies in Canada, Australia, and New Zealand has also been assessed as part of BIA-Obesity phase 2 (6, 14, 27). However, the 2 phases have not yet been examined in combination to compare changes in the nutritional composition of companies' products to their reported voluntary actions and commitments concerning product (re)formulation, in relation to WHO- and government-recommended targets.

While some companies have committed to changes in the overall nutritional quality of their products (e.g., based on government- or industry-developed NP models), others set company-specific nutrient targets (17, 28). Product (re)formulation commitments may apply to the entire product portfolio or be limited to certain food categories or brands, and are typically expressed as percentages of change (e.g., a 10% decrease in sugar content) or targets based on absolute amounts (e.g., ≤ 10 g of sugar/serving) (17). The differences in the types of commitments made have important implications for the accountability of the company, as well as for evaluations of the overall impact of product (re)formulation efforts on population-level nutrient intakes (17). For example, if a company has a broad set of commitments but sets a low magnitude of reduction or applies them to a narrow subset of products within the company's total portfolio, it is unlikely that these targets will result in meaningful reductions in intakes of nutrients of public health concern (29). Therefore, to help prompt significant improvements in the healthfulness of food supplies, it is important to assess and monitor the strength of product (re)formulation commitments and practices of major food companies over time in comparison to targets recommended by the WHO and governments.

Both the ATNI and BIA-Obesity evaluate food companies' reported actions and commitments concerning product (re)formulation. These evaluations focus on the breadth of the application of the nutrient target(s) across the company's product portfolio; the specificity, measurability, and nutritional significance of nutrient targets; their applicability across national markets; and transparency of reporting. However, the existing assessment criteria are limited in scope and granularity. For example, they do not include an assessment of the strength and absolute values (per 100 g or per serving) of food companies' nutrient-specific

TABLE 1 A summary of the largest packaged food and beverage companies in Canada ($n = 22$) in terms of their market share, type (i.e., multinational or domestic manufacturer, retailer), the geographic area served, location of their head office, and primary types of products offered

Company	Market share, ¹⁻⁴ %	Type (area served)	Head office location	Types of products offered
Packaged food and beverages ^{2,3}				
Agropur	4.0	Multinational (North America)	Canada	Dairy
Campbell Soup	1.0	Multinational (global)	USA	Beverages; condiments; snacks; soups
Canada Bread ⁵	1.5	Domestic (Canada) ⁵	Canada	Bread and bakery products
Danone	1.4	Multinational (global)	France	Beverages; dairy; desserts
General Mills	2.7	Multinational (global)	USA	Breakfast cereals; ready meals; snacks
George Weston	1.7	Multinational (North America)	Canada	Bread and bakery products
Kellogg	1.7	Multinational (global)	USA	Breakfast cereals and bars; snacks
Kraft Heinz	4.3	Multinational (global)	USA	Beverages; dairy; ready meals; snacks
Loblaws ⁶	6.2 (7.8) ²	Retailer (Canada)	Canada	Variety
Maple Leaf Foods	3.9	Domestic (Canada)	Canada	Meat and meat products
Mondelēz	2.6	Multinational (global)	USA	Confectionary; snacks
Nestlé	4.2 (9.8) ²	Multinational (global)	Switzerland	Beverages; confectionary; ready meals
Parmalat	3.5	Multinational (global)	Italy	Dairy
PepsiCo	3.0 (15.4) ²	Multinational (global)	USA	Beverages; breakfast cereals and bars; snacks
Beverages only ⁴				
Saputo	5.4	Multinational (global)	Canada	Dairy
Sobeys ⁶	2.5 (2.7) ²	Retailer (Canada)	Canada	Variety
Sun-Rype ⁷	1.3 ⁷	Multinational (North America)	Canada	Beverages; snacks
Unilever	2.2	Multinational (global)	Netherlands, UK	Beverages; condiments; frozen desserts
Beverages only ⁴				
A. Lassonde	4.5	Multinational (North America)	Canada	Beverages
Canada Dry Mott's	5.8	Multinational (North America)	Canada	Beverages
Coca-Cola	19.5	Multinational (global)	USA	Beverages
Ocean Spray ⁸	1.0	Multinational (global)	USA	Beverages; dried cranberries; cranberry sauce

¹Market share for Canadian packaged food and/or nonalcoholic beverage sales in 2016 (sourced from Euromonitor International).

²For companies that held $\geq 1\%$ of the 2016 Canadian market share for both packaged foods and beverages, the company's packaged foods market share is presented, followed by their beverages market share in parentheses.

³Company offers packaged food only or food plus beverages; unless otherwise noted, the market share listed refers to that in the packaged food manufacturing sector.

⁴Company offers beverages only; unless otherwise noted, the market share listed refers to that in the nonalcoholic beverage manufacturing sector.

⁵Canada Bread was acquired by the multinational company Grupo Bimbo in 2014 and operates as an independent business unit.

⁶Retailers offer packaged foods and beverages under private-label brands.

⁷Sun-Rype held 1.3% of the Canadian market share for beverage sales in 2016; since the company offers both beverages and packaged foods, it was assessed as a packaged food company (i.e., evaluated based on sodium, saturated fat, and *trans* fat reduction efforts, in addition to energy/portion sizes and sugars).

⁸Ocean Spray was treated as a beverage company as it primarily offers fruit juices and cocktails, with the only food items sold in Canada being dried cranberries and cranberry sauce, which contain negligible or no sodium, saturated fat, or *trans* fat.

product (re)formulation commitments. Accordingly, a more detailed focus on company commitments regarding product (re)formulation is warranted. This is particularly important given that most products offered by the leading packaged food and beverage companies in Canada and elsewhere are energy dense and high in sodium, saturated fat, and/or sugars (6, 14, 17, 18, 27, 30). Moreover, repeated cross-sectional analyses have shown little or no overall improvement in the nutritional quality of the Canadian packaged food supply over time, suggesting that voluntary product (re)formulation actions and commitments have had limited impact to date (4, 31–33).

The purpose of this study was to develop and apply a tool to quantify the strength of the recent voluntary actions and commitments of major packaged food and beverage companies in Canada to reduce levels of nutrients of public health concern in their products. This novel tool can then be used to facilitate the implementation of BIA-Obesity phase 2, by enabling a comparison of the strength of a company's voluntary (re)formulation commitments to actual changes in the nutritional quality of their products over time (using a branded food database or

food-composition data provided by companies), in relation to WHO- and government-recommended targets.

Methods

Overview of the BIA-Obesity process

Data on the largest Canadian packaged food and nonalcoholic beverage manufacturers' reported actions and commitments concerning product (re)formulation were collected using the BIA-Obesity process, described in detail elsewhere (21). Key steps in the BIA-Obesity process relevant to the present study—including selection of companies, identification of reported actions and commitments, and engagement with company representatives—are summarized in the following sections.

Selection of companies

Table 1 provides a summary of the sampled companies in terms of their Canadian market share, type (i.e., multinational or domestic

manufacturer, retailer), area served, location of head office, and the nature of their products. Twenty-two companies were selected for study based on their Canadian market share for packaged food and/or non-alcoholic beverage sales, with all companies holding $\geq 1\%$ of the market share in 1 or both sectors as of 2016 (34, 35). Companies offering plain bottled water only were excluded ($n = 2$). In combination, the selected companies represented 51.8% of the national market share for packaged foods and 67.8% for (nonalcoholic) beverages as of 2016 (34, 35). When both a subsidiary and its parent company held market shares $\geq 1\%$, assessment of reported actions and commitments was conducted at the level of the parent company, where such information is typically communicated (e.g., Frito-Lay is a subsidiary of PepsiCo). The sample included 12 multinational companies headquartered outside of Canada, 8 Canadian companies or subsidiaries, and 2 national retailers with private-label brands.

Identification of reported actions and commitments concerning product (re)formulation

Publicly available information about companies' recent product (re)formulation actions (i.e., from the previous 5 y) and commitments to future product (re)formulation was collected between January 2017 and January 2018. Only nutrient reductions or commitments implemented as of 31 December 2017 were included in the assessment. Company corporate and brand websites, corporate social responsibility and annual reports, press releases, media articles, and websites or reports of relevant industry initiatives [e.g., the International Food and Beverage Alliance (IFBA), the Canadian Beverage Association's Balance Calories Initiative (BCI)] were searched to identify recently reported actions and commitments concerning product (re)formulation (28, 36). The BCI is a voluntary target set by major Canadian beverage companies to reduce consumption of nonalcoholic beverage calories in Canada by 20% per person between 2015 and 2025 (36). Relevant information was downloaded and archived as pdf files and screenshots of Web pages. Representatives of the sampled companies (e.g., nutritional scientists, dietitians, heads or directors of regulatory affairs) were contacted using e-mail addresses and/or phone numbers identified through internet searches. Introductory e-mails outlining the project and the opportunity to participate in the research process were sent by the research team. Representatives who replied to the initial email and agreed to participate were then sent summaries of the publicly available policy information collected to verify its accuracy and provide additional relevant details ($n = 11$; 50%). For companies that did not participate in the research process (by declining the invitation or not responding), this assessment is based on publicly available information only ($n = 11$; 50%). Ethics approval was received from the University of Toronto Research Ethics Board (protocol number: 00033857).

