

The Effect of Positive and Negative Nutrition/Health Advertising Label Claims on Intention to Buy

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Abstract

This study aims to determine which of the benefits and attributes expressed as the front of the package claims can have the greatest impact on consumers' willingness to buy milk and to understand the role of stating these in either a positive or negative fashion. Focus groups were conducted throughout the U.S. to identify attributes and benefits most and least important for fluid milk purchase. This information was used in a discrete choice experiment. Over 2,000 respondents were recruited from MTurk nationally and asked to complete the survey online. The quantitative results show that negative attributes and benefits are most important. However, producing GMO-free or rBST-free milk is more expensive and may not be cost-effective in a declining market.

Keywords: labeling, discrete choice experiment, focus groups, GMO, fluid milk, health claims

JEL Classification: L66; L81; M31; M37

Introduction

This research aims to examine the impact that positively stated nutrition/health claims on the front of packages (e.g., builds strong bones) and negatively stated label claims (e.g., no antibiotics) have on consumer likelihood to buy. The product used for this analysis is fluid milk, as it is ubiquitous and can be associated with a significant number of positively and negatively stated product claims. This document is more than a report on a single research study, but rather harmonized research results from the secondary, qualitative, and quantitative analysis. The qualitative analysis included focus groups with fluid milk users, and the quantitative analysis is based on discrete choice experiments. This study aims to determine which of the benefits and attributes expressed as front of the package claims can have the greatest impact on consumers' willingness to buy milk and to understand the role of stating these in either a positive or negative fashion.

Background

Nancarrow et al. (1998) state that effectiveness in labeling would help consumers, as the Financial Times suggests, to choose "between rows and rows of almost identical products." Since advertising business is expensive, the knowledge gained about the psychology of their consumers is important to assist manufacturers to understand the "how" and "whys" of consumer responses to their packs and advertisements. Effective labeling on the packaging would underpin the main forms of marketing communications of advertising, personal selling, publicity, public relations, direct marketing, and sponsorships (Nancarrow et al., 1998).

In-store marketing captures shoppers' attention and increases impulse buying (Inman et al., 2009). Impulse buys are 40 to 80 percent of all purchases and account for approximately 50 percent of grocery sales (Kossman, 2021). Impulse buying varies by category and online vs. brick-and-mortar (Nielsen, 2017). Online grocery has higher impulse buying than brick-and-mortar, but the reverse is true for frozen food. The label on the packaging provides a company with the final opportunity to persuade prospective buyers before purchase. Shoppers, as they pass down the aisles, are "exposed" to packages just as they are to any other forms of promotion (Kotler and Armstrong, 2021).

Current consumers, market trends, and numerous academic researchers suggest a growing role for product packaging, which includes labeling, as a brand communication vehicle (Holmes and Paswan, 2012; Kotler and Armstrong, 2021; Prendergast and Pitt, 1996; Underwood et al., 2001; Wells et al., 2007; Vergura and Luceri, 2018). When consumers pay attention to nutrition and health claims on food products, sales are estimated to increase by 10 to 20 percent (Aschemann-Witzel and Hamm, 2010). A meta-analysis found 20 of 31 studies with health-related claims increase purchasing and/or consumption (Kaur, Scarborough, and Rayner, 2017). Health claims may dramatically increase sales: chocolate's positive effects on cardiovascular disease and diabetes increased sales by 49 percent in three years (Tufts University Health & Nutrition Letter, 2007), while scientific evidence is refuting the medicinal benefit of St. John's Wort to treat depression reduced sales from \$400 to \$59 million in four years (Saldanha, 2007). Nutritional claims on packages have been shown to be positively related to a firm's stock performance and sales (Cao and Yan, 2016). Nutrition and health claims provide differentiation opportunities (Verbeke, Scholderer, and Lahteenmaki, 2009).

There are three main sources of nutrition claims on packages: i) nutrition information panel (NIP); ii) front-of-package labels (FOP); and iii) health claims (Talati et al., 2016). The NIP is on the back or side and details nutritional information and usually nutrient's recommended daily intake and serving percentages. FOPs provided condensed information on multiple nutrients. Research indicates that consumers rely on FOP to make decisions, especially for food (Bublitz, Peracchio, and Block, 2010; Wansink and Chandon, 2006).

