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Choosing front-of-package food labelling nutritional criteria: how smart were 'Smart Choices'?

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Abstract

Objective: The 'Smart Choices' programme was an industry-driven, front-of-package (FOP) nutritional labelling system introduced in the USA in August 2009, ostensibly to help consumers select healthier options during food shopping. Its nutritional criteria were developed by members of the food industry in collaboration with nutrition and public health experts and government officials. The aim of the present study was to test the extent to which products labelled as 'Smart Choices' could be classified as healthy choices on the basis of the Nutrient Profile Model (NPM), a non-industry-developed, validated nutritional standard.
Design: A total of 100 packaged products that qualified for a 'Smart Choices' designation were sampled from eight food and beverage categories. All products were evaluated using the NPM method.
Results: In all, 64 % of the products deemed 'Smart Choices' did not meet the NPM standard for a healthy product. Within each 'Smart Choices' category, 0 % of condiments, 8·70 % of fats and oils, 15·63 % of cereals and 31·58 % of snacks and sweets met NPM thresholds. All sampled soups, beverages, desserts and grains deemed 'Smart Choices' were considered healthy according to the NPM standard.
Conclusions: The 'Smart Choices' programme is an example of industries' attempts at self-regulation. More than 60 % of foods that received the 'Smart Choices' label did not meet standard nutritional criteria for a 'healthy' food choice, suggesting that industries' involvement in designing labelling systems should be scrutinized. The NPM system may be a good option as the basis for establishing FOP labelling criteria, although more comparisons with other systems are needed.

Keywords
'Smart Choices'
Front-of-package food labels
Food labelling
Obesity

Poor diet and obesity are associated with serious medical illnesses and place significant strain on health-care systems[1,2]. One strategy to promote healthier eating is to educate consumers through the provision of nutritional labels on the front of packaged foods. Many countries have already adopted a front-of-package (FOP) labelling system, like the Choices logo in the Netherlands[3] or the Multiple Traffic Light in the UK[4]. In the USA, different food manufacturers have created their own logos to appear on packaged foods, which has led to consumer confusion[5].

To address the vexing array of FOP labels in the USA, a group of 'scientists, academicians, nutrition educators, public health organizations, food manufacturers, retailers and government observers' formed the Keystone Food and Nutrition Roundtable in 2007[6]. The members of the Roundtable included major food manufacturers and the American Society for Nutrition, as well as NSF International, a not-for-profit company[6]. The stated goal of the group's discussions was to create science-based nutritional criteria that would enable the classification of products within a food or beverage category as a 'better-for-you' choice. The result was the development of the 'Smart Choices' labelling programme, which granted products meeting certain nutritional standards a label containing a green checkmark and text that read 'Smart Choices Program Guiding Good Choices'. The label also included information about energy per serving and servings per package[6].

The Roundtable stated that the nutritional criteria for 'Smart Choices' were developed on the basis of the 2005 Dietary Guidelines for Americans[6]. In addition, the criteria were guided by reports from the Institute of Medicine (IOM) and nutrition-labelling regulations put forth by the US Department of Agricultures' Food Safety and Inspection Service and the US Food and Drug Administration (FDA)[6]. The 'Smart Choices' criteria were

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applied to foods in nineteen product categories, which were evaluated on the basis of amounts of nutrients to limit. These nutrients included energy, total fat, saturated fat, *trans* fat, cholesterol, added sugars and Na[6]. Some product categories were also evaluated on the basis of nutrients to encourage, namely those that included K, fibre, vitamin E, Ca, Mg and vitamins A and C[6]. The nutritional criteria also took into account whether a product encouraged consumption of foods belonging to specific food groups, including fruit, vegetables, whole grains and fat-free/low-fat milk products[6].

