

Nutrition Marketing on Food Labels

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ABSTRACT

Objective: This research sought to determine how often nutrition marketing is used on labels of foods that are high in saturated fat, sodium, and/or sugar.

Design and Setting: All items packaged with food labels (N = 56,900) in all 6 grocery stores in Grand Forks, ND were surveyed.

Main Outcome Measure(s): Marketing strategy, nutrient label information, if the product was fruit/or milk based, and target age.

Analysis: Frequency distributions were computed.

Results: Forty-nine percent of all products contained nutrition marketing and of those, 48% had both nutrition marketing and were high in saturated fat, sodium and/or sugar (11%, 17%, and 31% respectively). Seventy-one percent of products marketed to children had nutrition marketing. Of those, 59% were high in saturated fat, sodium and/or sugar content, with more than half being high in sugar. The most commonly used nutrition marketing statements were “good source of calcium”, “reduced/low/fat free”, and “food company’s health symbol”.

Conclusions and Implications: Nutrition marketing is commonly used on products high in saturated fat, sodium and/or sugar and is more often used on products marketed toward children than products marketed toward adults. Current food industry symbols may not be helping consumers select foods low in saturated fat, sodium or sugar.

Key Words: marketing, food labels, dietary fat, sodium, sugar, children (*J Nutr Educ Behav.* 2010;42:92-98.)

INTRODUCTION

Given the serious rise in obesity, and specifically childhood obesity, the practice of marketing non-nutrient-dense food to children has instigated a worldwide debate regarding legal policy and food industry responsibility. Marketing influences consumer food purchasing and consumption behavior. By influencing purchasing and consumption behavior, marketing may be a contributing factor in the obesity epidemic.

Nutrition marketing can be defined as any marketing (including marketing on television, radio, or food labels)

of food or beverages using health or nutrition information beyond minimum requirements. By this definition, a health claim would be a form of nutrition marketing. Currently the Food and Drug Administration (FDA) regulates labeling on packaged food, including the nutrition facts panel, health claims, and nutrient content claims.

Historically, television advertisements have been considered the dominant marketing strategy for food and beverage products. Although television is still considered the most common strategy, there are many other existing and emerging marketing strat-

egies, including: nutrition information on food labels; embedded marketing (eg, product placement in television shows, movies, games, magazines); viral marketing (“word of mouth”); sales promotions (eg, coupons, direct mailings, catalogs); co-branding (eg, different companies create 1 new product); cross-promotions (eg, new products introduced and sold with existing products); marketing tie-ins (eg, restaurants using movie promotional materials); premiums (eg, toys or giveaways with product purchase); on-line promotions (eg, games, targeted e-mailing); event and location marketing (eg, school, sporting events); and wireless marketing (eg, cell phones, PDAs, pagers).¹ Marketing campaigns may use many of these strategies in combination.

Although most nutrition and marketing research is focused on the impact of television advertising, nutrition marketing used on food labels may also influence consumption patterns. There has been an increase in consumption of food away from home in recent years; however, over half of

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all food dollars are spent on food consumed in the home.² Therefore, consumer grocery store purchasing patterns may have an important impact on health and obesity outcomes.

Most consumers believe that food can help prevent disease and enhance health.³ Product consumption is driven not only by product avoidance strategies, but also by health-promoting product seeking.³ Health claims can alter consumers' perceptions toward specific food products.⁴ Research has shown that products with health information on the labels influence consumer knowledge and behavior as well as company profits.⁵ An example of increased profits from nutrition marketing is Egghand's Best nutritionally enhanced egg product. Egghand's Best experienced record sales growth after introduction of their nutritionally marketed product.⁶

Increased consumer use of labeling information is related to having a higher quality diet.⁷ Although most consumers use food labels, those with higher levels of healthful eating behaviors, self-efficacy, beliefs in diet-disease linkage, and weight loss goals are more likely to use labels, whereas the majority of consumers cannot correctly interpret labeling information.⁸⁻¹³