Andre, Chandon, and Haws (2019) categorize FOP claims as nature vs. science or presence vs. absence of attributes resulting in four combinations. Natural is unaltered or the "absence of human intervention" (p. 176), and science means improvement through human intervention by science. They applied its categorization to breakfast cereals because cereals make a "wide range of FOP claims," are frequently purchased, and have poor nutritional value (p. 173). Their results indicate that these contrasts explain most healthy food claims in the category. Most cereals make one claim and "seldom mix claims from different categories" (p. 180). They found that this affects health too. "Claims based on nature were rated as healthier and less tasty than claims based on science" (p. 186). "Claims based on the presence or positive attributes (e.g., high antioxidants," "wholesome," "organic" were rated as both healthier and tastier than those based on the absence of a negative attribute" (p. 186). They speculate that consumers believe healthy means removing something from food and results in healthy food being perceived as tasting worse.

Nutritional claims may include: i) content (presence or absence); ii) health (benefit of nutrient); and iii) combined (links nutrient and disease prevention) (Talati et al., 2016). A study of 80 million food and beverage purchases in the U.S. found 13 percent of food and 35 percent of beverages had low-content claims (Tallie, et al., 2017). Shorter claims were better than longer ones. Health-based claims explicitly link diseases and nutrients (Mitra et al., 1999), activate more general claims in memory (Andrews et al., 1998), for example, low cholesterol versus lowersus lowers risk of heart disease. Claims linked to disease-related health benefits are preferred to "softer" psychological-based claims such as stress relief or increased energy (van Kleef et al., 2005). Health-based claims can favorably affect product attitudes and purchase intentions; however, stronger effects were found through nutrition facts panels on packages (Kozup et al., 2003). A review of breakfast cereal and prepared meal products in the U.S. over a four-year period found that a number of claim types were not good indicators of healthy (Schaefer, Hooker, and Stanton, 2015).

Nutrient-content claims (e.g., no transfat) have decreased slightly in the marketplace, while healthy-based claims (e.g., lower fat reduces the risk of high blood pressure) have increased, although the latter is still rare (Caswell et al., 2003). Nutrient-content claims can be classified as specific or general. Consumers more easily understand specific claims (e.g., no transfat) than general claims (healthy)

(Andrews et al., 1998). The labels were most effective when nutrient-content claims and content labels were used (Miklavec et al., 2015).

Nutrition health claims on the front of packages are one of the factors that make packaging a more effective marketing tactic, especially for food products. These claims are potentially powerful tools in consumer communication as they convey information on food characteristics (e.g., “contains calcium”) and health-related food benefits (e.g., “contributes to a heart-healthy diet”) that might otherwise remain unknown to the consumer (Parker, 2003; Reboucas et al., 2017). As such, nutrition and health claims may influence consumer preference and facilitate well-informed food choices (Ippolito and Mathios, 1993). Its effect may be influenced by whether processing is system 1 (thinking quickly and automatically) or 2 (thinking slowly and deliberately) (Sanjari, Jahn, and Boztug, 2017).

Three potential biases with nutritional claims exist where consumers rate the product: i) better merely because of the claim (positivity); ii) on unrelated attributes (halo); and iii) where consumers attribute inappropriate health benefits (magic bullet) (Andrews et al., 2000; Andrews et al., 1998; Chandon and Wansink, 2007; Mayer and Scammon, 1993; Roe, Levy, and Derby, 1999). In general, “health claims on foods are seen by consumers as useful and when a product features a health claim they view it as healthier and state that they are more likely to purchase it” (Williams, 2005, p. 260). Consumers may not use the information appropriately. Low-fat claims have led to underestimating calories (Wansink and Chandon, 2006). Health claims have been criticized because they focus on the positive and may induce a positivity bias (Gorton et al., 2010; Saba et al., 2010), induce more consumption (Faulker et al., 2014), or reduce the likelihood of viewing the NIP. Many unhealthy children’s snacks have nutrition claims such as “made from fruit juice” (Wirtz, Ahn, Song, and Wang, 2013). Health claims endorsed by third parties have increased purchase intentions (Bennett and McCrohan, 1993). Merely having health claims on the product label may inflate its importance (Brown and Carpenter, 2000). Packaging has been shown to influence taste and preference (Robinson and Matheson, 2007). Using FOP visuals and verbal claims, one study found that “parents were also easily led to believe the product was healthier based on visuals of fruit, more realistic pictures, health claims, cross-branding with healthier foods, and visuals suggesting the product is more natural” (Abrams, Evans, and Duff, 2015, p. 20). Taste can be positively influenced by taste claims (Bialkova, Sasse, and Fenko, 2016). Nutrient-content claims were evaluated as healthier but less tasty than taste claims which were perceived as less healthy (Choi, Paek, and King, 2012).