When the 'Smart Choices' programme was launched in the USA in August 2009, it was met with scepticism. The FDA sent a cautionary letter to the general manager of the 'Smart Choices' committee indicating that the programme would be monitored[7]; moreover, news outlets such as the *New York Times* wondered how sugary cereals like Froot Loops and Cookie Crisp could be considered 'Smart Choices'[8]. Shortly after a Connecticut Congresswoman and the Connecticut Attorney General called for investigations into the possibly misleading nature of the 'Smart Choices' programme[9,10], the FDA announced an FOP labelling initiative to work with the food industry, nutrition experts and the IOM to develop nutritional criteria for an FOP labelling system that could be uniformly implemented[11]. In response to this announcement, the 'Smart Choices' programme declared that it would postpone operations[12].

The goal of the current FDA and IOM efforts is to develop a voluntary FOP system that would provide consumers with easily understandable nutrition information that can be used quickly when making food choices. However, the nutritional criteria that should be used and the extent of the food industry's role in developing these criteria remain the subject of ongoing debates. Therefore, the goal of the present study was to determine how the 'Smart Choices' FOP nutritional criteria, which were developed by members of the food industry working together with scientists and government officials, compare with a non-industry-developed nutritional standard that could be used as the basis for an FOP labelling system in the USA and around the world. We believe that the results of such a comparison can provide guidance for government agencies as they consider the role that the food industry should play in creating nutritional standards and the type of nutritional standards that should be used.

The specific aim of the present study was to determine the proportion of 'Smart Choices' products deemed healthy by non-industry-developed, validated nutritional criteria[13]. The nutritional standard used for comparison was the Nutrient Profile Model (NPM) developed for the UK Food Standards Agency by Rayner *et al.*[13], which provides a numerical score to rank products on overall nutritional content. The model is used by the UK government to identify healthy foods that can be advertised to children on television[14]; the Australian government's Food Standards Code has used a version of this model to determine those products that can carry health claims[15].

Methods

A list of approved 'Smart Choices' products across nineteen food and beverage categories was compiled from the 'Smart Choices' website (as of 17 October 2009)[16]. The following eight food categories were selected for the present study: sauces, dressings and condiments; fats, oils and spreads; cereals; snack foods and sweets; desserts; soups, meal sauces and mixed side dishes; beverages; and bread, grains, pasta and flour. The following food categories did not have products listed on the 'Smart Choices' website at the time of our analysis and were therefore excluded: cheese and cheese substitutes; milk, dairy products and dairy substitutes; chewing gum; and water. In addition, the present study focused only on packaged foods; therefore, the meat, fish, poultry and fruit and vegetable categories were excluded. In addition, the NPM requires the percentage of fruit, vegetables and/or nuts in a food to determine a score for foods composed of 40 % or more of these ingredients. Because this information is not listed on the nutritional facts panel in the USA, we did not analyse categories consisting primarily of such products (i.e. tomato sauces, frozen dinners with vegetables).

Once the categories were identified, we extracted the lists of products within each category appearing on the 'Smart Choices' website[16]. These lists often contained multiple versions of the same item (e.g. the same product in a different packaging size). Given the redundancy of products, we applied the following rules to generate a final list of non-duplicated versions of products to be analysed. (i) When a product and its multiple flavours were listed, we selected 'the original' version; if there was no original flavour, we randomly selected a flavour. For example, both original Lucky Charms and Chocolate Lucky Charms were 'Smart Choices'; therefore, we selected only original Lucky Charms for our analysis. However, we included different versions of the same product if its title indicated a meaningful nutritional difference (e.g. Frosted Flakes and Reduced Sugar Frosted Flakes). (ii) If the identical product was produced by multiple manufacturers, we randomly chose one product (e.g. there were five brands of long-grain brown rice; therefore, we evaluated only one brand). Nutrition information for all selected products was then obtained from the manufacturers' websites in October 2009. When nutrition information was not available online, we retrieved the information from the actual product label found at a local supermarket. We excluded products that could not be found online or in a nearby supermarket.