The FDA regulates the labeling of packaged processed food. Only 1.7% of packaged processed food items are exempt from labeling requirements. The FDA allows health claims for food items that have sufficient scientific agreement linking the food to disease prevention.¹⁴ They also allow nutrient content claims such as "100% vitamin C" or "good source of protein" without evidence-based research supporting a link to disease prevention.¹⁵ In 1997, only 4% of packages contained health claims, and 39% of packages contained nutrient content claims.¹⁶ In 2000-2001, 4.4% of food packages contained health claims and 49.7% of product labels had nutrient content claims.¹⁷

Although research has not been conducted to determine how consumers differentiate between health claims and nutrient content claims and how these perceptions influence food purchasing behaviors, research in the tobacco industry has shown that consumers interpret allowed labeling claims of "no additives" to imply that the cigarettes were more healthful, less

likely to harm, and likely to be less addictive.¹⁸ Consumers may make similar extrapolations on products that contain nutrient content claims, and these extrapolations may be influencing purchasing patterns.

With the escalating obesity crisis, the possible influence of marketing (primarily on television) has increasingly been recognized as a potential factor in obesity prevention.¹⁹ There have been discussions regarding the role of the US government in regulating the food industry (advertising bans, taxation, and purchase limitations), much in the same way as was done with tobacco.²⁰⁻²² Proponents of regulation have illustrated the US government's history of regulating personal behaviors with tobacco, illegal drugs, alcohol, and sexuality.²³

The US government currently regulates marketing and the food industry. It has established criteria for nutrition labeling, use of health claims, and the use of nutrient content claims.¹⁵ However, nutrient content claims are allowed without considering the overall nutrient composition of the food product. Some food products may use nutrient claims and/or other nutrition marketing despite the product's unfavorable overall nutrient density composition. Whether nutrition marketing should be used on products with excessive amounts of saturated fat, sodium, and added sugars, which the Dietary Guidelines for Americans recommends limiting, is a question.²⁴ The practice of focusing on 1 nutrient component in marketing, possibly leading the consumer into buying a product for health benefits, when the product contains high levels of saturated fat, sodium, and/or added sugar may also be of concern.

The food industry will be a critical factor in any successful long-term, large-scale obesity prevention effort.²⁵ Many large food companies are already making significant efforts to improve the health of individuals and communities.²⁶ In a recent Institute of Medicine (IOM) report, food and beverage companies, schools, restaurant chains, the media and entertainment industry, and the US government have been encouraged to work together to promote the marketing of nutrient-dense food.¹ The Council of Better Business Bureaus and the National Advertising Review

Unit, after the release of the IOM and Federal Trade Commission/Department of Health and Human Services reports on marketing and children, revised guidelines in their *Self-Regulatory Guidelines for Children's Advertising* in an effort to prevent "unfair" advertising to children.²⁷

How often nutrition marketing is used on non-nutrient-dense products and the influence of that nutrition marketing on consumer product choice is unknown. Additionally, most current research on marketing of food products is focused on marketing through television media. Although this is an important factor to consider, research needs to be conducted to understand the influence of a variety of marketing strategies on food behavior, including the influence of food-label marketing on product choice. Specifically, it is unknown how consumers differentiate between health claims and nutrient content claims on food labels and how these claims influence food purchasing behaviors. This research question coincides with the IOM recommendation that research should address how marketing influences the food purchasing and consumption choices of children and youth.¹

Before research may be conducted that seeks to understand the influence of nutrition marketing on consumer purchasing patterns, frequency and use of nutrition marketing on food labels need to be elucidated. This research sought to determine how often nutrition marketing (health claims, nutrient content claims, or any marketing using health or nutrition information beyond minimum requirements) is used on labels of food items that are high in saturated fat, sodium, and/or sugar.

