

Short Communication

Differences in the nutritional content of baby and toddler foods with front-of-package nutrition claims issued by manufacturers v. governments/health organizations

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Abstract

Objective: Nutritional information panels are required on all packaged food products in the USA, yet are perceived as difficult to use by consumers. Nutritional symbols have been developed by various groups to assist consumers in making healthier food purchases. Different nutritional criteria are used depending on the authorizing body of these symbols. The present study assesses the nutrient profile of baby and toddler foods in light of their accompanying nutritional symbols.

Design: Kruskal–Wallis and χ^2 tests were used to assess differences in the nutritional content of products based on the presence and issuing body of nutritional symbols.

Setting: Nine grocery, drug and department stores in Philadelphia, PA, USA.

Subjects: Two hundred and forty packaged baby and toddler foods.

Results: Products whose nutritional symbol was issued by government/health professionals contained significantly more Ca ($P=0.002$), fibre ($P=0.001$), protein ($P=0.005$), vitamin A ($P=0.011$), vitamin C ($P<0.001$) and Zn ($P<0.001$) and less sugar ($P=0.004$) per serving than products without a nutritional symbol and products whose nutritional symbol was issued by the manufacturer.

Conclusions: Products with a nutritional symbol issued by government/health professionals were healthier than foods with nutritional symbols issued by the manufacturer directly and foods with no nutritional symbols.

Keywords
Food and nutrition
Food marketing
Children
Public health
Childhood obesity

Childhood obesity is a growing problem in Westernized countries and has been linked to a variety of adverse health outcomes^(1,2). Various social factors related to decreased physical activity and changing dietary patterns that involve eating less fresh vegetables, milk and whole-grain breads and eating more high-energy pre-packaged foods have consistently been shown to be associated with rising obesity levels in adults and in children⁽¹⁾. A literature review of strategies to prevent childhood obesity suggests that obesity prevention activities can begin in infancy⁽²⁾.

Early childhood is a critical window to establish healthy eating as food preferences are established early. A previous study examining the nutritional content of baby/toddler foods available in the Canadian marketplace found that some products targeted at babies and toddlers actually contained more sugar and salt per serving than similar products targeted for adult consumption⁽³⁾. Another Canadian study found that 89% of packaged products targeted at children were of poor nutritional quality⁽⁴⁾. This is even

more surprising given that the study had excluded 'junk' foods such as candy, soft drinks, potato chips and cakes⁽⁴⁾.

Nutritional information panels are required on packaged foods in the USA to help consumers make healthier choices⁽⁵⁾; however, single nutrient claims that are not reflective of the overall nutrient profile are permitted⁽²⁾. For example, a product can have a front-of-package claim that reads 'low in fat' when the product is also high in sugar and Na^(2,6). This is problematic as research shows that parents often do not use nutrition labels when shopping with their children due to the amount of time it takes to read these labels; instead they rely on front-of-package claims or the presence of a nutritional symbol to determine 'healthier' options⁽⁷⁾.

Several nutritional symbols have been designed by various organizations to make it easier for consumers to identify healthier foods that meet set nutritional criteria and reflect the overall content of the food product. For example, the American Heart Association Heart Check

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programme in the USA allows companies meeting guidelines related to saturated fat and cholesterol to display the Heart Check symbol on their packaging⁽⁸⁾, while the National Heart Foundation in New Zealand administers a voluntary Pick the Tick symbol that companies can apply to display on their pre-packaged foods if they meet specific criteria related to the Ca, fibre, Na, sugar, saturated fat and total fat content of each product⁽⁹⁾. Some manufacturers have also developed their own nutritional symbols (i.e. Kraft Sensible Solutions, Kellogg's Nutrition at a Glance) to indicate which of their products are healthier – although their criteria to determine 'healthier' varies⁽⁸⁾.

The present study aimed to examine the nutritional profile of products targeted at babies and toddlers based on the presence/absence of nutritional symbols and the issuing body of nutritional symbols (i.e. manufacturer *v.* government/health professionals/etc.).