Development and application of the scoring tool

The Food Company Reformulation (FCR) scoring tool was developed to evaluate the strength of voluntary recent actions (i.e., up to 5 y prior to data collection) and commitments reported by food and beverage companies to reduce energy and/or portion sizes, sodium, saturated fat, and (total, added or free) sugars—and eliminate industrially produced *trans* fats—in their products. “Strength” was defined as the extent to which reported actions and/or commitments satisfied the 5 criteria described below. The FCR tool encompasses selected nutrients and com-

ponents that have been associated with adverse health outcomes, and identified as nutrients of public health concern by the WHO, Health Canada, and others (37, 38). The tool was designed to be a nutrient-based evaluation; non-nutrient-based measures of nutritional quality or components of foods (e.g., artificial flavors or colors, additives, non-nutritive sweeteners, level of processing) were not included in this assessment. The FCR tool was adapted from the BIA-Obesity (21) and the ATNI (39), informed by a review of relevant academic articles (29, 40–45), WHO reports (46–50), and gray literature (51, 52), and tailored to the Canadian context. The tool was developed by the first author (L Vergeer) and refined through feedback from co-authors with extensive experience in private-sector nutrition policy (L Vanderlee, GS, ER, SM, LY, MRL) between September 2019 and February 2020.

The FCR scoring tool includes sections for each nutrient/component of interest (energy/portion sizes, sodium, saturated fat, *trans* fat, and sugars), with separate sets of similar binary indicators for reported recent reductions and commitments. Full details of the FCR scoring tool are provided in **Supplemental Table 1**. Indicators were modeled after the SMART (Specific, Measurable, Attainable, Realistic, Time-sensitive) criteria and assess 1) whether the reduction or commitment is time-bound with baseline and target years (i.e., the years during which the reduction was or will be completed); 2) the breadth of the reduction or commitment across the company's product portfolio (i.e., whether all relevant products are included, or whether only certain brands or food categories are included and specified); 3) the achieved or targeted magnitude of reduction and its measurability (e.g., stated with a denominator, such as per serving size or a given amount, or as a percentage), meaningfulness, and significance in relation to recommendations or product (re)formulation targets established by governments [e.g., Health Canada's voluntary sodium-reduction targets established in 2012 (51)] or the WHO (37, 38); 4) whether the reduction or commitment is stated to be applied consistently in the country of interest and in all markets in which the company operates; and 5) the transparency of the reduction or commitment in terms of the public availability and accessibility of relevant information and regular (e.g., annual or biannual) publication of product (re)formulation progress. The FCR tool also includes a set of more general (“additional”) indicators related to the company's support of government- or WHO-endorsed recommendations for product (re)formulation, their participation in industry initiatives concerning product (re)formulation (e.g., the IFBA), and their use of government-endorsed NP models to guide product (re)formulation improvement efforts. Companies score higher if they report both recent actions and commitments to reduce multiple nutrients of concern in their products (where relevant) that are time-bound, applicable to their entire product portfolio, stated in terms of measurable magnitudes of reduction that align with public health recommendations (where applicable; e.g., Health Canada's sodium-reduction targets), applied consistently in all markets in which the country operates (including the country of interest), and publicly reported on a regular basis.

With regard to particular nutrients, companies with product portfolios solely or primarily consisting of beverages (A. Lassonde, Canada Dry Mott's, Coca-Cola, and Ocean Spray Cranberries; hereafter referred to as “beverage companies”) were only assessed in terms of reported actions or commitments concerning energy/portion sizes and sugars as they are likely to have negligible amounts of sodium, saturated fats, or *trans* fats in their products. Scores for individual nutrients/components

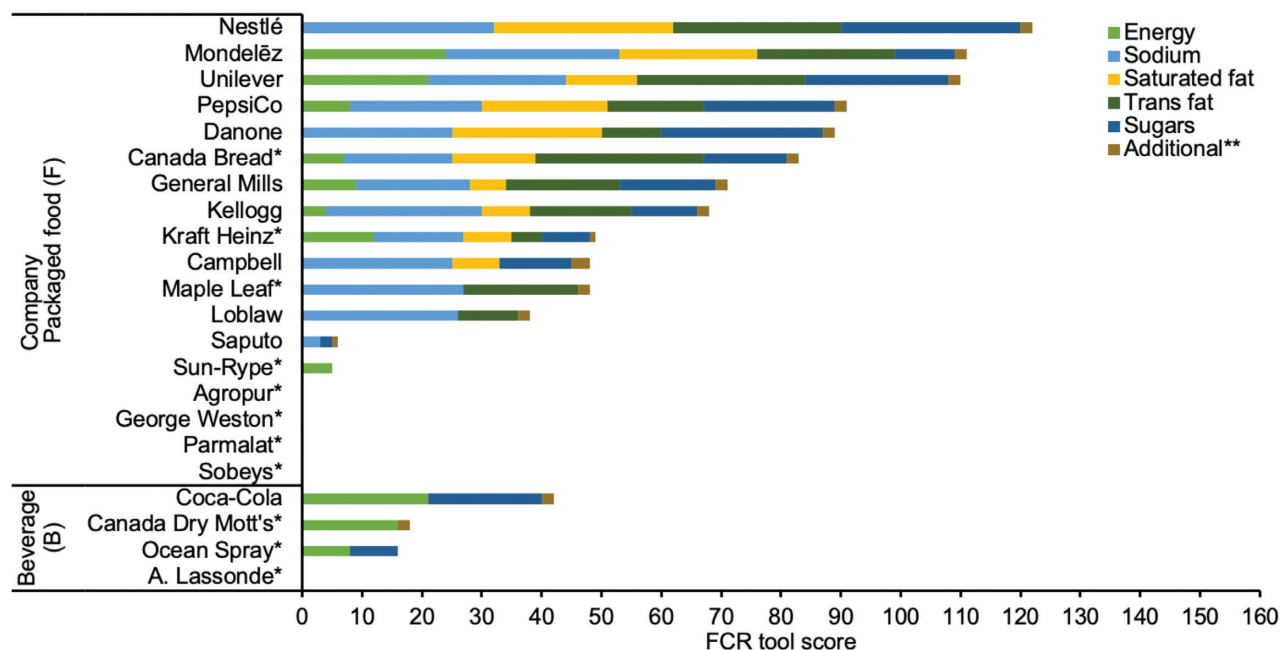


FIGURE 1 Overall scores of the 22 largest packaged food (F) and beverage (B) companies in Canada based on the FCR scoring tool for assessing food company-reported recent actions and commitments concerning reductions in the energy/portion size and levels of sodium, saturated fat, *trans* fat, and sugars in their products. (F) Company offers packaged food only or foods plus beverages (score out of 155). (B) Company only or primarily offers beverages [score out of 65; sodium, saturated fat, and *trans* fat (re)formulation not applicable]. *Score based on publicly available information only since company chose not to participate in the research process. Scores for all companies are based on recent actions and commitments concerning product (re)formulation reported as of 31 December 2017. **Additional indicators assess the company's support of government or public health organization recommendations or targets concerning product (re)formulation, use of government-endorsed nutrient profile models, and commitments to increase the overall healthfulness of their product portfolio. FCR, Food Company Reformulation.

and the additional indicators were combined to derive a total score out of 155 for companies offering packaged food only or food and beverages (hereafter referred to as “packaged food companies”) and 65 for beverage companies.

Data analyses

Scoring for all companies was completed independently by L Vergeer and CM, and interrater reliability was calculated using Gwet's AC1 (unweighted) statistic. Discrepancies in scores were discussed and a final score was agreed upon. Descriptive analyses examined median scores and ranges (total and by nutrient/component) and the number and proportion of companies that reported recent reductions and/or commitments: 1) concerning energy/portion sizes, sodium, saturated fat, *trans* fat, and/or sugars and 2) satisfying each criterion of the FCR tool (e.g., baseline year, target year, applicable to entire product portfolio, publicly available). Components of companies' reported reductions and commitments that were not captured by the FCR tool (e.g., specified magnitudes of reduction, number of brands or food categories included, percentage of total sales consisting of reformulated products) were summarized qualitatively.

Mann-Whitney *U* tests compared differences in total scores (expressed as a percentage of 155 for packaged food companies and 65 for beverage companies) between companies that engaged ($n = 11$) and did not engage ($n = 11$) in the BIA-Obesity Canada research pro-

cess, and between multinational companies headquartered outside of Canada ($n = 12$) versus domestic companies (i.e., multinationals based in Canada, manufacturers and retailers only operating in Canada, Canadian subsidiaries; $n = 10$). Associations between a company's total FCR score and their market share for packaged food and/or beverage sales were assessed using Spearman's rank correlation coefficient. *P* values <0.05 were considered statistically significant. Analyses were conducted using RStudio (version 1.2.5019; RStudio, Inc.).

Results

Results are reported separately for packaged food companies and beverage companies to help account for differences in the nature of their product portfolios.