METHODS

All packaged products (N = 56,900) in all grocery stores (n = 6) in Grand Forks, ND were visually surveyed. Four grocery stores from a local grocery store chain and 2 other regional grocery store chains were included in the survey. Stores selling food and other department store items (eg, clothing), food and gas, and convenience stores were excluded from the survey.

A survey tool was developed to record nutrition marketing on grocery store products. The survey tool

included product brand name, product variations, marketing strategies, select nutrient label information, whether the product is fruit- or milk-based, target age, and shelf position. Product variations (such as the same product in different sized packaging or different flavors with less than 20-calorie difference between variations) were recorded as a total number of variations available. Marketing strategies were coded and categorized into statements of fact, structure/function claims, nutrient content claims, and/or US FDA health claims. Select nutrient label information included serving size (documented in household measurement and/or in grams), servings per package, calories, percentage total fat, percentage saturated fat, percentage sodium, grams of total carbohydrate, and grams of sugar. Any product listing milk in the first 2 ingredients or a fruit-based product with fruit/juice listed in the first 2 ingredients or containing fruit/juice above 25% was designated as fruit or milk based. Target age was defined as marketing on products being perceived to be targeting the young child (1-8 years), preteen (9-12 years), teen (13-18 years), or all. Shelf position on products targeted to children was defined to 3 possible levels: hip level and lower (less than 35 inches), between hips and nose (36-56 inches), nose level or higher (more than 56 inches). Target age and shelf position were recorded on children's products only. Products were perceived to be marketed toward children if the label included *child-oriented* graphics (ie, ABC lettering), characters (ie, cartoon or celebrities), toys or prizes, contests or sweepstakes, coupons or rebates, or special-order items.

A set of coding instructions and a list of marketing strategies were developed by the principal investigator and supervising dietitian to govern a team of 8 dietary personnel (working in teams of 2) who visited all 6 grocery stores. Permission to visit each grocery store and record information was obtained from each store manager. A total of 56,900 food products were recorded at the 6 stores.

The food label nutrition facts panel includes percentage daily values (DVs) for consumer use. DVs are derived from daily reference values (DRVs) and reference daily intakes (RDIs) and are based on a daily intake of

2,000 calories. DVs allow consumers to assess the nutrition content of specific nutrients in the packaged food items in relationship to their overall daily intake of that nutrient. The FDA uses an established value of $\geq 20\%$ DV per serving of a specific nutrient as indication that the product contains "high" amounts of that nutrient. The percentage DV for saturated fat and sodium are established based on a recommendation of consuming less than 20 g of saturated fat and 2,400 mg sodium per day.²⁸ If a product contained $\geq 20\%$ DV saturated fat or $\geq 2,400$ mg sodium it was considered high in the respective nutrient.

At the time of this research, there was no DV established for sugar. High sugar content was operationally defined by the principal investigator and a team of 5 United States Department of Agriculture (USDA) research dietitians, who were consulted specifically for the development of this operational definition. The team consulted with the FDA and the USDA's Center for Nutrition Policy Promotion (CNPP) to evaluate current policy. The Dietary Guidelines provide the example (based on a 2,000-calorie diet, with 267 discretionary calories, 29% of calories from total fat, and no alcohol consumed) of ≤ 32 g of added sugar per day.²⁴ If the product was not fruit or milk based, ≥ 6 g sugar (20% of 32 grams) was operationally defined as high in sugar. If the product was fruit or milk based, ≥ 21 g sugar (15 g per serving of milk or fruit plus 6 g additional sugar) was operationally defined as high in sugar.

All grocery store products were categorized into 22 food groups. Guidelines for defining groups were developed by a USDA research database dietitian and approved by the principal investigator for use. The groupings were based on the Food Group Description File from the USDA Nutrient Database for Standard Reference.²⁹ All coding was checked several times for accuracy, as well as compared between stores for uniformity. The food groups included dairy and egg products; spices and herbs; baby food; fats and oils; poultry products; soups, sauces, and oils; sausages and luncheon meats; breakfast cereals; fruit and fruit juices; pork products; vegetables and vegetable products; nut and seed products; beef

products; finfish and shellfish products; legume and legume products; lamb, veal, and game products; baked products; sweets; grains and pastas; meals, entrées, and side dishes; and snacks.