Methods

The researchers visited a total of nine stores located in Philadelphia, PA, USA in October 2010. These included grocery (ACME, Super Fresh, Genuardi's Family Markets (Safeway), Shop-Rite, Whole Foods Market), drug (CVS Pharmacy, Walgreens) and department (Target, Wal-Mart) stores. They purchased all packaged foods that were targeted for consumption by babies and toddlers. Duplicate products were not included in the study. All products marked as baby or toddler foods located in the baby and toddler aisle/section of the store were included, except for single-ingredient puréed fruits and vegetables. Fruit and vegetable purées can be classified as 'pure' foods (i.e. single-ingredient purées without added salt or sugar) as compared with 'prepared' foods that involve multiple ingredients⁽³⁾. All beverage products, juices and infant formulas/cereals that are designed to be mixed with breast milk or water were also excluded.

A trained graduate research assistant coded each product for forty-five distinct elements related to the product packaging, target eater, price, ingredients and nutritional content. Data on nutritional content were obtained from the nutrition information panel and the ingredient list as these are the elements that consumers have at their disposal when making purchasing decisions. The research assistant

documented whether or not the packaging had a special manufacturers' created pledge, mark or symbol (e.g. 'With Vita Blocs', Heinz Purity Assurance Heart, Beech Nut's Advancing Nutrition mark). If yes, she further coded where the authority of the health claim came from (the authorizing body is the company (e.g. Heinz Quality Assurance); the authorizing body is health professionals (i.e. dietitians); the authorizing body is the Heart and Stroke Foundation; the authorizing body is a government body (e.g. US Department of Agriculture); or unclear who the authorizing body is). Information on specific front-of-packaging health claims (i.e. 'low in sodium') was documented separately from information on nutritional symbols.

Descriptive statistics (proportions, medians and minimum–maximum ranges) were used to create a profile of baby/toddler foods available in Philadelphia. Kruskal–Wallis equality of proportions rank tests (continuous variables) and χ^2 tests (categorical variables) were used to assess for differences in the nutritional content of products based on the presence/absence of a nutritional symbol and the issuing body of the symbol (manufacturer *v.* government/health professionals). *P* values <0.05 were considered statistically significant for all tests. All analyses were conducted using the statistical software package Stata SE version 12.

Results

Overall, 240 unique products were identified consisting of puréed baby dinners and desserts, toddler entrées, snacks and cereals (see Table 1). Approximately 80% of these products (*n* 195) contained at least one of the nineteen observed nutritional symbols. Of the products with a nutritional symbol, 111 products (56.9%) had a nutritional symbol issued by the manufacturer itself (e.g. Nestlé Nutritional Compass, Beech Nut Advancing Nutrition), eighty products (41.0%) had a symbol issued by a government agency (e.g. US Department of Agriculture) and one product (0.5%) had a symbol that was issued by a health professional group. For three (1.5%) products it was unclear who issued the symbol, and these products have been removed from all further analyses.

Regardless of whether a nutritional symbol was present, all but two products (neither of which contained a nutritional symbol) contained at least one front-of-package

Table 1 Presence of nutritional symbol by type of food products in a survey of packaged baby and toddler foods (*n* 240) in nine grocery, drug and department stores, Philadelphia, PA, USA, October 2010

Type of food	Does not contain a nutritional symbol		Symbol issued by the manufacturer		Symbol issued by government or health professionals	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Puréed dinner (baby)	6	13.3	33	29.7	44	54.3
Puréed dessert (baby)	1	2.2	17	15.3	8	9.9
Entrée dinner (toddler)	11	24.4	18	16.2	0	0.0
Snack	27	60.0	42	37.8	28	34.6
Cereal	0	0.0	1	0.9	1	1.2

nutritional claim. Few appreciable differences were noted in the content of these nutritional claims based on the issuing body of the nutritional symbol (see Table 2). Products whose nutritional symbol was issued by government/health professionals were the most likely to claim to not contain artificial colours ($P=0.002$) or preservatives ($P<0.001$) and were the least likely to claim that they were made with real fruit/yoghurt/etc. ($P<0.001$).