The nutrition information was then collected and entered into the NPM program to generate a nutritional score. This method assigns numerical values to the

Table 1 Comparison of `Smart Choices' and NPM nutritional criteria

	Smart Choices	NPM
Similarities		
Positive credit for fibre	Yes	Yes
Positive credit for fruit and vegetable content	Yes	Yes
Nutrients to limit: saturated fat, Na	Yes	Yes
Differences		
Positive credit for Ca	Yes	No
Positive credit for K	Yes	No
Positive credit for Mg	Yes	No
Positive credit for vitamin A	Yes	No
Positive credit for vitamin C	Yes	No
Positive credit for vitamin E	Yes	No
Positive credit for whole grains	Yes	No
Positive credit for fat-free/low-fat milk products	Yes	No
Nutrients to limit: total fat, trans fat, cholesterol	Yes	No
Uniform criteria across all food/beverage categories	No	Yes
Positive credit for protein	No	Yes
Positive credit for nut content	No	Yes
Presence of negative nutrients affects score more negatively than positive nutrients	No	Yes
Nutrients to limit: energy	No	Yes
Nutrients to limit: total sugar	No (only added sugar)	Yes
Nutrients scored on a gradient	No (threshold only)	Yes

NPM, Nutrient Profile Model.

products on the basis of a point system that is reverse scored, with lower scores indicating healthier products[13]. Products gain points for negative nutritional attributes (amount of energy, saturated fat, sugar or Na that surpasses specified threshold values) and lose points for positive nutritional attributes (higher-than-threshold amounts of fruit/vegetables/nuts, fibre and protein). Foods are classified as 'less healthy' if their score is ≥ 4 and beverages are classified as 'less healthy' if their score is ≥ 1. The NPM was chosen as the standard of comparison because it is a thoroughly tested approach, has informed policy decisions in the UK and Australia and was validated to reflect nutritionists' evaluations of healthy and unhealthy foods[17,18]. In addition, unlike 'Smart Choices', the NPM does not consider vitamins and minerals that may be added to products of poor nutritional quality to make them appear healthier. The NPM also applies uniform nutritional standards across products, whereas the 'Smart Choices' criteria differ across products ;(see Table 1 for a comparison of the NPM and 'Smart Choices' criteria).

Results

A total of 207 products were extracted from the 'Smart Choices' website; 112 unique products were selected using the criteria described previously and we were able to retrieve nutrition information for 100 of those products. These products were then analysed using the NPM. Overall, sixty-four (64·00 %) products deemed 'Smart Choices' did not meet the NPM standard for a healthy product. The results for each product category are described below (see Table 2 for all results, including product NPM scores).

- Condiments: Of the three analysed condiments, none (0 %) met the NPM standard.
- Fats, oils and spreads: Of the twenty-three analysed fats, oils and spreads, two (8·70 %) met the NPM standard.
- Cereals: Of the thirty-two analysed cereals, five (15·63 %) met the NPM standard.
- Snacks and sweets: Of the nineteen analysed snacks and sweets, six (31·58 %) met the NPM standard.
- Desserts: Five desserts were listed as 'Smart Choices' and all represented different flavours of one brand of ice cream. Therefore, only one item was analysed and it met the NPM standard (100 %).
- Soups: All nineteen of the analysed soups met the NPM standard (100 %).
- Beverages: All beverages listed were tea. All seven chosen for analysis met the NPM standard (100 %).
- Bread, grains, pasta and flour: One rice product was analysed and it met the NPM standard (100 %). Nutrition information was unavailable for the eligible bread product.

Discussion

In all, 64 % of the products that qualified for a 'Smart Choices' logo did not meet the NPM nutritional standard. Of greater concern was that the majority of 'Smart Choices' products for cereals, sweets and snacks, fats, oils and spreads, and condiments did not meet the NPM standard. However, all desserts, soups, beverages and bread and grain products met the NPM standard, suggesting that the criteria applied to these categories were appropriately