Statistical Methods

Inter- and intrarater reliability were estimated using 15 food items selected by a research dietitian to represent a variety of food groups. On 3 separate days, each of the 4 2-person teams recorded label and product information for each of the 15 food items. Each team worked independently from the other teams. Recording days were separated by 5 or 7 days during which no recording occurred. Inter- and intrarater reliability coefficients were calculated by using the Mixed procedure in SAS (version 9.1, SAS Institute, Cary, NC, 2003) and specifying team or day as the repeated measure, respectively.³⁰ Interrater reliability for nutrient content claims, health claims, statements of fact, structure/function claims, and whether food items were marketed toward children were 0.82, 0.93, 0.78, 0.88, and 0.85, respectively. Intrarater reliability for nutrient content claims, health claims, statements of fact, structure/function claims, and whether food items were marketed toward children were 0.93, 0.93, 1.0, and 1.0, respectively.

Frequency distributions were computed for individual label claims, for the claim categories for all food items and for those items marketed toward children, and for label claims for all food groups.

RESULTS

There were 110 different nutrition marketing strategies coded within the 4 nutrition marketing categories, with a total of 83,108 separate incidences of nutrition marketing observed. For products marketed to children, there were 78 different nutrition marketing strategies coded within the 4 nutrition marketing categories, with a total of 18,737 separate incidences of nutrition marketing observed.

Of the 56,900 food labels surveyed, 49% of all products contained nutrition marketing. Of those products, 48% had nutrition marketing and were high in saturated fat, sodium,

Table 1. Percentage of All Products Containing Nutrition Marketing and $\geq 20\%$ Saturated Fat, Sodium, or Sugar

Percentage of Products Containing:	Overall	Products with $\geq 20\%$ Saturated Fat, Sodium, and/or Sugar		Products with $\geq 20\%$ Saturated Fat	Products with $\geq 20\%$ Sodium	Products with $\geq 20\%$ Sugar
Nutrition marketing	49.0	48.1		11.1	16.9	31.01
<i>Of products containing nutrition marketing, percentage of products containing:</i>						
Health claims	8.6	8.2		2.0	5.2	9.9
Nutrient content claims	75.7	73.3		56.3	64.6	76.9
Statements of fact	67.1	68.8		72.7	71.7	68.1
Structure/Function claims	5.8	7.5		1.7	3.9	9.6

and/or sugar (11%, 17%, and 31%, respectively) (Table 1). Therefore, 23% of all products both contained nutrition marketing and were high in saturated fat, sodium, and/or sugar.

Only 9% of nutrition marketing on products involved an FDA-regulated health claim. Seventy-six percent of products with nutrition marketing involved nutrient content claims. Six percent of products with nutrition marketing had structure/function claims on the label. The majority (67%) of products with nutrition marketing did not use a regulated health claim, nutrient content claim, or structure/function claim; instead, they used some other nutrition or health information on the label that may be considered a statement of fact.

Of 9,105 products perceived to be marketed to children, 71% had nutrition marketing (Table 2). Seventy-two percent of products marketed to children that did not use nutrition marketing were high in saturated fat, sodium, and/or sugar (25%, 20%, and 51%, respectively). Of products marketed to children with nutrition marketing on the label, 59% were high in saturated fat, sodium, and/or

sugar (13%, 13%, and 49%, respectively). Therefore, 42% of all products marketed to children both contained nutrition marketing and were high in saturated fat, sodium, and/or sugar, and 63% of all products marketed to children are high in saturated fat, sodium, and/or sugar.