Fluid Milk Market

Per capita, fluid milk consumption declined from 2010 to 2020 (U.S. Department of Agriculture, 2020). The cause of the decrease has been attributed to various reasons from economic pressure and price increases to consumer desires, changing demographics, and ineffective advertising. More Americans are dieting than a decade ago (The Associated Press, 2020). The largest competitor to fluid milk comes not exclusively from other dairy farmers but non-dairy milk options and other popular beverages presented on the market, such as soda, soy beverages, sports drinks, smart water, tea, juice, etc. Per capita cheese consumption (Cheddar, Colby, washed curd, stirred curd, Monterey, and Jack) has increased annually since 2010 (U.S. Department of Agriculture, 2021). Fluid milk was chosen to study because it is declining in sales, it has a large household penetration rate, and is purchased mostly in retail stores where packaging’s influence on purchase is growing, and impulse buys are prevalent. Finally, it is associated with a significant number of positively and negatively stated product claims.

Demographics are equally important. Households with children are key consumers of milk. According to U.S. Census Bureau data, the rate of households with children under 18 has been steadily declining: 40 percent of all households in 2020 from 56 percent in 1970 (United States Census Bureau, 2020). Even more significant is that the size of the Hispanic population is growing. This would not be an issue if the milk industry targeted the Hispanic market; very few milk processors have taken that step. The Hispanic population has grown from almost 10 million in 1970 to nearly 61 million in 2019 (Noe-Bustamante, Lopez, and Krogstad, 2020). This population was chosen because the American Hispanic population is growing, and few competitors are targeting them. Historically, children consume more fluid milk than adults (Hayden and Fred Kuchler, 2022).

Methodology

The study is a three-step research process and includes an extensive secondary research study (comprehensive literature overview of the importance of packaging, labeling, and front-of-package nutrition health claims, regulatory overview, and consumer behavior, and attitudes toward milk) conducted to identify previous research on milk label claims. The secondary research objective was to verify the critical areas in current research to include in future research studies.

The second step was qualitative research, which included consumer focus groups to discuss the attributes and benefits most or least important to consumers in a qualitative setting. Focus groups were held in two U.S. cities with various demographic groups. The Denver focus groups consisted of mothers with children under the age of 18 living in the household and another with millennials. In Baltimore, there were again mothers with children under the age of 18 living in the households and Hispanics.

At the end of the focus groups, consumers were presented with the index cards exercise that involved the free sorting technique (Bech-Larsen and Nielsen, 1999). Respondents were given index cards with various attributes and benefits of fluid milk to identify their important benefits sought from milk (after a discussion of all benefits including “made without the use of artificial hormones,” i.e., aided): “made without the use of artificial hormones” was the eighth attribute listed in the group of important attributes while the most common attribute on the label and “made without the use of toxic pesticides” was the top-rated by consumers using the index card methods and top even on the list of attributes actually included.

The third step was a quantitative survey of consumers using Discrete Choice Experimentation (DCE) using logit analysis to measure the extent to which the previously identified attributes and benefits were important in the purchase decision. Attributes were ascertained from the focus groups (besides taken from the open discussion, an index card technique was used to rank potential attributes), the secondary research, and the Mintel GNPD. An incomplete block design was used utilizing a fractional factorial where the 40 milk labels were separated into 13 choice sets consisting of four milk label profiles per set.

These surveys used DCE to examine relative weights for nutrition claims that enhance willingness to buy milk. DCE has been widely used in marketing to evaluate consumer preferences for products and services (Silayoi and Speece, 2004) and as a type of experimental design, was found to be a very effective method used in the food industry to evaluate package design (and its different elements), to measure consumer preferences on the importance of packaging attributes and to optimize new products (Gofman and Moskowitz, 2012; Hollywood et al., 2013; Moskowitz, 2012; Silayoi and Speece, 2004). The data was collected using an online questionnaire which included:

- (1) Screener: to ensure the participants were in the correct age range (from 18 years old), were the primary shopper in the household, and had purchased fluid milk in the past three months;
- (2) Discrete choice experiment (DCE): including an open-ended question on messages and/or benefits on the milk label that influence their purchase decision to discover respondents’ perception in unaided situation; and two sets of milk label profiles to quantify how much importance consumers place on different front-of-package attributes and claims;
- (3) Milk purchase behavior questions: to learn about milk purchase behavior of the respondents (i.e., frequency of milk purchases, average consumption of the milk, at which types of stores milk is usually purchased, organic and private label milk usage, and the types of milk preferred); and
- (4) Socio-demographic questions: to provide a better description of the respondents regarding various socio-demographic groups, such as size of the household, presence of the children under 18, marital status, education, income, education, employment status, income, state residence, race, and origin.

