Korean consumers' perceptions of health/functional food claims according to the strength of scientific evidence

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Abstract

In this study, we investigated that consumers could differentiate between levels of claims and clarify how a visual aid influences consumer understanding of the different claim levels. We interviewed 2,000 consumers in 13 shopping malls on their perception of and confidence in different levels of health claims using seven point scales. The average confidence scores given by participants were 4.17 for the probable level and 4.07 for the possible level; the score for the probable level was significantly higher than that for the possible level ($P < 0.05$). Scores for confidence in claims after reading labels with and without a visual aid were 5.27 and 4.43, respectively; the score for labeling with a visual aid was significantly higher than for labeling without a visual aid ($P < 0.01$). Our results provide compelling evidence that providing health claims with qualifying language differentiating levels of scientific evidence can help consumers understand the strength of scientific evidence behind those claims. Moreover, when a visual aid was included, consumers perceived the scientific levels more clearly and had greater confidence in their meanings than when a visual aid was not included. Although this result suggests that consumers react differently to different claim levels, it is not yet clear whether consumers understand the variations in the degree of scientific support.

Key Words: Consumer confidence, consumer perception, health claim, level of scientific evidence, qualifying language

Introduction

Health claims are potentially powerful tools in consumer communication as they convey information on the health benefits of food or food components. However, health claims also have the potential to misdirect consumers towards food choices that may be against their best interests [1]. Thus, to help ensure correct health claims and prevent exaggerations, many countries have developed laws, guidelines, and codes of practice regarding health claims.

In South Korea, Health/Functional Food (HFF) regulations include controls on communications regarding health claims such as through labeling, presentation, and advertisement [2-5]. KFDA introduced an evidence-based rating system created by World Health Organization (WHO); the system has four categories based on levels of evidence: convincing, probable, possible, and insufficient [6]. The category assigned is determined by considering the type and quality of individual studies and the quantity, consistency, and relevance of the aggregate of studies. The US Food and Drug Administration (FDA) also uses an evidence-based ranking system for qualified health claims [7].

However, certain consumer advocacy groups, such as Consumer Federation of America (CFA) and Center for Science in the Public Interest (CSPI), are opposed to qualified health claims. They argue that consumers cannot differentiate between the various levels of scientific evidence and will likely be misled into purchasing items with health claims that have not yet passed "sufficient" scientific scrutiny [8,9].

Although the effects such claims have on consumer perceptions have not been extensively studied [10], a number of studies have tested consumers' reactions to various nutrition and health messages [11-18]. To properly use HFFs, consumers must be able to clearly understand the meaning of health messages behind a health claim. To address this issue, this study examined the effect of various qualified levels of health claims on consumer attitudes. Our goals were to determine whether consumers can differentiate between levels of claims, and to clarify how a visual aid influences consumer understanding of the different claim levels.

(A) Without a visual aid   (B) With a visual aid

Fig. 1. Hypothetical product label used in this survey

Subjects and Methods

Study design

The study participants were 2,000 male and female adults aged 19 years or older living in Korea. A direct-interview survey was conducted from August 1, 2005 to September 1, 2005. Measures of confidence in the information on health claims and expected health benefits of the product were used as indicators of whether the consumers could distinguish between the various levels of health claims. For this study, we used a hypothetical HFF product, namely a supplement containing plant sterol (Fig. 1). Plant sterol was approved in Korea in 2005 as a HFF to help manage blood cholesterol. Because plant sterol was not approved as a food ingredient before 2005, the average Korean consumer had no information about plant sterol and its health benefits at the time of our study. Thus, we could exclude bias originating from previous information about the health benefits of plant sterol.

Participants and procedures

The study was conducted in 13 geographically dispersed shopping malls in urban areas nationwide. At each site, a central interviewing facility was available where we could recruit participants, select participants with the required background characteristics, and observe and document the interview process. Adults aged 19 and older, were recruited for a study about HFF labeling and were randomly assigned to label conditions. Direct and unpaired interviews were conducted and each interview took 20 to 40 minutes. Participants gave their consent to be interviewed and have their answers recorded.