Table 2 `Smart Choices' products and NPM scores

Product name (total)	Number of products meeting NPM threshold*		NPM score*
	n	%	
Total products (n 100)	36	36	
Condiments (n 3)	0	0	
Hellmann's (Real Mayonnaise)			25
Hellmann's (Light Mayonnaise)			11
Gulden's (Yellow Mustard)			11
Fats/oils (n 23)	2	8·70	
I Can't Believe It's Not Butter! Mediterranean Blend			24
Shedd's Spread Country Crock Original			23
Shedd's Spread Country Crock Omega Plus			23
Promise Buttery Spread			23
Brummel and Brown Strawberry Creamy Fruit Spread			22
Shedd's Spread Country Crock Churn Style			21
Blue Bonnet Homestyle Soft Spread			21
Shedd's Spread Country Crock Light			20
I Can't Believe It's Not Butter! Light			20
I Can't Believe It's Not Butter! Original			19
Wesson Corn Oil			19
Wesson Soybean and Canola			19
Wesson Soybean Oil			19
Shedd's Spread Country Crock Calcium plus Vitamin D			18
Fleischmann's Unsalted Margarine			18
Blue Bonnet Homestyle Soft Spread Light			17
Promise Light Spread			17
Promise Activ Light Spread			17
Wesson rapeseed oil			15
I Can't Believe It's Not Butter! Fat Free			7
Promise Fat Free Spread			7
I Can't Believe It's Not Butter! Spray			0
Pam Original			0
Cereals (n 32)	5	15·63	
Cocoa Krispies			18
Froot Loops			17
Lucky Charms			17
Corn Pops			17
Apple Jacks			16
Cocoa Puffs			16
Cookie Crisp			16
Rice Krispies			16
Rice Krispies Treats			16
Frosted Krispies			16
Keebler Cookie Crunch			15
Froot Loops (Reduced Sugar)			14
Frosted Flakes			14
Fruit Harvest (Strawberry/Blueberry)			13
Frosted Flakes (Reduced Sugar)			12
Crispix			11
Product 19			10
Special K			10
Corn Flakes			9
Quaker Oatmeal Squares			8
Mother's (Toasted Oat Bran)			8
Mueslix			8
Quaker Life (Regular)			8
Quaker Instant Oatmeal (High Fiber Maple and Brown Sugar)			8
Smart Start (Healthy Heart Cinnamon Raisin)			7
Cheerios			6
Quaker (Oat Bran)			6
All-Bran			−1
Special K (Low Carb Lifestyle Protein Plus)			−1
Frosted Mini-Wheats (Bite Size)			−2
Quaker Instant Oatmeal			−3
Mini-Wheats (Unfrosted Bite Size)			−6
Snacks and sweets (n 19)	6	31·58	
Kraft Macaroni and Cheese Baked Cheese Crackers			21
Orville Redenbacher (Smart Pop Butter Microwave Popcorn (10-Pack))			19
Ritz Bits Cracker Sandwiches			18
Honey Maid Bees Graham Snacks (Honey)			16