Mechanical Turk

Amazon Mechanical Turk (MTurk) was used to perform the email broadcast of the questionnaire. MTurk offers the ability to recruit large and diverse samples, quick survey completion, cost efficiency, and better quality than undergraduate students (Miller et al., 2017). A study comparing MTurk to samples from: students, Qualtrics, and panel providers (Kees et al., 2017) and found MTurk superior to the panel surveys and comparable to the student samples. Mortensen and Hughes (2018) found that “the vast majority of the studies supported the use of MTurk for a

variety of academic purposes.” Compared to Craigslist, Facebook, and Google Ads, MTurk and Craigslist were more cost-efficient, and respondents were more committed but less demographically diverse than Facebook and Google Ads (Antoun et al., 2016).¹ A criticism of MTurk is the same respondents complete surveys for different topics. Using a “capture-recapture” technique, one study estimated that 26 percent of workers retired and 36 percent completed a survey for one of seven laboratories recruiting respondents, and each lab can reach 7,300 workers (Stewart et al., 2015). MTurk has been shown to have good reliability and validity for self-reported data for socially unacceptable behavior (Kim and Hodgins, 2017). Another study found a large proportion of imposters when using self-reported screeners (Wessling, Huber, and Netzer, 2017).

Kacey Culliney in his article “Out with the bad, in with the good: Consumers seek positive nutrition” discusses the findings of Packaged Facts research (Culliney, 2013) and says that consumers are seeking more positive attributes in their food, particularly with positive nutrition, as opposed to claims that indicate removing negative ingredients, which are still important. David Sprinkle, director of Package Facts, said a look at the restaurant sector (which is really a precursor to industry claims) reveals a clear trend toward positive food claims, like high in fiber, and they are gaining traction in place of reduced fat or low calories.

A Mintel report on “Beverage Packaging Trends” (Mintel, February 2014) indicates that displaying claims on positive packaging traits, such as being “a good source” could further encourage the idea of health attributes, instead of “low” or “no” claims, which may suggest something was taken away. More than a third of all respondents look for beverage packaging that stated being “a good source.”

Additionally, Mintel report on “Food Packaging Trends” (Mintel, July 2014) shows that parents are significantly more likely than the average consumer to look for food claims that discuss positive nutritional attributes of food products, e.g., “good source of vitamins, fiber, calcium, etc.,” then the absence of negative nutritional attributes. However, parents pay about average attention to claims of “low or no” and functional health claims. Therefore, it is concluded: “food brands will want to position products as supportive of overall health rather than claiming to have little or none of a specific ingredient that may be considered unhealthy” (Mintel, July 2014). Prior research shows that “claims based on the presence or positive attributes (e.g., high antioxidants,” “wholesome,” “organic” were rated as both healthier and tastier than those based on the absence of a negative attribute” (Andre, Chandon, and Haws, 2019, p. 186).

Presence of negative or free-form labels

Free-form labels or negative attributes indicate the absence of an ingredient. Consumers may misinterpret these labels: appropriate for only certain consumers, unpalatable, or a healthier option (Siegrist and Keller, 2011). Consumers have misperceptions about GMOs (Siegrist, Hartmann, and Sutterlin, 2016). Consumers believe GMO-free food products to have slightly higher nutritional values (Loureiro and Hine, 2002), and pay more for them (Lusk, Jamal, Kurlander, Roucan, and Taulman, 2005). In a study comparing free-form labels to identical products without labels, the former was viewed as healthier (Hartmann et al., 2018).

Hypotheses

Below are our hypotheses for fluid milk, and below that is our justification for the hypotheses.

H₀₁: Positive attributes/benefits are more frequently mentioned in an unaided recall than negative claims.

H₀₂: Positive attributes/benefits expressed on the FOP have a greater impact on consumers’ willingness to buy.

H₀₃: When the same claim exists on the label in both the positive and negative wording form, the impact of the positive claim outweighs the impact of the negative on consumers’ willingness to buy.

H₀₄: Placing a negative statement on the label decreases the overall perception of the product category.

Results

Findings: Secondary data analysis (GNPD)

Using GNPD², of the 73 new milk products introduced from January 2013 to May 2014, there were 65 new milk products (89%) to examine what claims were actually made on new milk products.³ While consumers may have

² GNPD is the Global New Product Database that monitors product innovation and retail success in consumer-packaged goods markets worldwide <http://www.gnpd.com/sinatra/home/>

³ 7 products had no claims on the label

varying responses to claims on milk labels, the GNPD data shows what the industry must believe motivates consumers to buy. The number one claim used on milk labels among 35 different claims used in the same period was “hormone-free,” and it was the result of the new milk product claim’s analysis are shown in Table 1. This result can be compared to the consumer response to the potential milk claims.