Questionnaires

We asked the participants two kinds of questions while showing them different cases for the hypothetical product. Each

Table 1. Design of the label condition scheme

Health claims on the label	Levels	Visual aid
Plant sterol helps to maintain cholesterol levels.	Probable	No
Plant sterol may help to maintain cholesterol levels.	Possible	No
Plant sterol may help to improve cholesterol but there is little evidence in human studies.	Insufficient	No
Plant sterol inhibits cholesterol's absorption. This product helps to maintain cholesterol levels because plant sterol is contained.	Probable	Yes
Plant sterol may inhibit cholesterol's absorption. This product may help to maintain cholesterol levels because plant sterol is contained.	Possible	Yes

Table 2. Descriptions of questionnaire

	Questionnaires
Perception	When you read "probable" or "possible" level, how much of scientific levels could you give on each claim? (1 = Extremely low, 7 = Extremely high) When you read "probable", "possible", and/or "insufficient" level claims, which claim do you think have higher scientific levels?
Confidence	How confidence are you in scientific studies that consuming this health/functional food having phytosterol will help for maintain your cholesterol levels? (1 = Not at all confident; 7 = Very confident)

case made a different level of health claim (probable and possible) and was presented with or without a visual aid (Table 1). That is, participants were given product labels with probable and possible claims accompanied by different levels of information. We then asked them to compare the information level and their belief in the health benefits using a seven-point scale (Table 2; 1 = strongly disagree; 7 = strongly agree).

Statistical analysis

All statistical analyses were performed using the SPSS program package version 12.0. Differences between the control and treatment groups were analyzed by Student's *t*-test. All data were reported as mean ± SD. The significance level for all tests was set at $P < 0.05$.

Table 3. General characteristics of participants

Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	519	26.0
Female	1481	74.0
Age		
Under 20	29	1.5
20 - 29	425	21.3
30 - 39	630	31.5
40 - 49	539	27.0
50 - 59	265	13.3
60 - 69	98	4.9
Over 70	14	0.7
Area		
Gyeonggi-do	477	23.9
Seoul	376	18.8
Jeolla-do	344	17.2
Gyeongsang-do	273	13.7
Chungcheong-do	252	12.6
Gangwon-do	189	9.5
Jeju-do	89	4.5
Education career		
Middle school	114	5.8
High school	661	33.5
College / University	1046	53.1
Graduate school	150	7.6
Individual income (ten thousands won)		
Under 100	205	10.6
100 - 199	518	26.7
200 - 299	612	31.5
300 - 399	329	16.9
Over 400	278	14.3
Occupation		
Full time house wife	758	38.3
Professional work	371	18.7
Others	265	13.4
Clerk	174	8.8
Services	154	7.8
Salesman	118	6.0
Production and technical work	61	3.1
Farmer and fishermen	48	2.4
Administration	32	1.6
Intake experience of health/ functional foods		
Yes	1549	73.3
No	531	26.7
Physical status		
Good	159	8.0
Moderate	1345	68.0
Bad	473	23.9

Results

In total, 2,000 consumers were interviewed with the questionnaire. Approximately 26% of the participants were male, and 74% were female. By age range, 21.3% were 20-29 years old, 31.5% were 30-39 years, and 27.0% were 40-49 years old. Of the participants, 73.3% reported having eaten HFFs, whereas

Table 4. Mean score for comparison of consumer's perception for different level claims with or without a visual aid[1]

Levels for health claims	Mean ± SD	T	P
Probable	4.17 ± 1.23	2.492	0.013
Possible	4.07 ± 1.40		
Probable + visual aid	5.37 ± 1.23	-25.977*	0.000
Possible + visual aid	4.41 ± 1.11		

[1] Scale from 1 to 7: 1 = very low, 2 = moderately low, 3 = slightly low, 4 = moderate, 5 = slightly high, 6 = moderately high, 7 = very high

Table 5. The frequency of consumer's perception for higher scientific level when compared at the same time

Level of health claims	Frequency (n)	Percentage (%)
Probable vs. Possible		
No difference	444	22.6
Probable	981	50.0
Possible	538	27.4
Possible vs. Insufficient		
No difference	159	8.0
Possible	1056	52.8
Insufficient	784	39.2

Table 6. Mean score for comparison of consumer's confidence for health claims with or without a visual aid[1]

Visual aid	Mean ± SD	T	P
With	5.27 ± 1.17	-22.135	0.0000
Without	4.43 ± 1.21		

[1] Scale from 1 to 7 "1=low very much, 2=low moderately, 3=low slightly, 4=moderate, 5= high slightly, 6= high moderately, 7=high very much"

26.7% reported that they had never eaten such foods (Table 3). When the participants were asked to read the label and then answer questions about their confidence in the claims about the product on a seven-point scale, the average scores were 4.17 and 4.07 for claims rated as probable and possible, respectively (Table 4). Scores were significantly higher for the probable claim than for the possible claim ($P < 0.05$).

