

Effects of Health Information on Product Labels: Consumer Attitudes and Buying Intention for Functional Foods

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Abstract: Functional food has become a topic of increasing importance for the food industry over the past decade, despite the lack of a legal definition by FDA. The main characteristic of a functional food that distinguishes it from conventional food that consumers can be considered to be a credence attribute of product quality. This characteristic may only be observed in the long term and cannot be easily assessed by consumers even after consumption. This results in an imperfect information environment for health benefits. Producers have full knowledge while consumers do not. Hence, the government controls the provision of health claims on product labels to avoid such market failures. The objective of this study is to examine the effect of such health claims on consumer attitudes and behavior. It also determines whether different message contents and source credibility are important factors that influence consumers' purchasing decisions. Computer-based assessments of consumer behavior toward a hypothetical food product are conducted using 146 undergraduate students from The Ohio State University. The study applies a 2x2 between-subjects factorial design manipulating claim type and endorsement. Motivation and ability to process health information, perception of product attributes, health and disease knowledge, and disease risk/concerns are measured. Results indicate that consumers use health-related information in the process of decision making when purchasing food products. Endorsement by health organizations tends to increase the credibility of health messages. Individual characteristics such as the motivation to process and use health information, as well as the perception of other product attributes such as taste and price, also influenced consumer attitudes and buying intention.

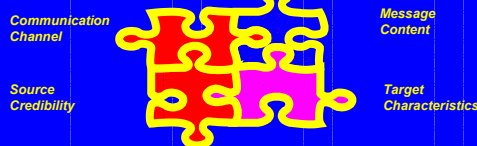
Objective

The objective of this study is to examine how health information with multiple claims can influence consumer's attitudes and purchasing decisions for functional foods

- > Do consumers react differently to a claim that explicitly states the health benefit of the product as compared to a claim that provides information about the functional/ phyto-chemical content?
- > Does a claim that is endorsed by health organizations receive more positive responses?
- > To what extent does the use of health information vary across individuals?

Theoretical Framework

The effect of information on changes in consumer behavior depends on four factors, following the message-learning approach



- 1. Communication channel:** This study focuses on how consumers react to information provided on food product labels
- 2. Message content:** Phyto-chemical content claim using terms "good source", "high", or "low". Health claim characterizes the relationship between phytochemical and disease
- 3. Source credibility:** Endorsement by perceived credible sources such as the government or health organizations may resolve consumer skepticism about information provided by food producers
- 4. Target characteristics:** Individual's motivation and ability to process information, perception of product attributes, concerns and risks of developing diseases

Table 1: Descriptive Statistics for Explanatory Variables

Question Descriptions	Mean	Std Dev
Individual Characteristic (3 Items 7-Point Scales)		
Motivation (3 Items 7-point scales) I am interested in looking for information about the health benefits of the tomato juice product. In the future, I intend to pay more attention to information about tomato juice while shopping.	3.461	1.578
Ability (3 Items 7-point scales) How easy was it to understand the health information on the FRONT LABEL of the tomato juice product? How confident are you about your ability to use the information on the FRONT LABEL when making food choices?	4.895	1.124
Product Attributes (7-Point Scales)		
Taste Compared to traditional tomato juice products, tomato juice (containing soy protein) will TASTE BETTER.	2.842	1.422
Short Run Benefit HEALTH BENEFITS THAT CAN BE OBSERVED IN THE NEXT THREE MONTHS.	4.068	1.465
Long Run Benefit HEALTH BENEFITS THAT CAN BE OBSERVED IN SEVERAL YEARS.	4.932	1.342
Price Compared to traditional tomato juice products, tomato juice (containing soy protein) will BE MORE EXPENSIVE.	5.205	1.307
Diet and Disease Knowledge (7-Point Scales)		
Prostate Scientific studies have shown that LYCOPENE may be good for your health. LYCOPENE is found in tomato products. Based on your knowledge, LYCOPENE may reduce the risk of (1 = Prostate cancer and 0 otherwise)	0.329	0.471
Heart Scientific studies have shown that SOY PROTEIN may be good for your health. ISOFLAVONES are found in soy product. Based on your knowledge, ISOFLAVONES may reduce the risk of (1 = Heart disease and 0 otherwise)	0.404	0.492
General knowledge Relative to other college students, how knowledgeable do you feel you are about the way your diet can help reduce the risk of diseases? Correct answers on diet-disease relationships (6 questions)	4.377	1.415
Hquiz Correct answers on diet-disease relationships (6 questions)	1.938	1.187
Previous Consumption (6-Point Scales)		
Tomato Juice How frequently do you consume tomato juice?	1.568	0.989
Soy Products How frequently do you consume products containing soy protein?	2.226	1.548
Concern Related to Diseases (7-Point Scales)		
Maintain good health To what extent are you interested in using food to MAINTAIN GOOD HEALTH?	5.559	1.088
Prevent Disease To what extent are you interested in using food to PREVENT DISEASES?	5.527	1.261
Prostate Cancer - Self How concerned are you about PROSTATE CANCER for yourself?	3.321	2.161
Prostate Cancer - Family How concerned are you about PROSTATE CANCER for your family members?	4.767	1.665
Heart Disease - Self How concerned are you about HEART DISEASE for yourself?	4.973	1.644
Heart Disease - Family How concerned are you about HEART DISEASE for your family members?	5.571	1.405
Vitamin Users How frequently do you use vitamins?	3.267	2.582
Risk Factors		
Prostate Cancer - Self How likely do you think you will develop PROSTATE CANCER in your lifetime? Have any members of your family such as your father, brother, uncle, or grandfather ever been diagnosed with PROSTATE CANCER?	2.521	1.563
Prostate Cancer - Family How likely do you think you will develop PROSTATE CANCER in your lifetime? Have any members of your family ever been diagnosed with PROSTATE CANCER?	1.963	0.345
Heart Disease - Self How likely do you think you will develop HEART DISEASE in your lifetime? Have any members of your family ever been diagnosed with HEART DISEASE?	3.863	1.368
Heart Disease - Family How likely do you think you will develop HEART DISEASE in your lifetime? Have any members of your family ever been diagnosed with HEART DISEASE?	1.486	0.502