TABLE 1: Frequency of front-of-package claims on new milk labels

#	Front-of-Pack Claim	Frequency, count	Frequency, %
1	Hormone-free (including rBST-free etc.)	65	89.04
2	Total*fat	62	84.93
3	Kosher	58	79.45
4	Organic	32	43.84
5	Vitamin/mineral fortified	32	43.84
6	Total*allergen	25	34.25
7	Ethical - environmentally friendly product	21	28.77
8	Ethical – animal	19	26.03
9	Total*lactose claims	18	24.66
10	No additives/preservatives	17	23.29
11	Functional – other	14	19.18
12	Ethical - environmentally friendly package	11	15.07
13	Functional – bone health	11	15.07
14	GMO-free	11	15.07
15	Gluten-free	11	15.07
16	Halal	11	15.07
17	Functional – cardiovascular	6	8.22
18	High protein	6	8.22
19	Functional – brain and nervous system	5	6.85
20	Total*sugar	5	6.85
21	Economy	5	6.85
22	Limited edition	5	6.85
23	On-the-go	4	5.48
24	Ethical – human	4	5.48
25	All-natural product	3	4.11
26	Total* cholesterol	2	2.74
27	Stanols/sterols	2	2.74
28	Premium	2	2.74
29	Vegetarian	2	2.74
30	Convenient packaging	1	1.37
31	Children (5-12)	1	1.37
32	Total*calorie	1	1.37
33	Total*sodium	1	1.37
34	Total*saturated Fat	1	1.37
35	Added calcium	1	1.37

These claims can be classified by prior research. Among the top five front-of-package claims on new milk labels, and using the classification of Andre, Chandon, and Haws (2019), two are scientific (hormone-free; vitamin/minerals fortified) and three natural (total*fat; Kosher, and organic) and one includes the absence (hormone-free and total fat) and two the presence (Kosher, organic and vitamin/mineral fortified).

Findings: qualitative research

Free sorting Technique (Index Card Exercise)

Note: The positive attributes (“excellent source of vitamin D” and “good source of protein”) had more mentions than the “made without the use of artificial hormones” attribute; and “excellent source of calcium” had the same number of mentions as the “made without the use of artificial hormones” attribute (see Table 2).

TABLE 2: Important attributes (Index cards exercise)

Rank	Claim	Frequency of mentions, count
1	Made without the use of toxic-persistent pesticides	28
2	All-natural	24
3	No artificial ingredients	24
4	From cows not treated with antibiotics	23
5	Excellent source of vitamin D	23

6	Good source of protein	23
7	Guaranteed fresh	22
8	Made without the use of artificial hormones	22
9	Excellent source of calcium	22
10	The protein and potassium in milk helps maintain strong muscles	20

Participants were asked to pick their top three claims out of the important attributes and benefits that have picked before: “made without the use of artificial hormones” was the seventh attribute listed in the group of the top important ones. Taste, freshness, organic, all-natural and quality had more mentions than the “made without the use of artificial hormones” attribute (see Table 3), which was the attribute with the highest frequency of attributes on new products.

TABLE 3: Top three the most important attributes (Index cards exercise)

Rank	Claim	Frequency of mentions, count
1	Tastes great	9
2	Guaranteed fresh	8
3	Organic	8
4	Made without the use of toxic-persistent pesticides	6
5	All-natural	6
6	Highest quality guaranteed	6
7	Made without the use of artificial hormones	5
8	From pasture-raised cows	5
9	No artificial ingredients	4
10	The calcium and vitamin D in milk helps build strong bones	4

Unaided milk benefits question

To compare the results of an aided response to important attributes/benefits to an unaided response, respondents were asked in an open-ended format which message they remembered on the milk label or signage at the dairy case that influenced their decision to purchase the type/brand of milk before any questions about milk attributes/benefits were asked. The results are shown in Table 4. It is important to note that the first recalled (top of mind) attribute/benefit that is negative number 7 hormone-free (6.3% of the mentions; 13.7% for vitamin content), number 14 no artificial ingredients and rBST (1% mentions for both). Regarding unaided top of mind, the positive claims far outweigh negative claims. The difference between vitamins and hormone mentions in top-of-mind mentions using Two-Proportion Z-test was statistically significant with (Z-score=7.8, p-value=.000).