Total scores based on the FCR tool

Scores based on the FCR tool are presented by company in **Figure 1**. Gwet's AC1 interrater reliability coefficient was 0.88 (95% CI: 0.87, 0.89). Seventeen of the 22 companies (77.3%) reported recent actions and/or commitments to reduce levels of ≥ 1 nutrient(s)/component(s) of concern in their product portfolios. No reported reductions or commitments were identified for 5 companies (22.7%): A. Lassonde, Agropur, George Weston, Parmalat, and Sobeys.

Total scores ranged from 0 to 122 for packaged food companies (out of 155), with a median score of 49. Nestlé scored highest and Agropur, George Weston, Parmalat, and Sobeys received scores of 0. For beverage companies, scores ranged from 0 to 42 (out of 65), with Coca-Cola achieving the highest score, A. Lassonde scoring 0, and a median score of 17 among the 4 companies.

Total FCR scores were significantly higher for companies that participated in the BIA-Obesity Canada research process (median = 57.4% of 155 for packaged food companies or 65 for beverage companies) than companies that did not participate (median = 3.2%; $P = 0.003$). Multi-national companies (median = 51.6%) had significantly higher total scores than domestic companies (median = 3.5%; $P = 0.004$). There was no significant association between FCR total scores and packaged food market shares ($P = 0.50$). Beverage market shares were, however, positively associated with FCR total scores ($r_s = 0.69$, $P = 0.04$).

Product (re)formulation actions and commitments by nutrient/component

Table 2 shows the proportion of companies that reported recent actions and/or commitments concerning targets for each nutrient/component. FCR tool nutrient/component subscores are also presented in Table 2 as totals and separately by reported recent actions and commitments.

Prevalence of reported actions and/or commitments concerning each nutrient/component.

Sodium was the most commonly targeted nutrient for reformulation efforts by the 18 packaged food companies, as 72.2% ($n = 13$) reported recent reductions ($n = 12$; 66.7%) and/or commitments ($n = 13$; 72.2%; Table 2). Eleven of these 18 companies (61.1%) had recently eliminated ($n = 9$; 50.0%) and/or committed to eliminate ($n = 10$; 55.6%) industrially produced *trans* fats from some or all of their products. Among the total sample, sugars (re)formulation was prevalent, with 13 of the 22 packaged food and beverage companies (59.1%) reporting recent reductions ($n = 11$; 50.0%) and/or commitments to reduce ($n = 10$; 45.5%) sugars in their products. Ten of the 18 packaged food companies (55.6%) reported recent actions ($n = 7$; 38.9%) and/or commitments ($n = 8$; 44.4%) to reduce saturated fat. Last, 11 of the 22 packaged food and beverage companies (50.0%) described recent actions ($n = 11$; 50.0%) and/or commitments ($n = 5$; 22.7%) to reduce the energy content or portion sizes of their products. Of these 11 companies, 8 (72.7%) reported actions or commitments to offer products in smaller portion or package sizes as opposed to reductions in energy density.

FCR tool scores by nutrient/component.

Scores were highest for sodium reductions and commitments (median = 21/32; range = 0–32), followed by actions or commitments pertaining to *trans* fat (median = 10/28; range = 0–28; Table 2). Companies that received perfect scores for sodium (Nestlé) and *trans* fat (Canada Bread, Nestlé, and Unilever) reported recent SMART actions and commitments to reduce sodium and/or eliminate *trans* fat across their entire global product portfolios. Nestlé was 1 of 5 companies to report efforts to meet Health Canada's voluntary sodium-reduction targets (in addition to Loblaw, Maple Leaf Foods, Saputo, and Unilever). Companies received lower scores overall for the remaining nutrients/components: sugars (median = 8/30; range = 0–30), satu-

rated fat (median = 7/30; range = 0–30), and energy or portion sizes (median = 2/30; range = 0–24). Scores were also low for the additional indicators (median = 2; range = 0–3). Twelve companies publicly supported product (re)formulation recommendations or initiatives of Health Canada and/or the WHO, and 11 companies were signatories to national or global initiatives on product (re)formulation, such as the IFBA and/or the BCI. Only 1 company (Campbell Soup) mentioned using the Australian government-endorsed Health Star Rating (HSR) front-of-pack labeling system (53) to classify the healthfulness of products for the purposes of product reformulation or development.

Analysis of companies' recent actions and commitments by FCR criterion for each nutrient/component

A breakdown of the number and proportion of companies that satisfied each criterion of the FCR scoring tool—in terms of baseline and target years, breadth across the product portfolio, targeted or achieved magnitude of reduction, national- or global-level applicability, and transparency—is shown in Table 3, presented by nutrient/component and whether companies reported recent actions or commitments. Overall, most companies publicly reported their recent product (re)formulation actions or commitments. However, few companies applied their nutrient targets to their entire (relevant) product portfolio, with most companies targeting commitments to ≤ 3 food categories or brands or neglecting to specify which products were included (e.g., reporting a sodium reduction in unspecified “key” brands). Three companies specified the percentage of sales from reformulated products, all of which were $< 13\%$ of total sales. There was large variation between companies in terms of the percentage of products included in a nutrient/energy target, with the percentage of reformulated products ranging from $\sim 30\%$ to 100% of companies' product portfolios, but often only within certain food categories or brands (rather than all relevant products). The number of products reduced in a given nutrient or energy/portion size ranged from < 100 to > 1000 products.

Targeted or achieved magnitudes of reduction for a particular nutrient/component also varied widely, with percentage reductions ranging from an $\sim 1.4\%$ to 30% reduction. Eight companies specified targets in relation to their own nutrition criteria or NP models. For example, Nestlé committed to reduce sodium and saturated-fat contents by an average of at least 10% in all products that are not yet aligned with the Nestlé Nutritional Profiling System by 2020 (54–56). Similarly, Danone committed that all products will meet their nutritional targets for sodium, saturated fat, and sugars by 2020, with 86%, 98%, and 77% of products having already met these targets by 2017, respectively (57, 58). Fewer companies established targets for the magnitude of reduction in the context of daily nutrient intakes [e.g., Unilever stated that, by 2020, 75% of their “Foods” portfolio will enable daily sodium intakes of ≤ 5 g (59)], and others stated their reductions as absolute amounts without denominators [e.g., the retailer Loblaw declared that 251,073 kg sodium had been removed from 1027 of their products as of 2015 (60)].

Discussion

Importance of findings in the context of existing literature

This study provides a comprehensive evaluation of the strength of voluntary recent actions and commitments reported by the largest

TABLE 2 FCR tool scores of voluntary actions reported by the largest packaged food and beverage companies in Canada (n = 22) to reduce the energy (or portion sizes), sodium, saturated fat, trans fat, and/or sugars content of their product portfolios, presented in terms of recent actions (A), commitments to improving product (re)formulation (C), and total scores for each nutrient (T)¹

Company	Energy/portion size			Sodium			Saturated fat			trans Fat			Sugars			Additional indicators ⁵ (/5)	Total score (raw, %)/155 for food companies, /65 for beverage companies ⁶
	A ² (/15)	C ³ (/15)	T ⁴ (/30)	A ² (/16)	C ³ (/16)	T ⁴ (/32)	A ² (/15)	C ³ (/15)	T ⁴ (/30)	A ² (/14)	C ³ (/14)	T ⁴ (/28)	A ² (/15)	C ³ (/15)	T ⁴ (/30)		
Packaged food ⁷																	
Agropur ⁸	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (0.0%)	
Campbell Soup	0	0	0	12	13	25	8	0	8	0	0	0	6	6	12	48 (31.0%)	
Canada Bread ⁸	7	0	7	9	9	18	9	5	14	14	28	7	7	14	2	83 (53.5%)	
Danone	0	0	0	11	14	25	11	14	25	0	10	10	13	14	27	89 (57.4%)	
General Mills	9	0	9	12	7	19	0	6	6	6	19	10	10	6	16	71 (45.8%)	
George Weston ⁸	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (0.0%)	
Kellogg	4	0	4	13	13	26	0	8	8	7	10	17	11	0	11	68 (43.9%)	
Kraft Heinz ⁸	4	8	12	8	7	15	0	8	8	0	5	5	0	8	8	49 (31.6%)	
Loblaws	0	0	0	13	13	26	0	0	0	0	10	0	0	0	0	38 (24.5%)	
Maple Leaf Foods ⁸	0	0	0	13	14	27	0	0	0	0	9	19	0	0	2	48 (31.0%)	
Mondelēz	13	11	24	15	14	29	14	9	23	9	14	23	10	0	10	111 (71.6%)	
Nestlé	0	0	0	16	16	32	15	15	30	14	14	28	15	15	30	122 (78.7%)	
Parmalat ⁸	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (0.0%)	
PepsiCo	8	0	8	11	11	22	10	11	21	6	10	16	11	11	22	91 (58.7%)	
Saputo	0	0	0	0	0	3	0	0	0	0	0	0	0	2	2	6 (3.9%)	
Sobeys ⁸	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (0.0%)	
Sun-Rype ⁸	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5 (3.2%)	
Unilever	11	10	21	13	10	23	12	0	12	14	14	28	13	11	24	110 (71.0%)	
Beverage⁹																	
A. Lassonde ⁸	0	0	0	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	0	0	0	0 (0.0%)	
Canada Dry Mott's ⁸	6	10	16	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	0	0	2	18 (27.7%)	
Coca-Cola	12	9	21	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	11	8	19	2	42 (64.6%)	
Ocean Spray ⁸	8	0	8	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	N/A ⁸	8	0	0	16 (24.6%)	
Median score	2	0	2	11	10	21	0	7	7	3	7	10	3	0	8	49/155, 17/65	
No. of companies ¹⁰	11	5	11	12	13	13	7	8	10	9	10	11	11	10	13	15	
Percentage ¹¹	50.0	22.7	50.0	66.7	72.2	72.2	38.9	44.4	55.6	50.0	55.6	61.1	50.0	45.5	59.1	68.2	