Methodology

Experimental Design:

2 x 2 between-subjects factorial design manipulating claim types (health claim, phyto-chemical content claim) and endorsement by the American Heart Association and American Institute of Cancer Research (present, absent) as factors. Control group received no claim or endorsement on the front product label

Subjects:

A hundred and forty-six undergraduate business and agri-business students at The Ohio State University

Product and Stimuli:

Product used in this research is tomato juice containing soy protein, a hypothetical functional food that is not available in the market. It has a high level of lycopene that may reduce the risk of prostate cancer and high levels of isoflavones that may reduce the risk of heart disease

Figure 1: Control Label



Figure 2: Phyto-chemical Content Claim with Endorsement



Figure 3: Health Claim with Endorsement



Dependent Variables:

- 1. Attitude toward tomato juice containing soy** was measured using three items with 7-point scales
 - ❖ I feel the tomato juice product is (very bad – very good)
 - ❖ My opinion of the tomato product is (extremely unfavorable – extremely favorable)
 - ❖ Consuming the tomato juice product is likely to be (extremely unpleasant – extremely pleasant)
- 2. Buying intention** was measured using a 7-point scales
 - ❖ If this tomato juice product were available in your local supermarket, how likely are you to purchase? (very unlikely – very likely)

Results and Discussion

- > Positive relationship between attitude toward the product and buying intention
- > Different message contents have no influence on consumer attitude towards the product or buying intention
- > Endorsement by health organizations has positive effects on attitude and buying intention
- > Motivation to search/look for or receive more information about this tomato juice containing soy has a positive relationship with both attitude and buying intention
- > Consumers who perceive that this new product is likely to taste better than others have higher attitudes and are likely to purchase it
- > Price has a mixed effect. Consumers who perceive that the price of the new product will be higher than other tomato juices tend to have lower attitudes, but they are more likely to purchase. This may imply that the higher price is a signal of a premium good that offers benefits
- > Knowledge has mixed effects on consumer attitude and buying intention
- > People who have consumed tomato juice in the past are more likely to purchase this tomato juice containing soy. This may be because of familiarity
- > Concern about prostate cancer and heart disease also has a mixed effect. One would expect people who are more concerned about these diseases would have more positive attitudes toward the product and be more likely to purchase the product. However, results from these regression models do not support such hypotheses

Table 2: Regression Results

Explanatory Variable	Dependent Variable	
	Attitude	Buying Intention
Buying Intention	0.269 ***	
Attitude		1.445 ***
Health Message		
Health Claim	NS	NS
Information Source		
Endorsement	0.558 ***	0.411 *
Individual Characteristics		
Motivation	0.252 ***	0.543 ***
Ability	NS	NS
Product Attributes		
Taste	0.177 ***	0.205 **
Short Run Benefit	NS	NS
Long Run Benefit	NS	-0.171 *
Price	-0.131 **	0.217 **
Diet and Disease Knowledge		
Prostate	NS	1.187 ***
Heart	NS	-1.082 ***
General knowledge	NS	-0.492 ***
Hquiz	0.189 ***	NS
Previous Consumption		
Tomato Juice	NS	0.940 ***
Soy Products	NS	NS
Concern Related to Diseases		
Maintain good health	NS	NS
Prevent Disease	NS	0.581 ***
Prostate Cancer - Self	NS	NS
Prostate Cancer - Family	NS	-0.433 ***
Heart Disease - Self	NS	-0.641 ***
Heart Disease - Family	NS	0.728 ***
Vitamin Users	NS	NS
Risk Factors		
Prostate Cancer - Self	NS	NS
Prostate Cancer - Family	NS	-1.457 ***
Heart Disease - Self	NS	0.241 **
Heart Disease - Family	NS	NS
R-Square	0.688	
F-Value	9.630 ***	
Chi-Square		835.493 ***

NS = Not Significant
 * Significant at 90%, ** Significant at 95%, *** Significant at 99%

Conclusion

This experimental study uses a hypothetical product with two health claims and indicates that consumers react differently to information provided on product labels. Endorsement by health organizations is likely to improve the credibility of health information resulting in higher attitude and buying intention. Results do not show any significant differences in how health claims or phyto-chemical content claims affect consumer behavior. Motivation to process and use the health information on this product is one factor explaining whether individuals will be interested and/or more likely to purchase the product. Consumers also consider other product attributes, especially taste and price when making a purchase decision.

The results of this analysis may be useful for food producers selecting the type of health information to provide on product labels to most effectively influence consumer behavior and help identify and target groups within the population who may be prospects for functional foods.