Overall, the most commonly used nutrition marketing statements (in order of frequency) were: "good source of calcium," "reduced-fat/low-fat/fat-free," "food company's health symbol," "made with real . . .," and "reduced/low/trans fat-free." On products high in saturated fat, the most commonly used nutrition marketing statements (in order of frequency) were: "made with real . . .," "food company's health symbol," "good source of calcium," "reduced/low/trans fat-free," and "natural." On products high in sodium, the most commonly used marketing statements (in order of frequency) were: "food company's health symbol," "good source of calcium," "made with real . . .," "reduced/low/trans fat-free," and "good source of protein." On products high in sugar, the most commonly used marketing statements (in order of frequency) were: "good source of cal-

cium," "good source of vitamins and minerals," "food company's health symbol," "contains whole grains," and "reduced-fat/low-fat/fat-free" (Table 3).

Meals, entrées, and side dishes were most likely to have nutrition marketing and be high in saturated fat and sodium for products marketed to both adults and children. Beverages (not including juice containing $>25\%$ fruit) were the most likely food group to contain nutrition marketing and be high in sugar for products marketed to both adults and children (Table 4).

DISCUSSION

Nutrition marketing is frequently used on food labels of products marketed toward children. Thirty-three percent of the nutrition marketing on products targeting children cannot be categorized as either the FDA-regulated health claim or nutrient-content claim. Nutrition marketing is used more frequently on products targeted to children than products targeted to an adult audience (71% vs 49%, respectively). Products targeted

Table 2. Percentage of Children's Products That Contain Nutrition Marketing and $\geq 20\%$ Saturated Fat, Sodium, or Sugar

Percentage of Products Containing:	Overall	Products with $\geq 20\%$ Saturated Fat, Sodium, and/or Sugar		Products with $\geq 20\%$ Saturated Fat	Products with $\geq 20\%$ Sodium	Products with $\geq 20\%$ Sugar
Nutrition marketing	71.0	58.6		13.4	13.5	48.95
<i>Of products containing nutrition marketing, percentage of products containing:</i>						
Health claims	5.8	5.7		0.0	0.0	6.84
Nutrient content claims	78.2	71.5		55.5	64.1	76.00
Statements of fact	65.9	68.3		69.0	77.0	66.19
Structure/Function claims	7.5	8.6		0.7	3.1	10.06

Table 3. Nutrition Marketing on All Products and on Products Containing \geq 20% Saturated Fat, Sodium, or Sugar

	Nutrition Marketing Statement	% Using Marketing Approach	Marketing Category
Overall top 5 nutrition marketing approaches used on all products	Reduced-fat, low-fat, or fat-free	8.7	Nutrient-content claim
	Food company's symbol	5.7	Statements of fact
	All-natural	5.7	Statements of fact
	Reduced, low, or trans fat-free	5.6	Nutrient-content claim
	Lower calories	5.0	Nutrient-content claim
All products \geq 20% saturated fat	Good source of calcium	14.8	Nutrient-content claim
	Food company's symbol	13.0	Statements of fact
	Made with real . . .	12.6	Statements of fact
	All-natural	11.6	Statements of fact
	Reduced, low, or trans fat-free	9.4	Nutrient-content claim
All products \geq 20% sodium	Reduced-fat, low-fat, or fat-free	10.7	Nutrient-content claim
	Reduced, low, or trans fat-free	8.3	Nutrient-content claim
	Food company's symbol	8.0	Statements of fact
	No preservatives	7.0	Statements of fact
	Made with real . . .	6.5	Statements of fact
All products \geq 20% sugar	Reduced-fat, low-fat, or fat-free	6.8	Nutrient-content claim
	Good source of calcium	6.6	Nutrient-content claim
	All-natural	5.6	Statements of fact
	Food company's symbol	4.9	Statements of fact
	Good source of vitamin C	4.6	Nutrient-content claim
Overall top 5 nutrition marketing approaches used on children's products	Good source of calcium	7.6	Nutrient-content claim
	Reduced-fat, low-fat, or fat-free	7.3	Nutrient-content claim
	Food company's symbol	7.2	Statements of fact
	Made with real . . .	6.9	Statements of fact
	Reduced, low or trans fat-free	6.8	Nutrient-content claim
Children's products \geq 20% saturated fat	Made with real . . .	17.2	
	Food company's symbol	16.1	Statements of fact
	Good source of calcium	15.6	Nutrient-content claim
	Reduced, low, or trans fat-free	13.8	Nutrient-content claim
	All-natural	5.8	Statements of fact
Children's products \geq 20% sodium	Food company's symbol	16.3	Statements of fact
	Good source of calcium	15.7	Nutrient-content claim
	Made with real . . .	11.1	Statements of fact
	Reduced, low, or trans fat-free	8.1	Nutrient-content claim
	Good source of protein	7.4	Nutrient-content claim
Children's products \geq 20% sugar	Good source of calcium	9.6	Nutrient-content claim
	Good source of vitamins and minerals	7.8	Nutrient-content claim
	Food company's symbol	7.1	Statements of fact
	Contains whole grains	6.5	Statements of fact
	Reduced-fat, low-fat, or fat-free	6.3	Nutrient-content claim