¹Based on recent actions and commitments implemented and reported as of 31 December 2017. FCR, Food Company Reformulation; N/A, not applicable.
²FCR tool score for recent actions to reduce the energy content, portion sizes, or nutrient amounts in the company's products (maximum possible score listed in parentheses).
³FCR tool score for commitment(s) to reduce the energy content, portion sizes, or nutrient amounts in the company's products (maximum possible score listed in parentheses).
⁴Total FCR tool score for the nutrient/component of interest (maximum possible score listed in parentheses).
⁵Additional indicators concerning company's support of government or public health organization recommendations or targets concerning product (re)formulation, use of government-endorsed nutrient profile models, and commitments to increase the overall healthfulness of product portfolio (maximum possible score listed in parentheses).
⁶Total FCR tool score including all relevant nutrients/components and the additional indicators, presented as the raw score followed by the percentage score (out of 155 for packaged food companies and out of 65 for beverage companies) in parentheses.
⁷Company offers packaged foods only or foods plus beverages.
⁸Scores based on publicly available information only, as company chose not to participate in the research process.
⁹Company offers beverages only (information and commitments concerning sodium, saturated fat, and trans fat are not applicable).
¹⁰The number of companies with a reported recent action and/or commitment concerning the nutrient/component of interest.
¹¹The percentage of companies with a reported recent action and/or commitment concerning the nutrient/component of interest, with a denominator of 22 packaged food and beverage companies for energy/portion sizes, sugars, the additional indicators, and the total score, and a denominator of 18 packaged food companies for sodium, saturated fat, and trans fat.

TABLE 3 The number and proportion of top packaged food and beverage companies in Canada with reported recent actions (A) and/or commitments (C) concerning reductions in energy (or portion sizes), sodium, saturated fat, *trans* fat, and/or sugars with specific information concerning baseline and target years, breadth across their product portfolio, targeted magnitudes of reduction, national and global applicability, and transparency

Criterion	Energy/portion sizes, n (%)		Sodium, n (%)		Saturated fat, n (%)		<i>trans</i> Fat, n (%)		Sugars, n (%)	
	A ¹	C ²	A ¹	C ²	A ¹	C ²	A ¹	C ²	A ¹	C ²
Time-bound										
Baseline year ³	3 (27.3)	5 (100.0)	10 (83.3)	10 (76.9)	3 (42.9)	6 (75.0)	5 (55.6)	8 (80.0)	9 (81.8)	8 (80.0)
Target year ⁴	7 (63.6)	4 (80.0)	12 (100.0)	7 (53.8)	7 (100.0)	5 (62.5)	8 (88.9)	9 (90.0)	10 (90.9)	7 (70.0)
Breadth										
All products ⁵	0 (0.0)	0 (0.0)	2 (16.7)	6 (46.2)	2 (28.6)	2 (25.0)	3 (33.3)	4 (40.0)	1 (9.1)	2 (20.0)
Brands or food categories ⁶	8 (72.7)	4 (80.0)	10 (83.3)	8 (61.5)	3 (42.9)	4 (50.0)	7 (77.8)	5 (50.0)	9 (81.8)	4 (40.0)
Sales volume (% of sales) ⁷	1 (9.1)	1 (20.0)	5 (41.7)	7 (53.8)	5 (71.4)	2 (25.0)	3 (33.3)	4 (40.0)	4 (36.4)	2 (20.0)
No. (%) of products ⁸	7 (63.6)	2 (40.0)	10 (83.3)	11 (84.6)	6 (85.7)	5 (62.5)	8 (88.9)	5 (50.0)	7 (63.6)	7 (70.0)
Magnitude of reduction										
Specified magnitude ⁹	7 (63.6)	4 (80.0)	12 (100.0)	11 (84.6)	6 (85.7)	7 (87.5)	N/A ¹⁰	N/A ¹⁰	10 (90.9)	6 (60.0)
Measurable/meaningful ¹¹	7 (63.6)	4 (80.0)	10 (83.3)	10 (76.9)	5 (71.4)	7 (87.5)	N/A ¹⁰	N/A ¹⁰	9 (81.8)	6 (60.0)
National targets ¹²	N/A ¹³	N/A ¹³	4 (33.3)	5 (38.4)	N/A ¹³	N/A ¹³	5 (55.6)	10 (100.0)	N/A ¹³	N/A ¹³
Global recommendations ¹⁴	N/A ¹³	N/A ¹³	8 (66.7)	8 (61.5)	4 (57.1)	3 (37.5)	4 (44.4)	8 (80.0)	5 (45.5)	5 (50.0)
Applicability										
Applicable to Canada ¹⁵	6 (54.5)	5 (100.0)	10 (83.3)	11 (84.6)	7 (100.0)	6 (75.0)	9 (100.0)	10 (100.0)	7 (63.6)	8 (80.0)
Globally applicable ¹⁶	3 (27.3)	3 (60.0)	8 (66.7)	10 (76.9)	5 (71.4)	6 (75.0)	8 (88.9)	9 (90.0)	6 (54.5)	6 (60.0)
Transparency										
Publicly available ¹⁷	11 (100.0)	5 (100.0)	12 (100.0)	12 (92.3)	7 (100.0)	7 (87.5)	9 (100.0)	10 (100.0)	11 (100.0)	9 (90.0)
Consolidated, accessible ¹⁸	10 (90.9)	5 (100.0)	10 (83.3)	11 (84.6)	5 (71.4)	7 (87.5)	8 (88.9)	10 (100.0)	7 (63.6)	7 (70.0)
Regular progress reporting ¹⁹	5 (45.5)	0 (0.0)	11 (91.7)	3 (23.1)	7 (100.0)	1 (12.5)	7 (77.8)	8 (80.0)	9 (81.8)	1 (10.0)

¹A: Reported recent actions to reduce the nutrient/component of interest (implemented as of 31 December 2017). Denominator of percentages is the number of companies with reported recent actions concerning that nutrient/component (Table 2).

²C: Reported commitment to reduce nutrient or component of interest (implemented as of 31 December 2017). Denominator of percentages is the number of companies with reported commitments concerning that nutrient/component (Table 2).

³Year from which the reduction was made or will be made.

⁴Year by which the reduction was made or will be made.

⁵Reduction or commitment applies to the company's entire product portfolio.

⁶Reduction or commitment applies to certain specified brands, product lines, and/or food categories (includes companies that stated that all products in their portfolio were included).

⁷Company states percentage of total sales or sales volume included in reduction or commitment (includes companies that stated that all products in their portfolio were included).

⁸Company discloses number or percentage of reformulated products that were or will be launched (includes companies that stated that all products in their portfolio were included).

⁹Company specifies achieved or targeted magnitude of reduction.

¹⁰Specific targeted magnitude(s) of reduction not applicable (N/A) in the context of an elimination of industrially produced *trans* fats.

¹¹Achieved or targeted magnitude of reduction is stated in a measurable and meaningful way (i.e., with a denominator, such as a percentage or per serving).

¹²Achieved or targeted magnitude of reduction is stated to be consistent with national voluntary nutrient targets, if applicable (e.g., Health Canada's sodium-reduction targets).

¹³No Canadian government or WHO recommendations or (re)formulation targets existed for that nutrient/component at the time of the study; indicator was not applicable (N/A).

¹⁴Company makes reference to recommendations of global public health organizations (e.g., WHO) in the context of their reported nutrient reduction or commitment.

¹⁵Company specifies national applicability of reduction or commitment.

¹⁶Company specifies that reduction or commitment is applied consistently in all markets in which the company operates.

¹⁷Reduction or commitment is publicly available.

¹⁸Reduction or commitment is easy to locate from publicly available sources and is presented in a consolidated form.

¹⁹Company has publicly reported their product (re)formulation progress on a regular basis or commits to future regular reporting (e.g., annual or biannual).

packaged food and beverage companies in Canada to reduce the energy density and nutrients of public health concern in their products. Consistent with previous studies (17, 23, 40, 61), sodium and *trans* fat were nutrients commonly targeted by product (re)formulation initiatives. However, most companies' product (re)formulation actions and commitments scored relatively low according to the FCR tool, with median total scores of 49/155 (31.3%) and 17/65 (26.2%) for packaged food and beverage companies, respectively. These results indicate that, while several major packaged food and beverage companies in Canada report

recent actions and/or commitments to voluntarily improve the nutritional quality of their products, most are unlikely to substantially improve the healthfulness of the food supply in their current form.

