Health and Nutrient Claims in Processed Food Products: Are Consumers Gaining or Losing?

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Over the past decade consumers' knowledge of the relationship between select foods and a healthy lifestyle and/or disease reduction has increased significantly. Over that same time period, food companies have substantially increased their use of health messaging claims on their packaging (Caswell et al. 2003; Parker 2003). As the number of health messaging claims and products has increased, so has the wariness of the consumers regarding product efficacy (Datamonitor 2009; Garretson and Burton 2000). Governments support the inclusion of claims on food products to facilitate nutrition education to consumers and to provide the food industry with an incentive for reformulation and development of new innovative products (Health Canada 2007). Food companies use these health messaging claims to inform consumers of product features and increase sales (Brandt, Moss, and Ferguson 2009; Caswell et al. 2003; Herath, Henson, and Cranfield 2008). Consumers use these claims to make decisions that support healthy food choices. When making these decisions, consumers generally assume that the claim is valid (e.g., a low-fat claim implies lower fat grams) and that the other nutritional attributes (e.g., levels of sugar and fiber) for the product remain the same or improve, implying an overall healthier product. If instead there is a pattern of incongruence between claims and nutrient levels (e.g., low-fat products consistently provide higher salt), this is of concern to consumers, as the meaningfulness of these claims may be diluted and consumers may be obtaining unintended levels of nutrients. In other words, consumers may be purchasing products with a health messaging claim that provides a gain related to the nutrient associated with the claim but a loss due to decreased good nutrients or increased poor nutrients that are not associated with the claim (Colby et al. 2010). Government policy makers should also be concerned if a pattern of incongruence is prevalent in processed food products as this could imply that current health messaging regulations may not be assisting consumers to make informed choices and construct healthier diets (Nestle and Ludwig 2010).

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Objective

This research examines the relationship between the presence of a health messaging claim and the amount of key nutrients (i.e., amount of fat, saturated fat, sodium, sugar, protein, and fiber) found in a processed food product, excluding the nutrient associated with the claim. The specific purpose of this research is to determine if incongruence between nutrient levels and claim types are prevalent in processed food products.

Methodology

A field study was conducted at a grocery store in the Vancouver, Canada metropolitan area. The nutrition levels and health messaging claims from over 400 packages of cookies, crackers, and breakfast cereal processed food products were coded in database format. Health messaging claims found on the food products were categorized into the claim categories of fat, fiber, saturated fat, sugar, sodium, whole grains, ingredient, natural, check-off, and no claim. Products were categorized into the three product categories of cookies, crackers, and breakfast cereals. Each product's nutrition content of total fat, saturated fat, sodium, sugar, protein, and fiber were recalculated on a per calorie basis (e.g., fat grams per calorie or sodium milligrams per calorie). The difference between these calculated values and the Canadian Food Inspection Agency recommended daily intake (RDI) (also in units per one calorie) was calculated for each nutrient to obtain a relative difference in the nutrient content. This relative difference in the nutrient content (dependent variable) is regressed using OLS on a set of dummy variables that represent each of the health messaging claims (independent variables) and product categories

(independent variables), allowing a testing of the following hypotheses: Given a specific health messaging claim (e.g., fat-related, sodium, sugar, fiber, checkoff, ingredient, natural, or whole grain), ignoring the nutrient directly associated with the claim, the levels of all or some of the negative attribute items (sodium, saturated fat, total fat, and/or sugar) remain the same or decrease and the levels or all or some of the positive attribute items (protein and fiber) remain the same or increase. Rejection of the null hypothesis implies the meaningfulness of the claim to the consumer is diluted and that the consumer's nutritional gains from using the processed food product with a claim (e.g., a low-fat claim provides low fat nutrient) is offset by a nutritional loss due to higher unwanted nutrition attributes (e.g., a low-fat claim provides higher sodium). A separate regression was conducted with each nutrient—fat, saturated fat, sodium, sugar, protein, and fiber—as the dependent variable and using the health messaging claims and the product categories as independent variables.

Descriptive Statistics

The majority of the processed food products had some type of health messaging claim. The percentages of products with health messaging claims are presented in Table 1. Trans fat-, saturated fat-, and ingredient-related health messaging claims were found most often in these processed food products. Sugar- and sodium-related health messaging claims were found least often in these processed food products. Nineteen percent of the products had no claims at all (Table 1).

On average, the levels of fat, sodium, and protein nutrients were below RDI values (e.g., negative values), while the levels of saturated fat, sugar, and fiber nutrients were above the RDI values (e.g., positive values) in the processed food products surveyed. The value of the mean deviation of each nutrient is presented in Table 2. Because consumers generally want to decrease the fat and sodium in their diets, having these nutrient levels below the RDI is considered good. However, the negative value for protein is seen as poor, as consumers generally want to increase this nutrient in their diets. In addition, the positive values for saturated fats and sugar are seen as poor, as consumers generally strive to minimize these nutrients in their diets, while the positive value for fiber is viewed as good, as this is a nutrient that consumers generally want to increase in their diets.