To confirm the effect of a visual aid, food labels having health claims with visual aids representing scientific evidence levels were provided. Average scores with the visual aids were 5.37 for the probable level and 4.41 for the possible level. Again, the score for the probable-level claim was significantly higher ($P < 0.05$). We then asked the participants to read two different claims, determine whether there was a difference in the strength of the scientific level behind those claims. As shown in Table 5, half of the respondents answered that there was more evidence for the higher-level claim.

We investigated consumer confidence in the scientific evidence presented in labels with and without a visual aid (Table 6). Scores for confidence in labels with and without the visual aid were 5.27 and 4.43, respectively, with the score for the label with a visual aid significantly higher than that for the label without a visual aid ($P < 0.01$).

Discussion

In this study, we investigated that consumers could differentiate between levels of claims, and clarify how a visual aid influences consumer understanding of the different claim levels. Health claims communicate potential benefits to the consumer but may also create a bias in perception due to the way a claim is presented or to the beliefs of the individual reading it. With the KFDA's permission, health claims have been ranked at different levels based on the quality and quantity of scientific evidence.

In order to understand the perception of consumers for scientific level of health claims, we interviewed 2,000 consumers with the questionnaire in the shopping malls. Because of interviewing place, which was shopping area, most respondents were middle-aged women (Table 3). When the participants were asked for their confidence with seven point scales, scores were significantly higher for the probable claim than for the possible claim ($P < 0.05$) regardless of visual aids (Table 4). Moreover, scores for confidence in labels with and without the visual aid were 5.27 and 4.43, respectively, with the score for the label with a visual aid significantly higher than that for the label without a visual aid (Table 6).

A few studies of qualified health claims have been conducted in the US. Using a mall-intercept data collection process, the US FDA evaluated a range of product label formats and types of message language [7,12,19]. Visual- and text-based constructs tested the formats' ability to convey the strength of scientific support. The results suggested that text alone did not convey the message of the degree of scientific support for qualified health claims. Visual based formats generally helped consumers identify differences between levels of claims, yet not always in the correct manner. Our study also shows that qualifying language for health claims can be specified to help consumers better understand the strength of scientific evidence. Moreover, with a visual aid, the consumers perceived the levels of scientific evidence more clearly and had greater confidence in their meaning to health than in the case without a visual aid. This result is similar to that found in the US FDA's consumer survey for qualified health claims [19].

Although this result suggests that consumers react differently to several claim levels, it is not clear whether consumers actually understand the difference in the degree of scientific support for claims. Food label information is just one source of marketing communications available to food manufacturers and consumers. An alternative source is product advertising. Consumers are more readily affected by advertisement than by labeling. According to reports by the US Federal Trade Commission, none of the tested qualifying statements in advertisements was correctly interpreted by consumers as describing an associated weaker level of scientific support for the health claim [12]. In experimental studies using self-reports, consumer's experienced forced exposure to the health claim information. This method makes it possible to assess consumer understanding, but it is very

different from a normal shopping experience [1]. Hence, it is probable that studies in which consumers are specifically asked to respond to health claims will overestimate the use of claim information relative to most real-life conditions.

Understanding consumer responses to health and nutrition information on product packages is critical when designing food-labeling regulations. The key message of this study is that further investigation is needed on how to effectively communicate novel, emerging nutrition information on product labels to consumers. The government's goal is to permit the use of more, better, easily understood, and up-to-date scientific information on labels to communicate how food choice can affect the health of consumers. Our results suggest that policymakers should try to enact regulations that will ensure that the exact meanings of health claims are presented on food labels to consumers. Further research on the impacts and effectiveness of food advertisements and labeling is also needed with regard to health claims. Qualitative studies such as focus group interviews may be helpful in identifying more specific disclaimers and effective ways of delivering health messages for food or food components.

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