TABLE 4: Percentage of mentions in unaided open-ended question on milk benefits

Rank #	Word	Frequency, count	Frequency, %
1	Price	359	17.8
2	Fat	334	16.6
3	Vitamin	275	13.7
4	Organic	242	12.0
5	Calcium	170	8.4
6	Date	170	8.4
7	Hormone	127	6.3
8	Sale	97	4.8
9	Local	74	3.7
10	Healthy/health	40	2.0
11	Vitamin D	35	1.7
12	Fortified	29	1.4
13	Protein	26	1.3
14	Artificial	21	1.0
15	RBST	20	1.0
16	Antibiotic	17	0.8
17	GMO	10	0.5
18	Grass fed	9	0.4
19	Pesticide	0	0.0

Discrete choice experiment (DCE)

DCE was performed to determine the benefits and attributes expressed as FOP claims, which can be displayed on a milk label that would have the greatest impact on consumers' willingness to buy milk by forcing consumers to trade

off some attributes to get other attributes. The attributes and levels for this step were developed based on the secondary research and focus groups as shown in Table 5. There were 2,011 respondents used for the final data analysis for the study. The average time of survey completion was 6 minutes and 49 seconds. The average time of DCE completion was 53.25 seconds per set.

TABLE 5: Attributes and levels used in DCE

#	Attribute	Level 1	Level 2	Level 3	Level 4	Level 5
1	Nutrient Content	Good source of protein	Excellent source of vitamin D	Excellent source of calcium	Good source of potassium	-
2	Structure/Function	The protein and potassium in milk help maintain strong muscles	The calcium and vitamin D in milk helps build strong bones	The vitamin B12 in milk helps maintain the body's red blood cells	-	-
3	Health	Adequate calcium and vitamin D throughout life, as part of a well-balanced diet, may reduce the risk of osteoporosis	Diets low in sodium may reduce the risk of high blood pressure, a disease associated with many factors	-	-	-
4	Negative	Our farmers pledge not to use artificial growth hormones	Made without the use of toxic pesticides	GMO-free	From cows not treated with antibiotics	No artificial ingredients
5	Production	Organic	All-natural	Produced locally	-	-
6	Quality/Freshness	Highest quality guaranteed	Guaranteed fresh	-	-	-
7	Sustainability	From grass-fed cows	Sustainably raised	Supports local farmers	-	-
8	Taste	Tastes great	Taste from your childhood	-	-	-

The ordered relative importance of factors (attributes) tested is shown in Table 6. Factors with greater relative importance play a more significant role in encouraging buying milk than those with smaller importance.

TABLE 6: Relative importance of milk claims

Rank	Claim	Utility
1	From cows not treated with antibiotics	88.12
2	No artificial ingredients	79.91
3	Our farmers pledge not to use artificial growth hormones	78.47
4	GMO-free	73.62
5	Made without the use of toxic pesticides	72.59
6	From grass-fed cows	43.76
7	Excellent source of vitamin D	40.27
8	Support local farmers	38.76
9	Excellence source of calcium	37.94
10	Sustainably raised	36.56
11	Good source of protein	35.84
12	Organic	24.05
13	Produced locally	23.58
14	Good source of potassium	23.17
15	Highest quality guaranteed	23.14
16	All natural	17.51
17	The calcium and vitamin D	14.62
18	Guaranteed fresh	13.93
19	The protein and potassium	13.42
20	Adequate calcium and vitamin D	10.85
21	The vitamin B12	7.54

An example of the structure of the DCE labels is shown in Appendix 1.

Aided versus unaided milk claims importance

The label attribute in the DCE of “from cows not treated with antibiotics” was the most effective; however, the word antibiotic appeared in only .8 percent of unaided influences by the same respondents who rated the labels. Thus, the label claim was far more prevalent than the frequency that consumers mentioned it. The second most effective attribute in the DCE study was “no artificial ingredients,” but had only 1 percent of the word appeared in the unaided influences. The third most was “our farmers pledge not to use hormones;” however, the word hormone appeared in 6.2 percent of the unaided influences. rBST was mentioned by name in the unaided influences in 1 percent of the mentions. The fourth most effective attribute was “GMO-free,” and that had only .5 percent of the mentions in the unaided influences by the same respondents who rated the labels. The fifth most effective attribute in the DCE was “made without the use of toxic pesticides,” and there were 0 (none) mentions in the unaided influences by the same respondents who rated the conjoint labels. The sixth most effective attribute in the DCE was “grass-fed cows,” and the word grass was mentioned .4 percent in the unaided influences by the same respondents who rated the labels.

Effect of negative claims on the product category

An issue has existed as to whether making negative claims on a label for a specific company or brand creates an unwanted sense of concern among consumers. For example, when general foods placed a “no GMO” claim on just a few products, e.g., Cheerios, what effect did that have on all the other brands that were not labeled “no GMO?”

In the case of fluid milk, one can look at U.S. Department of Agriculture data to see that fluid milk sales have been declining. The question with respect to negatives is to look at how the negative slope has changed during the introduction of a negative claim. For this example with fluid milk, the authors used “no rBST” as the negative claim.