Products whose nutritional symbol was issued by government or health professionals had a different nutrient profile than products whose nutritional symbol was issued by the manufacturer (see Table 3). Cut-off points for each nutrient (a little ($\leq 5\%$), a moderate amount (6–14%), a lot ($\geq 15\%$)) are based on Health Canada's guidelines for interpreting nutritional labels⁽¹⁰⁾. Products whose nutritional symbol was issued by government/health professionals contained significantly more Ca ($P=0.002$), fibre ($P=0.001$), protein ($P=0.005$), vitamin A ($P=0.011$), vitamin C ($P<0.001$) and Zn ($P<0.001$) and less sugar ($P=0.004$) per serving than products without a nutritional symbol and products whose nutritional symbol was issued by the manufacturer. Despite no front-of-package claims to specifically promote this, products whose nutritional symbols were issued by the manufacturer had significantly more Fe ($P=0.001$) and vitamin E ($P<0.001$) per serving than products without a nutritional symbol or products whose nutritional symbol was issued by government or health professionals.

Discussion

In general, products with and without nutritional symbols or nutritional symbols issued by different authorizing bodies did not differ in advertising characteristics or front-of-package nutritional claims. However, products with a nutritional symbol issued by government/health professionals had a different nutrient profile than products with nutritional symbols issued by the manufacturer directly and products with no nutritional symbols. The discrepancy between the appearance of a nutritional symbol and food content can be confusing for consumers and raises ethical and regulatory concerns because manufacturer-developed nutritional symbols are among the most commonly used nutritional marketing tools. Almost all products in the present study contained a least one front-of-package nutritional claim. This is not unique to baby/toddler foods, as another study examining nutrition claims on all packaged products sold in US grocery stores found that 49% of products had some sort of nutrition claim on their labels and of these 48% contained high levels of sugar, Na or fat⁽⁶⁾. Results were more skewed when the sample was limited to food products targeted at children; 71.0% of products contained a nutrition claim and 58.6% of these contained high levels of sugar, Na or fat⁽⁶⁾. Manufacturer-developed nutritional symbols were among the most commonly

Table 2 The difference in front-of-package nutritional claims by issuing body in a survey of packaged baby and toddler foods ($n=240$) in nine grocery, drug and department stores, Philadelphia, PA, USA, October 2010

Type of nutritional claim	No symbol			Symbol issued by the manufacturer			Symbol issued by government or health professionals			χ^2 *	P value
	n	%	95% CI	n	%	95% CI	n	%	95% CI		
Product claims to be a source of calcium	7	15.6	4.8, 26.3	17	15.3	8.6, 22.1	13	16.0	8.0, 24.1	0.02	0.990
Product claims to be a source of iron	9	20.0	8.1, 31.9	24	21.6	13.9, 29.4	12	14.8	7.0, 22.6	1.45	0.485
Product claims to have no artificial flavours	29	64.4	50.2, 78.7	53	47.7	38.4, 57.1	40	49.4	38.4, 60.4	3.79	0.150
Product claims to have no artificial colours	10	22.2	9.9, 34.6	32	28.8	20.3, 37.3	40	49.4	38.4, 60.4	12.50	0.002
Product claims to have no preservatives	18	40.0	25.5, 54.5	33	29.7	21.1, 38.3	47	58.0	47.2, 68.9	15.50	<0.001
Product claims to be a source of whole grains	16	35.6	21.3, 49.8	34	30.6	22.0, 39.3	15	18.5	10.0, 27.1	5.30	0.071
Product claims to be a source of essential nutrients	8	17.8	6.4, 29.1	32	28.8	20.3, 37.3	13	16.0	8.0, 24.1	5.08	0.079
Product claims to be made with real fruit/yoghurt/etc.	17	37.8	23.4, 52.2	29	26.1	17.9, 34.4	3	3.7	0.0, 7.9	24.26	<0.001

*The χ^2 test was used to assess differences between groups. P values <0.05 were considered statistically significant for all tests.