Table 2 Continued

Product name (total)	Number of products meeting NPM threshold*		NPM score*
	n	%	
Teddy Grahams Snacks (Honey)			15
Orville Redenbacher (Smart Pop Kettle Corn Microwave Popcorn (3-Pack))			15
Barnum's Animal Crackers			15
Cheese Nips Thin Crisps 100 Calorie Pack			14
Wheat Thins Crackers			13
Wheat Thins Crackers (Reduced Fat)			12
Fiber One Chewy Bar (Oats & Apple Streusel)			9
Wheat Thins Crackers (Hint of Salt)			8
Fudgsicle Low Fat (Original Fudge Bars)			7
Popsicle Firecracker (Cherry, White Lemon, Blue Raspberry)			3
Popsicle Sugar Free (Orange, Cherry, Grape)			0
Popsicle Healthy Bunch Variety Pack (Creamsicle Sugar Free)			0
Fudgsicle No Sugar Added (Original Fudge Bars)			−3
Orville Redenbacher (Original Kernel Jar 1 lb 14 oz)			−7
Orville Redenbacher (White Kernel Jar 12/30 oz)			−7
Desserts (n 1)	1	100	
Brayers Smooth & Dreamy Fat Free Ice Cream (Creamy Vanilla)			−1
Soups (n 19)	19	100	
Healthy Choice Soups (Chicken with Rice)			1
Healthy Choice Soups (Zesty Gumbo with Chicken & Sausage)			1
Healthy Choice Soups (Chicken & Dumplings)			0
Healthy Choice Soups (Fiesta Chicken)			0
Healthy Choice Soups (New England Clam Chowder)			0
Healthy Choice Soups (Old Fashioned Chicken Noodle)			0
Healthy Choice Soups (Beef Pot Roast (Can))			0
Healthy Choice Soups (Vegetable Barley Microwaveable Bowl)			0
Healthy Choice Soups (Country Vegetable)			−1
Healthy Choice Soups (Garden Vegetable)			−1
Healthy Choice Soups (Hearty Chicken)			−1
Healthy Choice Soups (Bean and Ham)			−2
Healthy Choice Soups (Italian Wedding Style)			−2
Healthy Choice Soups (Split Pea and Ham)			−2
Healthy Choice Soups (Vegetable Beef)			−2
Healthy Choice Soups (Minestrone (Can))			−2
Healthy Choice Soups (Steak and Noodle Microwaveable Bowl)			−2
Healthy Choice Soups (Traditional Lentil Microwaveable Bowl)			−2
Healthy Choice Soups (Chicken Tortilla)			−3
Beverages (n 2)	2	100	
Lipton Tea			0
Lipton Green Tea			0
Breads and Grains (n 1)	1	100	
Carolina Rice			0

NPM, Nutrient Pro□le Model.
*Foods are classi□ed as `less healthy' if their score is ≥4 and beverages are classi□ed as `less healthy' if their score is ≥1.

stringent. Overall, this comparison between the NPM and the 'Smart Choices' systems suggests that the 'Smart Choices' nutritional criteria were not rigorous enough and were particularly lax for specific product categories. For example, Cocoa Krispies and Froot Loops cereals boasted 'Smart Choices' labels despite earning some of the poorest NPM scores.

A standardized FOP nutrition label that quickly alerts customers to healthy choices has the potential to help consumers make better choices when shopping for food. However, these findings provide evidence that there is considerable risk that nutritional criteria developed and implemented by the food industry, even with scientists involved, will lead to misleading labels. These findings are consistent with inadequate food industry self-regulation in other arenas, including child-targeted marketing and guidelines for selling sugar-sweetened beverages in schools[19]. Lessons from the tobacco and alcohol industries also caution against industry self-regulation where public health is concerned[19].

Furthermore, focus group research on FOP labelling systems has found that consumers want a credible labelling system[20–23]. In a series of European studies, systems created and endorsed by the food industry were often perceived as less credible compared with systems endorsed by national or international health organizations[20–23]. These findings taken together with the current study on the 'Smart Choices' nutritional criteria suggest that it may be important to use caution when involving the industry in the development of FOP label nutritional criteria. The 'Choices Programme', an FOP labelling system that might have promise, involves the industry; however, the nutritional

criteria are 'developed by independent, leading scientists'[24], unlike the 'Smart Choices' criteria, in the creation of which industry had a role.

The present study is limited because not all 'Smart Choices' products were analysed and some categories of products had few possible products for analysis. However, the latter limitation tended to work in favour of the 'Smart Choices' criteria (i.e. there was only one dessert listed and it met the NPM standard). In addition, only two possible FOP nutritional criteria were compared.

Future research should compare the NPM standard with other possible FOP nutritional criteria and examine how it might influence consumer behaviour. It will also be important to have non-industry-funded scientists evaluate and validate proposed FOP nutritional criteria, given the potential bias towards industry-funded research confirming favourable hypotheses and downplaying unfavourable results[25,26]. Overall, the findings indicate that the NPM criteria provide a more rigorous classification of food products and should be considered as an option for FOP labelling system nutritional criteria.

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