Hypothesis Testing

H₀₁: Positive attributes/benefits are more frequently mentioned in an unaided situation than negative claims.

The index card method used in the quantitative part of the qualitative part of this study indicates that when considering just what was important the top attribute was the negative attribute “made without the use of toxic persistent pesticides” (see Table 3). However, when respondents were asked to pick the three most important claims, with the highest picks being “tastes great,” “guaranteed fresh,” and “organic.”

However, taste, freshness, organic, all-natural and quality all positive claims had the highest number of respondents consider them the most important had more mentions than the “made without the use of artificial hormones” attribute. Additionally, using an unaided top-of-mind process in the quantitative part, the positive concepts were the most frequently mentioned in terms of being important to the consumer (see Table 3). The most frequently mentioned negative concept was hormone-free, but that was number seven on the list overridden by vitamin, organic, calcium, etc. It appears as if based on the unaided importance in top-of-mind studies one can accept the hypothesis that positive attributes/benefits are more frequently mentioned in an unaided situation than negative claims

H₀₂: Positive attributes/benefits expressed on the FOP have the greater impact on consumers’ willingness to buy.

The results of the discrete choice experiment show that negative claims, in general, were much more effective than the positive attributes regarding affecting the likelihood to buy (see Table 6). Although the evidence is contradictory, one is not in the position to accept the hypothesis that positive attributes/benefits expressed on the FOP have the greater impact on consumers’ willingness to buy. Hypothesis two is rejected.

H₀₃: When the same claim exists on the label in both the positive and negative wording form, the impact of the positive claim outweighs the impact of the negative on consumers’ willingness to buy

The issue concerning hypothesis three is whether the most influential aspect of the attribute is the use of a negative term or the actual attribute itself. In Table 6, the same concept is expressed twice. The negative expression is “no artificial ingredients,” while the positive expression is “all-natural.” While the authors agree there may be some individual interpretation, it is generally accepted that all-natural suggests no artificial ingredients. As shown in Table 6, the negative expression is significantly more highly rated by consumers than the positive expression. One can conclude that it is the negative expression and not the benefit or attribute that has the impact on the consumer. Hypothesis three is rejected.

H₀₄: Placing a negative statement on the label decreases the overall perception of the product category.

One can see in Table 6, that when the negative claims dominate the positive claims when they are added to the label claims. The positive traits drop significantly in utility value in forming preference. Ironically, making the dairy more desirable by including positive claims is lost when negatives are added to the label. Hypothesis four is accepted.

Conclusions

Consumers want to identify healthy food choices and may use labels to partially achieve this (Zhang, Carlton, and Lo, 2016). Our results confirm prior research that nutrition claims can alter sales (Aschemann-Witzel and Hamm, 2010; Cao and Yan, 2016; Saldanha, 2007; Tufts University Health & Nutrition Letter, 2007b). It appears that there is a paradox emanating from the results of this study. Not all label claims have the same impact on willingness to buy and for some consumers may actually have the opposite effect. The paradox is while consumers in an unaided research environment do not overwhelmingly mention negative claims, most mentioned, the positive aspects of dairy, and discrete choice experiments indicated that the negative attributes and benefits dominated significantly the positive attributes and benefits. This does contradict other findings about positive packaging traits and claims are better than negative (Mintel, February and July, 2014). It does support prior research showing that free-form labels and identical products without the labels, the free-form was more positive (Hartmann et al., 2018). It provides conflicting support that consumers perceived GMO foods as better (Loureiro and Hine, 2002). GMO was high in the discrete choice model but low in front-of-pack claim and unaided recall.

One might argue that consumers really do not care about these negative attributes and benefits, but when it is positioned on the label, it increases their awareness, and they respond more to those negative claims. However, it would be naïve to assume consumers do not find negative claims important, because we live in an age and world where labels announce both the positive and negative attributes of the products.

The issue related to how deeply or significantly consumers hold these negative claims to be important can be resolved somewhat by the willingness to pay analysis. It appears as if for rather small amounts of money, consumers are willing to shift from the rBST-free for a lower price. As would be expected, there was a portion of the consumer population that would not change under any circumstance. Most likely, these people are driving the dairy industry to make the negative claims on the label attractive to the 10 percent or so people who are truly committed to these types of foods.