Table 3 The difference in nutritional content by issuing body of front-of-package nutritional claims in a survey of packaged baby and toddler foods (*n* 240) in nine grocery, drug and department stores, Philadelphia, PA, USA, October 2010

Nutritional content	No symbol			Symbol issued by the manufacturer			Symbol issued by government or health professionals			χ^2 †	<i>P</i> value
	Median*	Range		Median	Range		Median	Range			
Calories†/serving§	70	20–160		80	20–180		80	15–190		2.48	0.289
Fat/serving (g)	1.5	0–8		1.5	0–9		1.5	0–7		1.18	0.554
Na/serving (g)	35	0–470		40	0–370		30	0–120		2.09	0.353
Carbohydrates/serving (g)	6	1–25		13	0–36		13	2–28		8.71	0.013
Fibre/serving (g)	0	0–3		1	0–6		2	0–5		13.66	0.001
Sugar/serving (g)	2	0–14		5	0–20		3	0–24		11.32	0.004
	<i>n</i>	%	95 % CI	<i>n</i>	%	95 % CI	<i>n</i>	%	95 % CI		
%DV of vitamin All											
≤5 % (a little)	33	73.3	60.2, 86.5	62	55.9	46.5, 65.2	34	42.0	31.1, 52.8	13.16	0.011
6–14 % (a moderate amount)	2	4.4	0.0, 10.6	8	7.2	2.3, 12.1	12	14.8	7.0, 22.6		
≥15 % (a lot)	10	22.2	9.9, 34.6	41	36.9	27.9, 46.0	35	43.2	32.3, 54.1		
%DV of vitamin C											
≤5 % (a little)	43	95.6	89.4, 100.0	88	79.3	71.7, 86.9	46	56.8	45.9, 67.7	28.73	<0.001
6–14 % (a moderate amount)	0	0	–	3	2.7	0.0, 5.7	11	13.6	6.0, 21.1		
≥15 % (a lot)	2	4.4	0.0, 10.6	20	18.0	10.8, 25.2	24	29.6	19.6, 39.7		
%DV of vitamin E											
≤5 % (a little)	40	88.9	79.6, 98.2	79	71.2	62.7, 79.7	79	97.5	94.1, 100.0	25.79	<0.001
6–14 % (a moderate amount)	5	11.1	1.8, 20.4	26	23.4	15.5, 31.4	1	1.2	0.0, 3.7		
≥15 % (a lot)	0	0	–	6	5.4	1.2, 9.7	1	1.2	0.0, 3.7		
%DV of Ca											
≤5 % (a little)	23	51.1	36.3, 66.0	74	66.7	8.1, 31.9	46	56.8	45.9, 67.7	16.44	0.002
6–14 % (a moderate amount)	9	20.0	8.1, 31.9	30	27.0	18.7, 35.4	16	19.8	11.0, 28.5		
≥15 % (a lot)	13	28.9	15.4, 42.4	7	6.3	1.7, 10.9	19	23.5	14.1, 32.8		
%DV of Fe											
≤5 % (a little)	13	28.9	15.4, 42.4	52	46.8	37.5, 56.2	49	60.5	49.7, 71.3	20.00	0.001
6–14 % (a moderate amount)	27	60.0	45.5, 74.5	35	31.5	22.8, 40.3	19	23.5	14.1, 32.8		
≥15 % (a lot)	5	11.1	1.8, 20.4	24	21.6	13.9, 29.4	13	16.0	8.0, 24.1		
%DV of protein											
≤5 % (a little)	25	55.6	40.8, 70.3	46	41.4	32.2, 50.7	27	33.3	23.0, 43.7	14.87	0.005
6–14 % (a moderate amount)	1	2.2	0.0, 6.6	30	27.0	18.7, 35.4	21	25.9	16.3, 35.6		
≥15 % (a lot)	19	42.2	27.6, 56.9	35	31.5	22.8, 40.3	33	40.7	29.9, 51.6		
%DV of Zn											
≤5 % (a little)	25	55.6	40.8, 70.3	47	42.3	33.1, 51.6	52	64.2	53.6, 74.8	23.72	<0.001
6–14 % (a moderate amount)	13	28.9	15.4, 42.4	44	39.6	30.5, 48.8	7	8.6	2.5, 14.8		
≥15 % (a lot)	7	15.6	4.8, 26.3	20	18.0	10.8, 25.2	22	27.2	17.4, 37.0		

%DV, percentage of the daily value.