Importantly, most companies did not report critical information for evaluating their product (re)formulation progress, such as a baseline and/or target year, a measurable magnitude of reduction (e.g., expressed as a percentage or per serving size), which food categories or brands were covered, and what national markets and percentage of total sales were (or would be) affected by the product (re)formulation action

or commitment. Among companies that did disclose this information, their nutrient reductions or commitments were often limited in scope, applicable to few food categories or brands, implemented inconsistently across different markets, and represented a relatively small percentage of the company's total sales. Most companies also did not indicate whether their targeted magnitude of reduction for a nutrient was meaningful in the context of public health recommendations. While 8 of the sampled companies have established their own nutrition criteria or NP models that they use to define the healthfulness of a product for the purpose of reformulation, few of these systems have demonstrated alignment with global recommendations or been formally validated or documented in peer-reviewed literature (17, 62). Our findings therefore suggest that, if voluntary measures are likely to be effective (assuming that companies will abide by them), there is a need for more widespread implementation of specific, measurable, comprehensive, and time-bound product (re)formulation targets that clearly align with public health recommendations.

The higher FCR scores attained by certain companies in this sample demonstrate the potential for a greater number of manufacturers to implement stronger product (re)formulation targets. Nestlé, Mondelez, and Unilever were the top-scoring companies based on the FCR scoring tool, results that strongly align with the BIA-Obesity (specifically, the product formulation domain) applied to this same sample of Canadian packaged food and beverage companies (22). They were also among the best-performing companies in the product formulation domain of the BIA-Obesity evaluation in Australia and New Zealand (23, 61) and the ATNI Global Index 2018 (17). These companies have established specific commitments to reduce multiple nutrients of public health concern across their entire relevant global product portfolios. Their targets have been modified over time to reflect their product (re)formulation progress, which is publicly communicated on a regular basis, and their nutrient reductions and commitments reportedly align with recommendations of the WHO and/or Health Canada. Notably, these companies reported both recently achieved reductions and ongoing commitments to reduce nutrients of concern in their products, which is critical in ensuring that companies continue to improve the nutritional quality of their product portfolios. Nonetheless, no company achieved >79% of the highest possible FCR tool total score, indicating that there is room for improvement among all companies included in this assessment.

Consistent with previous research (17, 23, 24), this study found that companies that actively participated in the research process scored better, on average, than companies that were assessed solely on publicly available information. Nearly all of the companies that participated were multinational, with the exception of 1 Canadian retailer (Loblaw), which may be a reflection of having greater resources, including employees with nutritional science or public health backgrounds and responsibilities related to nutrition policy. Multinational companies reformulating products in other national markets in response to government policies or industry initiatives may also be more likely to apply these product (re)formulation targets to their Canadian products. This is supported by our finding that multinational companies (headquartered outside of Canada) had higher FCR scores, on average, than Canadian companies. Nonetheless, given that several Canadian grocery retailers and manufacturers hold relatively large market shares in Canada's packaged food and beverage sectors, it will be important to engage these

companies in national industry and government reformulation initiatives (63).

Previous research demonstrated that many of the Canadian products offered by the packaged food and beverage companies in this sample are of relatively poor nutritional quality, with mean HSRs of <3.5/5 (i.e., generally considered less healthy) and two-thirds of their products exceeding 15% of the Daily Value and considered high in sodium, saturated fat, and/or sugars (6). There was also significant variation in the nutritional quality of comparable products offered by different companies (6). Similar results were observed in a 2016 cross-sectional analysis of calories and nutrients of concern in the menu items of major Canadian chain restaurants (64). Combined with the results of the present study, this research reinforces a need for establishing SMART product (re)formulation targets across the packaged food and beverage industries. However, while companies are less likely to improve the healthfulness of their product portfolios without the prior establishment of explicit policies and commitments (21), such commitments may not necessarily translate into having healthier products. Future research should examine whether reporting stronger product (re)formulation commitments is associated with greater improvements in the nutritional quality of companies' products over time.

Government and WHO product (re)formulation policies and recommendations

The WHO recommends that food companies eliminate industrially produced *trans* fats and reduce levels of saturated fat, free sugars, and salt in their products, with a targeted 30% reduction in global salt intake by 2025 (46). There are, however, no international targets for saturated fat and sugars (re)formulation. It may also be challenging for companies to adopt the WHO salt targets, which are based on intakes rather than the sodium content of foods. In Canada, the federal government established voluntary sodium reduction targets for the food industry in 2012 based on dietary intakes of sodium, with phased targets specific to different food categories containing significant amounts of sodium (51). By 2017, there had been no meaningful change in average sodium contents in 48% of the food categories assessed, and targets were only met in 14% of food categories (65). Although sodium was the most commonly targeted nutrient for (re)formulation by packaged food companies in this sample, only 5 companies made reference to Health Canada's sodium-reduction targets. This may be at least in part due to the fact that 12 of the 22 companies were multinationals headquartered outside of Canada, with most of their product (re)formulation efforts targeted at their entire global portfolio and/or with no explicit reference to the Canadian market. In Canada, companies should therefore implement comprehensive SMART targets for sodium reduction that align with Health Canada's voluntary sodium-reduction targets.

Given the lack of strong industry commitment to meaningful product (re)formulation strategies, mandatory policies will likely be required in order to actualize significant changes in the nutritional quality of the food supply (66). Health Canada's ban on partially hydrogenated oils (PHOs) in packaged and restaurant foods implemented in September 2018 is 1 example of a mandatory product (re)formulation intervention that will reduce *trans* fat intakes in Canada (67). As of 2019, 28 countries had mandatory *trans* fat limits in effect, with 12 countries (including Canada) enacting national bans on the use of PHOs in all foods or establishing mandatory limits of ≤ 2 g of industrially produced *trans* fat per

100 g of total fats and oils in all foods (68). Despite global efforts to reduce *trans* fat in food supplies (68), a lack of coordinated government interventions will still require voluntary industry commitments in countries where mandatory *trans* fat policies have not been implemented. This study indicates that at least 3 major packaged food manufacturers in Canada (Canada Bread, Nestlé, and Unilever) have eliminated *trans* fat from their entire global product portfolios, and 7 other companies have committed to eliminating it from their portfolios in the future.

Many food companies in Canada and elsewhere actively attempt to influence public health nutrition policy (69–71). For example, an analysis of the food industry's responses to a 2014 US government consultation on product (re)formulation found that companies commonly emphasized the costs and challenges involved in reformulation and argued for voluntary (rather than mandatory) governance of product (re)formulation policies (70). The present study demonstrates that some leading packaged food and beverage companies in Canada have established relatively strong commitments to reducing amounts of negative nutrients/components in their product portfolios, suggesting that, although reformulation may present challenges and additional costs, it is feasible for many major manufacturers. However, many of the sampled companies' product (re)formulation commitments or actions failed to span all relevant products and national markets, and targeted insignificant or immeasurable magnitudes of reduction. Such product (re)formulation policies may more likely be an attempt to “whitewash” the reputations of companies and their brands (72) and used as a strategy to preclude the implementation of mandatory nutrient-reduction targets, rather than help improve the healthfulness of the food supply and the diet quality of consumers.

Strengths, limitations, and future directions

While there is no “gold standard” framework against which to validate the FCR scoring tool, the tool was developed based on government and WHO recommendations (40–46), peer-reviewed literature (10, 20, 34–39), and consultation with several academic experts in private-sector nutrition policy, establishing content validity of the tool. Moreover, it was adapted from the BIA-Obesity and ATNI tools, which were derived through extensive stakeholder consultations and have been applied to numerous food and beverage companies and national markets (17, 18, 22, 23, 61). The high interrater reliability observed in the application of the FCR scoring tool indicates that it can be applied consistently. Importantly, the FCR tool demonstrated a wide range in scores in the area of product (re)formulation actions and commitments specific to each nutrient/component examined. It effectively distinguished between companies' reported actions and commitments based on their specificity, comprehensiveness, national- and global-level applicability, transparency, and meaningfulness in the context of public health. Compared with BIA-Obesity, the FCR tool evaluated this information for each individual nutrient/component, which is important given that product (re)formulation efforts may not be directed at all nutrients equally and reducing levels of some negative nutrients may not be applicable to certain types of product portfolios (e.g., sodium and beverages). The FCR tool also evaluates recent actions and ongoing commitments separately, highlighting the importance of continually setting new independently developed, food category-specific nutrient targets until all relevant products have been reduced to the lowest level possible for that nutrient. Consequently, some companies' scores ranked differently be-

tween the FCR and BIA-Obesity (product formulation domain) tools. Implementation of the FCR tool in other countries, particularly alongside BIA-Obesity phases 1 and 2, will be useful in benchmarking, monitoring, and quantifying the strength of food and beverage companies' reported actions and commitments to improve the nutritional quality of their products. Assessing companies with concrete measurable indicators may facilitate identification and prioritization of actions to improve the quality and meaningfulness of their product (re)formulation actions and commitments, while simultaneously enabling effective monitoring of each company's performance in this area. This study indicates that the FCR tool may be an appropriate means of monitoring progress in food and beverage companies' product (re)formulation reported actions and commitments over time.