However, this does not imply that dairy processors should jump on to the negative claims such as GMO-free or rBST-free or no antibiotics. It appears from the data presented that while consumers may react to negative claims, it also seems to set a negative perception of the entire category. This may be extremely important. In the process of using negative claims and attracting an audience who values those claims you may also be sensitizing others in a non-desired way. For example, when you put “no antibiotics” on chicken labels, those who value that claim may be more likely to buy that brand or product. However, you are raising the awareness level of all those who may not have originally cared or thought about this issue. If it is more profitable to sell “no antibiotics” chicken, good, but generally that is not the case.

One can use the orange juice (OJ) example. Researchers discovered that consumers wanted augmented OJ like “heart healthy” OJ. The product was put on the shelf and did not sell when priced higher than regular OJ. While consumers wanted the added value of “heart health,” they did not want to pay for it. When the OJ alternatives were all priced the same, the augmented ones sold more. Of course, the augmented cost more to make, and it was less profitable. This moved consumers from a high-profit product to a lesser profitable one.

There is also a very basic business issue to conclude from this analysis. It is quite obvious that the cost of producing GMO-free or rBST-free milk is more expensive than normally produced milk, and since category sales are declining, it would be expected that total dairy revenues would similarly be declining.

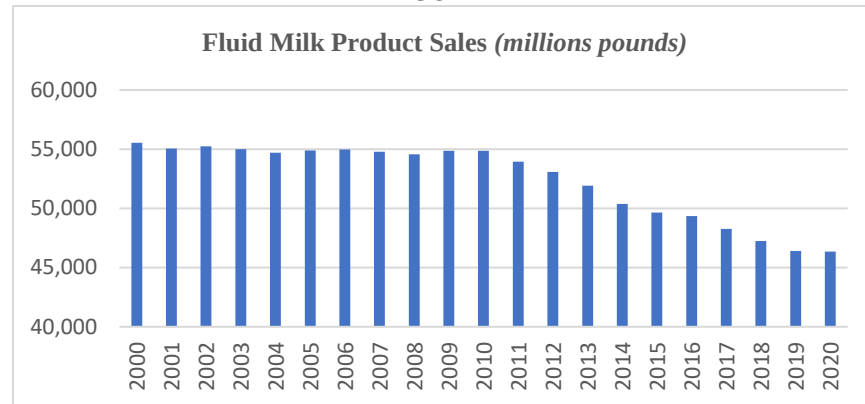
There is also an experimental conclusion. Two different levels of primary research were performed for this project. The qualitative research was numerous focus groups in different parts of the country, and the quantitative was a nationwide online survey. The results differed significantly and dramatized the need to have a thorough examination of the data from various views. This type of research is like a Rubik’s cube. Each type of research, (secondary, qualitative, and quantitative) provided a partial solution, just like getting one side of the cube, but it is not until you have completed all three types of research does the full solution reveal itself, just like the completed cube!

Future Research and Limitations

Future research should examine whether these nutritional claims would better be expressed in evaluative FOPs (Goodman et al., 2012; Graham, Heidrick, and Hodgins, 2015; Hawley et al., 2013; Hersey et al., 2013; McLean et al., 2012; Sacks et al., 2009; Smith-Edge et al., 2014; Talati et al., 2016). Manipulating processing, system 1 or 2, could influence results (Sanjari, Jahn, and Boztug, 2017). Would the healthier label influence taste (Bialkova, Sasse, and Fenko, 2016; Andre, Chandon, and Haws, 2019)?

Limitations include the respondent, halo effects, and stimuli. We cannot guarantee respondents did not bypass the screeners just to make money for survey completion (Wessling, Huber, and Netzer, 2017). Could a halo effect have occurred (Chandon and Wansink, 2007; Andrews et al., 2000; Roe, Levy, and Derby, 1999; Andrews et al., 1998; Mayer and Scammon, 1993; Williams, 2005)? Stimuli were limited to visuals and text-based. Prior research has indicated that consumers want more FOP information, and ours was limited (Edge, Toner, Kapsak, and Geiger, 2014). Finally, the results were from a controlled experiment making external validity low.

FIGURE 1



Appendix 1

In this question, you'll be asked to choose between only two labels.

Suppose you are doing your regular grocery shopping in the store. Suppose you are going to buy a gallon container of 2% Reduced Fat Milk. You get to the dairy case and see there are two 2% Reduced Fat Milk products available for sale. Both products are available at the same price, have the same expiration date, the same amount of milk and the same kind of plastic container. The products are the same in all other respects except one is labeled "Our farmers pledge not to use artificial growth hormones" and the other is not.

Below there are two labels of the milk available, please select the one you would be most likely to choose assuming these were the only options available by placing a mark in the box next to the answer choice.

If you would not purchase milk (or would delay your purchase) assuming these were the only options available, check the box provided the last ("If these were the only options available, I would choose none of them")



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