Results

The analysis reveals a number of interesting and significant relationships between levels of fat, saturated fat, sugar, sodium, protein, and fiber and health messaging claims. The estimated results from the linear model are presented in Table 3. The estimated coefficients for fat, saturated fat, sugar, protein, and fiber are provided in a gram-per-calorie unit, while sodium is provided on a milligram-per-calorie basis; these units need to be kept in mind when reviewing the results. For example, the level of sodium is 0.207 milligrams per calorie more when a fat claim is made, which implies that a 100-calorie serving of a processed food product contains 21 milligrams more sodium when a fat health messaging claim is made.

Results indicate that the null hypothesis can be rejected in a number of cases. Specifically, the presence of specific health messaging claims in some cases has a negative impact on key nutrient levels in that all or some of sodium, saturated fat, total fat and/or sugar increases and/or protein and/or fiber decreases when a claim is present. For example, Rows 6 and 9 of Table 3 shows that sodium and sugar levels are greater when a fat-related health messaging claim is made. Rows 2 and 14 indicate that total fat levels are higher and fiber levels are lower when a sodium-related health messaging claim is made. Row 7 indicates that sodium levels are higher when a check-off health messaging claim is made. Rows 4, 10, 12, and 16 indicate that saturated fat and sugar levels are higher and fiber and protein levels are lower when an ingredient-related health messaging claim is made. Finally, Row 13 shows that the fiber level is lower when a saturated-fat claim is made.

Conclusions and Future Research

A field study was conducted at a grocery store in Vancouver, Canada to collect nutrition levels and health messaging claims from select processed food packages with the objective of reviewing the relationship between a specific health messaging claim and the level of select negative and positive attribute

Table 1. Percentage of Processed Food Products Surveyed with Select Health Messaging Claims.

Health messaging claims	Processed food products with the claim (%)
Fat [1]	21
Trans fat [2]	54
Saturated fat [2]	36
Fiber [2]	31
Ingredient [3]	45
Sugar [2]	2
Sodium [2]	8
Whole grains [4]	29
Natural [2]	20
Check-off [5]	23
No claim on package	19

1. Includes claims such as low-fat, fat-free, and % less fat.
2. Includes claims that specifically mention the trans fat, saturated fat, fiber, sugar, sodium, or natural.
3. Includes claims related to ingredients such as peanut-free, goodness of real fruit, made with real lemon, and wheat-free.
4. Includes claims that specifically mention whole grains of various varieties.
5. Includes all company and third-party–sponsored health-related endorsements in the form of logo, graphic, or text.

Table 2. Mean Deviation of Nutrient Content.

Nutrient	Mean deviation [1]
Fat [2]	–13.78
Sodium [2]	–5.12
Saturated fat [2]	14.25
Sugar [2]	186.65
Fiber [3]	29.29
Protein [3]	–66.46

1. Mean deviation is defined as the difference between the amount of the nutrient found in the product and the RDI, expressed as a percentage of the RDI
2. Fat, sodium, saturated fat, and sugar are nutrients that consumers generally want to decrease, and thus a positive value (content above RDI) for these nutrients is viewed as poor, while negative values (content below RDI) are viewed as good.
3. Fiber and protein are nutrients that consumers generally want to increase, and thus a negative value (content below RDI) for these nutrients is viewed as poor, while a positive value (content above RDI) is viewed as good.

Table 3. Significant Regression Estimates for Nutrients with Health Messaging Claims.

	Estimated coefficients [1]	t Stat
Total fat with (Adjusted $R^2 = 0.499$)		
Sodium claim	0.00425	1.64 [2]
Saturated fat with (Adjusted $R^2 = 0.454$)		
Ingredient claim	0.00175	2.06 [3]
Sodium with (Adjusted $R^2 = 0.418$)		
Fat claim	0.207	2.43 [2]
Check-off claim	0.240	2.64 [4]
Sugar with (Adjusted $R^2 = 0.596$)		
Fat claim	0.00564	1.76 [2]
Ingredient claim	0.00528	2.19 [3]
Fiber with (Adjusted $R^2 = 0.458$)		
Ingredient claim	–0.00450	–2.99 [3]
Saturated-fat claim	–0.00394	–1.95 [3]
Sodium claim	–0.00611	–2.18 [3]
Protein with (Adjusted $R^2 = 0.400$)		
Ingredient claim	–0.00210	–2.44 [3]

1. Positive coefficients indicate more of the nutrient is in the product when the claim is made, while negative coefficients indicate that less of the nutrient is in the product when the claim is made.
2. Denotes statistical significance at the ten percent level .
3. Denotes statistical significance at the five percent level.
4. Denotes statistical significance at the one percent level.

nutrients other than the claim nutrient. This study demonstrates that the presence of specific health messaging claims in some cases has a negative impact on key nutrient levels in that all or some of sodium, saturated fat, total fat, and/or sugar increases and/or protein and/or fiber decreases when a claim is present. Future research should focus on expanding product categories, variety of health messaging claims, and nutrient types to review the strength of these relationships in a broader context.

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