to children using nutrition marketing are more often high in saturated fat, sodium, and/or sugar than products marketed with nutrition marketing targeted to adults. Whether consumers are selecting products high in saturated fat, sodium, and sugar with nutrition marketing on the label because they believe the food items are a more healthful selection than comparable food items without nutrition marketing or if they can

critically analyze the overall nutrient composition of the product is unknown.

There is evidence indicating the effectiveness of health symbols on food labels in changing consumer purchasing behavior. The National Heart Foundation of New Zealand developed a symbol (a check mark called a "tick") for food labels indicating that products meet specific nutrient criteria. The "Pick the Tick" campaign

resulted in many food companies reformulating their food products to meet requirements, and 59% of shoppers reported using the symbol to make food purchasing selections.³¹ Although many US food companies and related organizations are making great efforts to improve the health of our nation's children and prevent obesity, the use of symbols by US food companies to identify a product as a healthful selection was one of

Table 4. Nutrition Marketing on Food Groups Containing \geq 20% Saturated Fat, Sodium, or Sugar

	Food Groups	% of All Food Items
Overall top 5 food groups that contain nutrition marketing and are high in saturated fat, sodium, and/or sugar	Meals, entrées, and side dishes	20.0
	Beverages	11.9
	Sweets	11.3
	Dairy and egg products	9.0
	Fruit and fruit juices	8.5
Top 5 food groups that contain \geq 20% saturated fat and contain nutrition marketing	Meals, entrées, and side dishes	40.7
	Dairy and egg products	24.4
	Sweets	18.7
	Snacks	5.1
	Baked products	4.1
Top 5 food groups that contain \geq 20% sodium that contain nutrition marketing	Meals, entrées, and side dishes	54.8
	Soups, sauces, and gravies	19.1
	Sausages and luncheon meats	6.4
	Vegetables and vegetable products	4.4
	Legumes and legume products	3.4
Top 5 food groups that contain \geq 20% sugar that contain nutrition marketing	Beverages	18.3
	Sweets	14.2
	Fruit and fruit juices	13.1
	Baked products	11.1
	Breakfast cereals	10.9
Overall top 5 food groups that contain nutrition marketing on children's products and are high in saturated fat, sodium, and/or sugar	Meals, entrées, and side dishes	22.0
	Beverages	20.5
	Breakfast cereals	14.9
	Baked products	14.0
	Sweets	13.8
Top 5 food groups that contain \geq 20% saturated fat and contain nutrition marketing on children's products	Meals, entrées, and side dishes	64.6
	Sweets	19.7
	Snacks	5.4
	Dairy and egg products	4.5
	Baked products	3.7
Top 5 food groups that contain \geq 20% sodium and contain nutrition marketing on children's products	Meals, entrées, and side dishes	92.9
	Baked products	3.2
	Poultry products	0.9
	Sausages and luncheon meats	0.9
	Snacks	0.6
Top 5 food groups that contain \geq 20% sugar and contain nutrition marketing on children's products	Beverages	24.6
	Breakfast cereals	17.9
	Baked products	16.4
	Sweets	15.0
	Meals, entrées, and side dishes	11.0