*Range refers to the minimum and maximum reported values, while the median is the middle number within this range.

†The χ^2 test was used to assess differences in categorical variables and the Kruskal–Wallis test was used to assess differences in continuous variables. *P* values <0.05 were considered statistically significant for all tests.

‡Calories = kcal; to convert to kJ, multiply kcal by 4.184.

§Serving size was determined by the product manufacturer.

||Cut-off points for each nutrient (a little (≤5 %), a moderate amount (6–14 %), a lot (≥15 %)) are based on Health Canada's guidelines for interpreting nutritional labels⁽¹⁰⁾.

used nutritional marketing tools found on children's products with high levels of fat, Na and sugar⁽⁶⁾.

Furthermore, a study that examined the content of pre-packaged children's food in Canada found that 62% of products that were deemed to be of poor nutritional quality had a front-of-package nutritional claim⁽⁴⁾. As observed in the current study, that study also showed that front-of-package nutrition claims would highlight a single area of good nutrition such as 'source of calcium' and not mention that the same product was also high in sugar⁽⁴⁾. By highlighting a single positive nutrition claim, manufacturers have developed a powerful marketing strategy that aims to alter parental consumer behaviour by providing limited information about how their products fit into a healthy diet.

The discrepancy in information found between nutritional symbols issued by the manufacturer and data found in the nutrition information panel is a concern as a study that used data from the 2003 National Assessment of Adult Literacy, which represents a nationally representative sample of US parents, found that 14.9% of parents reported they had never used a food label⁽¹¹⁾. Data from New Zealand suggest that low-income and Aboriginal residents rarely use nutrition labels as the labels are perceived to be confusing⁽⁹⁾. Another study found that college-educated women who did not take a specialized course in nutrition were more influenced by front-of-package nutrition claims than women who had taken a specialized nutrition course and were more likely to believe what was stated in the front-of-package nutrition claim, even if it was not an accurate reflection of the ingredient list⁽¹²⁾. This body of evidence indicates that simple interventions are needed to improve overall nutritional literacy at the population level. Other jurisdictions are moving in this direction: the Food Standards Agency in the UK has recommended that all packaged foods be subject to a consistent and easily understood food labelling system (red/yellow/green traffic lights) that reflects the overall nutritional content of the product⁽²⁾.

The current study is not without limitations. All food products targeted at babies/toddlers are not included in the study; this is a function of both design (i.e. some categories of food such as beverages or infant formula were purposefully excluded) and opportunity (i.e. only products sold at the nine sampled stores in Philadelphia at one point in time were eligible for inclusion). However, as all of the stores included in the study are national chains, the results may be generalizable to the rest of the USA. Additionally, nutritional information was obtained only from the nutrition information panel and the ingredient list; this may not create a complete nutrient profile of all products nor does it provide information on the role of this food item in the context of overall diet⁽¹³⁾. However, this is the only information that is easily available to the consumer at the point of purchase and, as such, is likely to be reflective of how consumers make purchasing decisions. Finally, the current study provides an overview

of what products are available in stores. It does not contain any data on how frequently these products are purchased, what proportion of babies' and toddlers' diets are comprised by these foods, or if the presence/absence of a nutritional symbol influences consumer purchasing decisions. However, the discrepancy between nutrition claims and the nutritional quality of baby food products is of important relevance because parents are more likely to purchase products with a front-of-package nutrient claim, even if the content of that claim is not substantiated by information found in the nutrition information panel⁽¹⁴⁾.

In the presence of manufacturer-issued symbols for good nutrition, whose criteria vary (and sometimes widely), consumers must be encouraged to take a more active role in reading the nutrition information panel to make accurate informed health choices when purchasing food. While legislation aimed at nutritional claims needs to weigh the importance of providing consumers with accurate information and manufacturers' ability to market their products⁽¹⁵⁾, there appears to be a disconnect between the public health goal of promoting healthy eating and nutrition labelling policy. Until legislation changes, more work is needed to develop user-friendly tools to help consumers make informed and quick decisions about what foods do and do not contribute to a healthy diet at the point of purchase.

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