Although the FCR scoring tool addresses sales-weighting of companies' product (re)formulation reported actions and commitments, this assessment is limited and does not penalize companies that set targets representing a low sales volume or an insignificant proportion of their total sales. Only 3 companies mentioned sales in the context of their product (re)formulation actions and commitments, all of which represented <13% of their total sales. A company may emphasize their efforts to reformulate products that constitute a small fraction of their total sales, while neglecting to improve the nutritional composition of their more popular foods and beverages. Conversely, if a company's sales are largely derived from healthier alternatives (e.g., low-sugar beverages, such as artificially sweetened drinks or bottled water), weighting their product (re)formulation targets by sales may divert attention away from products where reformulation is needed (e.g., sugary drinks). It is therefore important that food and beverage companies account for sales-weighting in developing and reporting on product (re)formulation targets.

While establishing strong product (re)formulation targets is important, independent auditing of companies' progress in meeting these targets is equally critical (43). The FCR tool evaluates whether companies publicly report their product (re)formulation progress on a regular basis, but it does not assess their accountability or compliance. Food and beverage companies and industry initiatives, such as the IFBA and the BCI, often appoint their own auditors (28, 36); however, conflicts of interest may arise if companies are paying their own audit fees. Regular independent auditing has therefore been recommended as a means of holding companies accountable for their performance in addressing unhealthy food supplies and food environments (43). An accountability framework has been proposed to monitor food industry and government actions in this area, including sanctions for noncompliance (73). Future evaluations using the FCR scoring tool or other food-supply-monitoring frameworks should consider assessing how a company's compliance with product (re)formulation commitments is audited. Nonetheless, without government oversight, there is no mechanism of enforcing these targets (43). There is therefore a need to explore other possible incentives for companies to meet their product (re)formulation targets.

The FCR scoring tool has some additional limitations. First, the tool is nutrient-focused and does not incorporate other important measures or indicators of the healthfulness of foods, as defined by national dietary guidelines in Canada and other countries (e.g., level of processing and use of highly processed ingredients, and contents of fruits, vegetables, whole grains, or plant-based proteins) (74). Moreover, this assessment

does not consider the frequencies and amounts in which different types of products are typically consumed, as reformulation of foods with relatively low contributions to population nutrient intakes may have less impact on the diet quality of consumers than highly consumed products. The FCR tool also has limited capacity to account for key differences in the nature of product portfolios of different companies that may affect their potential for reformulation. For example, bread requires a certain amount of salt to stabilize yeast fermentation, while meat products necessitate minimum levels of salt for preservation and microbiological safety (75). When reducing the density of a nutrient is not feasible, companies can consider increasing their offering of single-serving products in smaller portion sizes, substituting less healthy products in their product portfolio with healthier alternatives (e.g., more plain or flavored waters and fewer sugary drinks) or highlighting excessive amounts of nutrients of public health concern in their products through interpretive front-of-package (FOP) labels. In addition, the FCR tool is unable to account for baseline differences in the nutritional quality of companies' products, influencing the extent to which improvements may be needed in the healthfulness of a company's product portfolio. This study is also limited by its inclusion of policies or actions reported as of 31 December 2017; some companies may have taken significant action or implemented stronger commitments concerning product (re)formulation since the time of data collection. While this study is strengthened by its engagement with food and beverage company representatives to verify and supplement data collected from public sources, only half of the sampled companies opted to participate in the BIA-Obesity Canada research process. Relevant information incorporated in unpublished documents would not have been captured for companies that did not disclose it to the research team. Finally, this study did not examine how voluntary commitments relate to actual changes in the nutritional quality of companies' product portfolios, including whether any changes were due to reformulation, new product development, acquiring product lines, or selling off product lines to other companies. There is a need for future studies to investigate such changes in relation to companies' FCR tool scores.

Conclusions

While most of the top packaged food and beverage companies in Canada report recent actions and/or commitments to improve the nutritional quality of their products, there is considerable room for improvement in the specificity, comprehensiveness, significance, measurability, national-level applicability, and transparency of their product (re)formulation activities. Companies should implement comprehensive product (re)formulation commitments across their product portfolios, with SMART targets for sodium, saturated fat, sugars, and energy/portion sizes and complete elimination of industrially produced *trans* fats (where relevant) and public reporting of their progress in achieving these targets on a regular basis. The FCR scoring tool described and applied in this study may facilitate the development of product (re)formulation targets that meet the SMART criteria and can be used to quantify the strength of food and beverage companies' product (re)formulation reported actions and commitments. The FCR tool also enables benchmarking and monitoring of companies' product (re)formulation progress over time. Future research is needed to independently compare FCR tool scores with actual changes in the nutritional quality of products offered by these companies in Canada. In

the absence of increased voluntary efforts by the industry to improve the nutritional quality of their products, government intervention to establish mandatory limits on nutrients of public health concern with accountability mechanisms, or the introduction of regulations such as mandatory FOP labeling, which are being implemented in a growing number of countries (76), is likely warranted.

Acknowledgments

The authors' responsibilities were as follows—L Vergeer, L Vanderlee, GS, ER, SM, LY, and MRL: contributed to the development of the Food Company Reformulation (FCR) scoring tool; L Vergeer, L Vanderlee, and MRL: collected data; L Vergeer and CM: applied the FCR scoring tool to the data; L Vergeer: analyzed data and drafted the manuscript; L Vanderlee, GS, ER, SM, LY, CM, and MRL: assisted in editing the manuscript; MRL: had primary responsibility for final content; and all authors: read and approved the final manuscript.

References

1. GBD 2017 Diet Collaborators. Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 2019;393(10184):1958–72.
2. Swinburn B, Sacks G, Vandevijvere S, Kumanyika S, Lobstein T, Neal B, Barquera S, Friel S, Hawkes C, Kelly B, et al. INFORMAS (International Network for Food and Obesity/non-communicable diseases Research, Monitoring and Action Support): overview and key principles. *Obes Rev* 2013;14(Suppl 1):1–12.
3. Vergeer L, Veira P, Bernstein JT, Weippert M, L'Abbé MR. The calorie and nutrient density of more- versus less-processed packaged food and beverage products in the Canadian food supply. *Nutrients* 2019;11(11):2782.
4. Arcand J, Jefferson K, Schermer A, Shah F, Trang S, Kutlesa D, Lou W, L'Abbe MR. Examination of food industry progress in reducing the sodium content of packaged foods in Canada: 2010 to 2013. *Appl Physiol Nutr Metab* 2016;41(6):684–90.
5. Bernstein JT, Schermer A, Mills CM, L'Abbé MR. Total and free sugar content of Canadian prepackaged foods and beverages. *Nutrients* 2016;8(9):582.
6. Vergeer L, Vanderlee L, Ahmed M, Franco-Arellano B, Mulligan C, Dickinson K, L'Abbé MR. A comparison of the nutritional quality of products offered by the top packaged food and beverage companies in Canada. *BMC Public Health* 2020;20(1):650.
7. Neal B, Sacks G, Swinburn B, Vandevijvere S, Dunford E, Snowdon W, Webster J, Barquera S, Friel S, Hawkes C, et al. Monitoring the levels of important nutrients in the food supply. *Obes Rev* 2013;14(Suppl 1):49–58.
8. Dobbs R, Savers C, Thompson F, Manyika J, Woetzel J, Child P, McKenna S, Spatharou A. Overcoming obesity: an initial economic analysis. New York (USA): McKinsey Global Institute; 2014.
9. Mantilla Herrera AM, Crino M, Erskine HE, Sacks G, Ananthapavan J, Mhurchu CN, Lee YY. Cost-effectiveness of product reformulation in response to the health star rating food labelling system in Australia. *Nutrients* 2018;10(5):614.
10. Federici C, Detzel P, Petracca F, Dainelli L, Fattore G. The impact of food reformulation on nutrient intakes and health, a systematic review of modelling studies. *BMC Nutr* 2019;5:2.
11. World Health Organization. "Best buys" and other recommended interventions for the prevention and control of noncommunicable diseases [Internet]. Geneva (Switzerland): WHO; 2017 [cited 2020 Sep 3]. Available from: <https://apps.who.int/iris/bitstream/handle/10665/259232/WHO-NM-H-NVI-17.9-eng.pdf?sequence=1&isAllowed=y>.
12. Organization for Economic Cooperation and Development. The heavy burden of obesity: the economics of prevention, OECD Health Policy Studies [Internet]. Paris: OECD Publishing; 2019 [cited 2020 Sep 3]. Available from: <https://www.oecd-ilibrary.org/docserver/67450d67-en.pdf?expires=1599081632&id=id&accname=guest&checksum=2DAD70E0D58B55269FEE45F32CCAD7D0>.