the top 5 marketing strategies seen on products high in saturated fat, sodium, and/or sugar that were marketed to children.

Although this research systematically evaluated a large number of products, there are limitations that need to be considered. This research operationally defined added sugar. Although a team of 5 USDA research dietitians (3 of whom hold doctorates) worked with the principal investigator and consulted other federal agencies, the operational definition was subjective. However,

when this operational definition was compared to the United Kingdom's Food Standard Agency's definitions of high added sugar (15 g per 100 g of product) via application of both definitions to a sample of representative products (containing grams of sugar on the label), this operational definition used conservative cutoff values. An additional limitation of this research is the subjective nature of classifying products as targeting children. To control for this potential limitation, researchers established specific guidelines to

evaluate target age marketing on products, conducted group and individual training on assessing target age, supervised data collection, and conducted inter-/intrarater reliability testing which included assessment of target age to ensure that the protocols were being applied correctly and consistently between and within groups. Interrater reliability for whether food items were marketed toward children was 0.85, and intrarater reliability for whether food items were marketed toward children was 1.0.

IMPLICATIONS FOR RESEARCH AND PRACTICE

The results of this research indicate that practitioners need to be aware of the marketing strategies commonly used in grocery store environments. Practitioners can work with people to increase awareness of marketing strategies. Additionally, practitioners can help people interpret and assess marketing messages within the overall nutrient profile of food items. Future research needs to examine the influence of nutrition marketing on consumer product selection. Additionally, future research needs to examine the possible interaction between the influence of television marketing and Internet promotions targeting children, which result in changes in children's preferences in grocery stores and parents' interpretation of healthfulness of the child's desired product. In other words, if the child sees an ad on TV and wants the product, when they ask for the product in the grocery store, is the parent more likely to purchase the product if nutrition marketing is included on the front label. If an interaction exists, this may be important finding because children view over 40,000 commercials per year; half of those commercials advertise high-calorie, low-nutrient food items, and less than 3% advertise nutrient-dense food options.³²