13. World Health Organization. Global strategy on diet, physical activity and health [Internet]. Geneva (Switzerland): WHO; 2004 [cited 2020 Jul 10]. Available from: <https://www.who.int/nmh/wha/59/dpas/en/>.
14. Neal B, Sacks G, Shahid M, Taylor F, Huffman M. FoodSwitch: state of the food supply (April 2019) [Internet]. Sydney (Australia): The George Institute for Global Health; 2019 [cited 2020 Jul 10]. Available from: https://www.georgeinstitute.org/sites/default/files/food_supply_report.pdf.
15. Friel S, Labonte R, Sanders D. Measuring progress on diet-related NCDs: the need to address the causes of the causes. *Lancet* 2013;381(9870):903–4.
16. World Health Organization. NCD Global Monitoring Framework [Internet]. Geneva (Switzerland): WHO; 2013 [cited 2020 Jul 10]. Available from: http://www.who.int/nmh/global_monitoring_framework/en/.
17. Access to Nutrition Foundation. Access to Nutrition Index: Global Index 2018 [Internet]. Utrecht (Netherlands): Access to Nutrition Foundation; 2018 [cited 2020 Jul 10]. Available from: <https://accesstonutrition.org/index/global-index-2018/>.
18. Access to Nutrition Foundation. Access to Nutrition Index: U.S. Spotlight Index 2018 [Internet]. Utrecht (Netherlands): Access to Nutrition Foundation; 2018 [cited 2020 Jul 10]. Available from: <https://accesstonutrition.org/countries/us-spotlight-index/>.
19. Access to Nutrition Foundation. Access to Nutrition Initiative: India Spotlight Index 2020 [Internet]. Utrecht (Netherlands): Access to Nutrition Foundation; 2020 [cited 2020 Jul 10]. Available from: <https://accesstonutrition.org/index/india-spotlight-2020/>.
20. Access to Nutrition Foundation. Access to Nutrition Initiative Methodology [Internet]. Utrecht (Netherlands): Access to Nutrition Foundation [cited 2020 Sep 3]. Available from: <https://accesstonutrition.org/methodology/>.
21. Sacks G, Vanderlee L, Robinson E, Vandevijvere S, Cameron AJ, Ni Mhurchu C, Lee A, Ng SH, Karupaiah T, Vergeer L, et al. BIA–Obesity (Business Impact Assessment—Obesity and population-level nutrition): a tool and process to assess food company policies and commitments related to obesity prevention and population nutrition at the national level. *Obes Rev* 2019;20(Suppl 2):78–89.
22. Vanderlee L, Vergeer L, Sacks G, Robinson E, L'Abbé M. Food and beverage manufacturers in Canada: policies and commitments to improve the food environment [Internet]. Toronto (Canada): University of Toronto; 2019 [cited 2020 Jul 10]. Available from: <http://labbelab.utoronto.ca/bia-obesity-canada-2019/>.
23. Sacks G, Robinson E; INFORMAS. Inside our food and beverage manufacturers: assessment of company policies and commitments related to obesity prevention and nutrition, Australia 2018 [Internet]. Melbourne (Australia): Deakin University; 2018 [cited 2020 Jul 10]. Available from: https://docs.wixstatic.com/ugd/2e3337_8ec8e664486e4082b80b420283597219.pdf.
24. Kasture A, Vandevijvere S, Robinson E, Sacks G, Swinburn B. Benchmarking the commitments related to population nutrition and obesity prevention of major food companies in New Zealand. *Int J Public Health* 2019;64(8):1147–57.
25. Cetthakrikul N, Phulkerd S, Jaichuen N, Sacks G, Tangcharoensathien V. Assessment of the stated policies of prominent food companies related to obesity and non-communicable disease (NCD) prevention in Thailand. *Global Health* 2019;15(1):12.
26. Ng S, Sacks G, Kelly B, Yeatman H, Robinson E, Swinburn B, Vandevijvere S, Chinna K, Ismail MN, Karupaiah T. Benchmarking the transparency, comprehensiveness and specificity of population nutrition commitments of major food companies in Malaysia. *Global Health* 2020;16(1):35.
27. Mackay S, Ni Mhurchu C, Swinburn B, Eyles H, Young L, Gontijo de Castro T. State of the food supply: New Zealand 2019 [Internet]. Auckland (New Zealand): The University of Auckland; 2019 [cited 2020 Jul 20]. Available from: https://auckland.figshare.com/articles/State_of_the_Food_Supply_New_Zealand_2019/9636710.
28. International Food and Beverage Alliance. Our commitments new and improved products + smaller portions [Internet]. Geneva (Switzerland): International Food and Beverage Alliance [cited 2020 Jul 10]. Available from: <https://www.ifballiance.org/commitments/product-formulation-and-innovation>.
29. Knai C, Petticrew M, Durand M, Eastmure E, James L, Mehrota A, Scott C, Mays N. Has a public-private partnership resulted in action on healthier diets in England? An analysis of the Public Health Responsibility Deal food pledges. *Food Policy* 2015;54:1–10.
30. Access to Nutrition Foundation. Access to Nutrition Initiative: U.K. product profile 2019 [Internet]. Utrecht (Netherlands): Access to Nutrition Foundation; 2019 [cited 2020 Jul 10]. Available from: <https://accesstonutrition.org/countries/uk-product-profile-2019/>.
31. Scourboutaks MJ, L'Abbé MR. Changes in sodium levels in chain restaurant foods in Canada (2010–2013): a longitudinal study. *CMAJ Open* 2014;2(4):E343–51.
32. Franco-Arellano B, Arcand J, Kim MA, Schermer A, L'Abbé M. Progress towards reducing industrially-produced trans-fatty acids in the Canadian marketplace, 2013–2017. *Public Health Nutr* 2020;(13):2257–67. doi: 10.1017/S1368980019004816.
33. Weippert M, Bernstein JT, L'Abbé M. Changes in the use of free sugars and sweeteners in the Canadian food and beverage supply 2013 to 2017. *Canadian Nutrition Society Annual Conference*; 2019; Niagara Falls, ON, Canada. *Applied Physiol Nutr Metab* 2019;44(4):S52.
34. Euromonitor International. Packaged food in Canada: company shares: national—latest owner: historical: % breakdown [Internet]. London: Euromonitor International; 2016 [cited 2020 Jul 10]. Available from: <https://go.euromonitor.com/passport.html>.
35. Euromonitor International. Soft drinks in Canada: company shares: national—latest owner: historical: % breakdown [Internet]. London: Euromonitor International; 2016 [cited 2020 Jul 10]. Available from: <https://go.euromonitor.com/passport.html>.
36. Canadian Beverage Association. Balance calories [Internet]. Ottawa (Canada): The Conference Board of Canada [cited 2020 Jul 10]. Available from: <http://balancecalories.ca>.
37. World Health Organization. Healthy diet [Internet]. Geneva (Switzerland): WHO; 2018 [cited 2020 Jul 10]. Available from: <https://www.who.int/news-room/fact-sheets/detail/healthy-diet>.
38. Government of Canada. Regulations amending certain regulations made under the Food and Drugs Act (nutrition symbols, other labelling provisions, partially hydrogenated oils and vitamin D) [Internet]. Ottawa (Canada): Canada Gazette, Part 1; 2018 [cited 2020 Jul 10]. Available from: <http://gazette.gc.ca/rp-pr/p1/2018/2018-02-10/html/reg2-eng.html>.
39. Access to Nutrition Foundation. Access to Nutrition Index: Global Index 2018—corporate profile methodology [Internet]. Utrecht (Netherlands): Access to Nutrition Foundation; 2017 [cited 2020 Jul 10]. Available from: <https://accesstonutrition.org/news/global-index-2018-methodology-now-available/>.
40. Sacks G, Mialon M, Vandevijvere S, Trevena H, Snowdon W, Crino M, Swinburn B. Comparison of food industry policies and commitments on marketing to children and product (re)formulation in Australia, New Zealand and Fiji. *Crit Public Health* 2015;25(3):299–319.
41. Sacks G, Swinburn B, Kraak V, Downs S, Walker C, Barquera S, Friel S, Hawkes C, Kelly B, Kumanyika S, et al. A proposed approach to monitor private-sector policies and practices related to food environments, obesity and non-communicable disease prevention. *Obes Rev* 2013;14(Suppl 1):38–48.
42. Trieu K, Neal B, Hawkes C, Dunford E, Campbell N, Rodriguez-Fernandez R, Legetic B, McLaren L, Barberio A, Webster J. Salt reduction initiatives around the world—a systematic review of progress towards the global target. *PLoS One* 2015;10(7):e0130247.
43. Swinburn B, Kraak V, Rutter H, Vandevijvere S, Lobstein T, Sacks G, Gomes F, Marsh T, Magnusson R. Strengthening of accountability systems to create healthy food environments and reduce global obesity. *Lancet* 2015;385(9986):2534–45.
44. Sharma LL, Teret SP, Brownell KD. The food industry and self-regulation: standards to promote success and to avoid public health failures. *Am J Public Health* 2010;100(2):240–6.
45. He FJ, Brinsden HC, MacGregor GA. Salt reduction in the United Kingdom: a successful experiment in public health. *J Hum Hypertens* 2014;28(6):345–52.

46. World Health Organization. Global action plan for the prevention and control of non-communicable diseases 2013–2020 [Internet]. Geneva (Switzerland): WHO; 2013 [cited 2020 Jul 10]. Available from: https://www.who.int/nmh/events/ncd_action_plan/en/.
47. World Health Organization Regional Office for Europe. Better food and nutrition in Europe: a progress report monitoring policy implementation in the WHO European region [Internet]. Geneva (Switzerland): WHO; 2018 [cited 2020 Jul 10]. Available from: http://www.euro.who.int/__data/assets/pdf_file/0005/355973/ENP_eng.pdf.
48. World Health Organization. SHAKE the salt habit: the SHAKE technical package for salt reduction [Internet]. Geneva (Switzerland): WHO; 2016 [cited 2020 Jul 10]. Available from: <https://www.who.int/dietphysicalactivity/publications/shake-salt-habit/en/>.
49. World Health Organization. Policy brief: producing and promoting more food products consistent with a healthy diet [Internet]. Geneva (Switzerland): WHO; 2014 [cited 2020 Jul 10]. Available from: <https://www.who.int/nmh/ncd-coordination-mechanism/Policybrief32.pdf>.
50. WHO/PAHO Regional Expert Group for Cardiovascular Disease Prevention through Population-wide Dietary Salt Reduction Sub-group on industry liaison. A guide for setting targets and timelines to reduce the salt content of food [Internet]. Geneva (Switzerland): WHO; 2013 [cited 2020 Jul 10]. Available from: <https://www.paho.org/hq/dmdocuments/2013/Guide-setting-targets-timelines.pdf>.
51. Health Canada. Guidance for the food industry on reducing sodium in processed foods [Internet]. Ottawa (Canada): Bureau of Nutritional Sciences Food Directorate Health Products and Food Branch; 2012 [cited 2020 Jul 10]. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/legislation-guidelines/guidance-documents/guidance-food-industry-reducing-sodium-processed-foods-2012.html>.
52. Public Health England. Calorie reduction: the scope and ambition for action [Internet]. London: Public Health England; 2018 [cited 2020 Jul 10]. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/800675/Calories_Evidence_Document.pdf.
53. Australian Government Department of Health. Guide for industry to the Health Star Rating Calculator (HSRC) [Internet]. Canberra (Australia): Australian Government; 2018 [cited 2020 Jul 10]. Available from: <http://healthstarrating.gov.au/internet/healthstarrating/publishing.nsf/Content/guide-for-industry-document>.
54. Nestlé. Nestlé policy on sodium (salt) [Internet]. Vevey (Switzerland): Nestlé SA; 2017 [cited 2020 Jul 10]. Available from: https://www.nestle.com/sites/default/files/asset-library/documents/library/documents/about_us/nestle-policy-salt.pdf.
55. Nestlé. The Nestlé Nutritional Profiling System, its product categories and sets of criteria [Internet]. Vevey (Switzerland): Nestlé SA [cited 2020 Jul 10]. Available from: https://www.nestle.com/sites/default/files/asset-library/documents/library/documents/nutrition_health_wellness/nestle-nutritional-profiling-system.pdf.
56. Nestlé. Nestlé policy on saturated fat [Internet]. Vevey (Switzerland): Nestlé SA; 2014 [cited 2020 Jul 10]. Available from: http://www.nestle.com/asset-library/documents/library/documents/about_us/nestle-policy-saturated-fat.pdf.
57. Danone. Nutritional targets 2020. Product categories and nutrient thresholds [Internet]. Paris: Danone SA; 2017 [cited 2020 Jul 10]. Available from: https://www.danone.com/content/dam/danone-corp/danone-com/about-us-impact/policies-and-commitments/en/2017/2017_04_NutritionalTarget2020.pdf.
58. Danone. Nutrition achievements 2017 [Internet]. Paris: Danone SA; 2017 [cited 2020 Jul 10]. Available from: https://www.danone.com/content/dam/danone-corp/danone-com/about-us-impact/policies-and-commitments/en/2018/Nutrition_Achievements_2017_Leaflet.pdf.
59. Unilever. Unilever's position on salt reduction [Internet]. London: Unilever PLC/Unilever NV [cited 2020 Oct 14]. Available from: https://www.unilever.com/Images/salt-reduction-position-statement_tcm244-414411_1_en.pdf.
60. Loblaw Companies Limited. 2015 Corporate social responsibility report [Internet]. Brampton (Canada): Loblaw Companies Limited; 2015 [cited 2020 Jul 10]. Available from: https://www.loblaw.ca/content/dam/lc/corp/pdfs/Responsibility/Reports/CSRR/en/2015/Loblaw_2015_CSR_Report_ENG.pdf.
61. Vandevijvere S, Kasture A, Sacks G, Robinson E, Mackay S, Swinburn B. Committing to health: food company policies for healthier food environments. Company assessments and recommendations using the Business Impact Assessment on obesity and population nutrition (BIA-Obesity) tool. New Zealand 2017 [Internet]. Auckland (New Zealand): The University of Auckland; 2018 [cited 2020 Jul 10]. Available from: <https://figshare.com/s/f29767b39641ffecd5f>.
62. Vlassopoulos A, Masset G, Charles VR, Hoover C, Chesneau-Guillemont C, Leroy F, Lehmann U, Spieldecker J, Tee ES, Gibney M, et al. A nutrient profiling system for the (re)formulation of a global food and beverage portfolio. *Eur J Nutr* 2017;56(3):1105–22.
63. Alexander E, Yach D, Mensah GA. Major multinational food and beverage companies and informal sector contributions to global food consumption: implications for nutrition policy. *Global Health* 2011;7:26.
64. Murphy SA, Weippert MV, Dickinson KM, Scourboutakos MJ, L'Abbé MR. Cross-sectional analysis of calories and nutrients of concern in Canadian chain restaurant menu items in 2016. *Am J Prev Med* 2020;59(4):e149–e159. doi: 10.1016/j.amepre.2020.05.005.
65. Health Canada. Sodium reduction in processed foods in Canada: an evaluation of progress toward voluntary targets from 2012 to 2016 [Internet]. Ottawa (Canada): Health Canada; 2018 [cited 2020 Jul 10]. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/legislation-guidelines/guidance-documents/guidance-food-industry-reducing-sodium-processed-foods-progress-report-2017.html>.
66. Hysemi L, Elliot-Green A, Lloyd-Williams F, Kypridemos C, O'Flaherty M, McGill R, Orton L, Bromley H, Cappuccio FP, Capewell S. Systematic review of dietary salt reduction policies: evidence for an effectiveness hierarchy? *PLoS One* 2017;12(5):e0177535.
67. Canadian Food Inspection Agency. Notice of modification: prohibiting the use of partially hydrogenated oils (PHOs) in foods [Internet]. Ottawa (Canada): Canadian Food Inspection Agency; 2019 [cited 2020 Jul 10]. Available from: <http://www.inspection.gc.ca/food/requirements/food-safety-standards-guidelines/notice-of-modification-phos/eng/1536939719584/1536939792275>.
68. World Health Organization. Countdown to 2023: WHO Report on Global Trans Fat Elimination 2019 [Internet]. Geneva (Switzerland): WHO; 2019 [cited 2020 Jul 10]. Available from: <https://apps.who.int/iris/bitstream/handle/10665/331300/9789241516440-eng.pdf>.
69. Vandenbrink D, Pauzé E, Potvin Kent M. Strategies used by the Canadian food and beverage industry to influence food and nutrition policies. *Int J Behav Nutr Phys Act* 2020;17(1):3.
70. Scott C, Hawkins B, Knai C. Food and beverage product reformulation as a corporate political strategy. *Soc Sci Med* 2017;172:37–45.
71. UK Health Forum. Public health and the food and drinks industry: the governance and ethics of interaction. Lessons from research, policy and practice [Internet]. London: UK Health Forum; 2018 [cited 2020 Jul 10]. Available from: <https://www.idrc.ca/sites/default/files/sp/Documents%20EN/ukhf-casebook-jan18.pdf>.
72. Kickbusch I, Allen L, Franz C. The commercial determinants of health. *Lancet Glob Health* 2016;4:e895–e6.
73. Kraak VI, Swinburn B, Lawrence M, Harrison P. An accountability framework to promote healthy food environments. *Public Health Nutr* 2014;17(11):2467–83.
74. Health Canada. Canada's food guide [Internet]. Ottawa (Canada): Health Canada; 2019 [cited 2020 Jul 10]. Available from: <https://food-guide.canada.ca/en/>.
75. Buttriss JL. Food reformulation: the challenges to the food industry. *Proc Nutr Soc* 2013;72(1):61–9.
76. Kanter R, Vanderlee L, Vandevijvere S. Front-of-package nutrition labelling policy: global progress and future directions. *Public Health Nutr* 2018;21(8):1399–408.