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REFERENCES

- McGinnis JM, Gootman JA, Kraak VI, eds. *Food Marketing to Children and Youth: Threat or Opportunity?* Washington, DC: National Academy of Sciences, Institute of Medicine (US) Committee on Food Marketing and the Diets of Children and Youth; 2006.
- Blisard N. Food spending by US households grew steadily in the 1990s. *Food Review*. 2000;23:18-22.
- Gilbert LC. The functional food trend: what's next and what Americans think about eggs. *J Am Coll Nutr*. 2000;19(5 Suppl):507S-512S.
- Bech-Larsen T, Grunert KG. The perceived healthiness of functional foods. A conjoint study of Danish, Finnish and American consumers' perception of functional foods. *Appetite*. 2003;40:9-14.
- Freimuth VS, Hammond SL, Stein JA. Health advertising: prevention for profit. *Am J Public Health*. 1988;78:557-561.
- Michella SM, Slaugh BT. Producing and marketing a specialty egg. *Poult Sci*. 2000;79:975-976.
- Kreuter MW, Brennan LK, Scharff DP, Lukwago SN. Do nutrition label readers eat healthier diets? Behavioral correlates of adults' use of food labels. *Am J Prev Med*. 1997;13:277-283.
- Satia JA, Galanko JA, Neuhouser ML. Food nutrition label use is associated with demographic, behavioral, and psychosocial factors and dietary intake among African Americans in North Carolina. *J Am Diet Assoc*. 2005;105:392-402; discussion 402-393.
- Cowburn G, Stockley L. Consumer understanding and use of nutrition labeling: a systematic review. *Public Health Nutr*. 2005;8:21-28.
- Levy L, Patterson RE, Kristal AR, Li SS. How well do consumers understand percentage daily value on food labels? *Am J Health Promot*. 2000;14:157-160, ii.
- Reid DJ, Hendricks SM. Consumer understanding and use of fat and cholesterol information on food labels. *Can J Public Health*. 1994;85:334-337.
- Fullmer S, Geiger CJ, Parent CR. Consumers' knowledge, understanding, and attitudes toward health claims on food labels. *J Am Diet Assoc*. 1991;91:166-171.
- Pelletier AL, Chang WW, Delzell Jr. JE, McCall JW. Patients' understanding and use of snack food package nutrition labels. *J Am Board Fam Pract*. 2004;17:319-323.
- Rowlands JC, Hoadley JE. FDA perspectives on health claims for food labels. *Toxicology*. 2006;221:35-43.
- Katan MB, de Roos NM. Public health. Toward evidence-based health claims for foods. *Science*. 10 2003;299:206-207.
- Brecher SJ, Bender MM, Wilkening VL, McCabe NM, Anderson EM. Status of nutrition labeling, health claims, and nutrient content claims for processed foods: 1997 Food Label and Package Survey. *J Am Diet Assoc*. 2000;100:1057-1062.
- Legault L, Brandt MB, McCabe N, Adler C, Brown AM, Brecher S. 2000-2001 food label and package survey: an update on prevalence of nutrition labeling and claims on processed, packaged foods. *J Am Diet Assoc*. 2004;104:952-958.
- Arnett JJ. Winston's "No Additives" campaign: "straight up-no bull"? *Public Health Rep*. 1999;114:522-527.
- Morrill AC, Chinn CD. The obesity epidemic in the United States. *J Public Health Policy*. 2004;25:353-366.
- Davey RC. The obesity epidemic: too much food for thought? *Br J Sports Med*. 2004;38:360-363; discussion 363.
- Hayne CL, Moran PA, Ford MM. Regulating environments to reduce obesity. *J Public Health Policy*. 2004;25:391-407.
- Kelley B. To quell obesity, who should regulate food marketing to children? *Global Health*. 2005;1:9.
- Kersh R, Morone J. The politics of obesity: seven steps to government action. *Health Aff (Millwood)*. 2002;21:142-153.
- Dietary Guidelines for Americans 2005*. Washington, DC: US Department of Health and Human Services and US Department of Agriculture; 2005.
- Seidell JC. Prevention of obesity: the role of the food industry. *Nutr Metab Cardiovasc Dis*. Feb 1999;9:45-50.
- Short D. When science met the consumer: the role of industry. *Am J Clin Nutr*. 2005;82(1 Suppl):256S-258S.
- Council CsAR. *Self-Regulatory Program for Children's Advertising*. New York, NY; 2006.
- Guidance for Industry: A Food Labeling Guide*. College Park, MD: US Food and Drug Administration; 2008.
- USDA National Nutrient Database for Standard Reference. Washington, DC: US Department of Agriculture; 2006. <http://www.nal.usda.gov/fnic/foodcomp/search/>. Accessed December 15, 2009.
- Winer BJ. *Statistical Principles in Experimental Design*. 2nd ed. New York, NY: McGraw-Hill Book Co.; 1971:283-296.
- Young L, Swinburn B. Impact of the Pick the Tick food information programme on the salt content of food in New Zealand. *Health Promot Int*. 2002;17:13-19.
- Gantz w, Schwartz N, Angelini JR, Rideout V. *Food for Thought: Television Food Advertising to Children in the United States*. Henry J. Kaiser Family Foundation Report. March 2007.