

# Industry and Consumers Awareness for Effective Management of Functional Animal-based Foods in South Korea

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**ABSTRACT:** In recent years, manufacturers of animal-based foods with health claims have encountered difficulties in the labeling of their products because of a lack of regulation on defining the functionality of animal-based foods. Therefore, this study was conducted to establish the basic requirements for the development of a definition for functional animal-based foods by investigating consumer and industry awareness. Survey data were collected from 114 industry representatives and 1,100 consumers. The questions of the survey included items on production status and future production plans, functionality labeling, promotion plans, establishment of definition, the role of the government, consumer perception, and selection of products. The results show that both industry representatives and consumers believe that legislation and the provision of scientific evidence should be improved for the development of a functional animal-based foods market. The results obtained from this study will contribute to consumer trust by supplying correct information and can be utilized in the industry as basic data for the development of functional animal-based food products.

**Keywords:** functional animal-based foods, awareness investigation, industry, consumer, functional indication

## INTRODUCTION

Following an increase in national income and demands for a healthy lifestyle, both the result of the current well-being trend (1), the factors affecting food consumption have changed from a focus on primary and secondary functions of food (nutrition and palatability) to increased attention to tertiary functions (functionality) (2,3); this trend is related to overnutrition or undernutrition indicated by nutrient imbalances following changes in diet (4). The consumption of foods has accordingly shifted towards macrobiotic or healthy foods due to an increase in chronic diseases, including cancer, hypertension, stroke, and diabetes, caused by hypernutrition (5). Therefore, functional food markets change continuously and the competition to win consumer recognition is becoming more intense (6). Bhaskaran and Hardley (7) concluded that taste, quality, price value, convenience, and the health-promotion effects of functional foods are powerful factors that influence purchasing. Additionally, Gray et al. (8) observed that functional foods have to address consumer needs for convenience, health, and good taste.

In recent years, reflecting consumers' need to maintain

their health, functional food research (9,10) and the commercialization of animal-based foods has begun. However, functional animal-based foods are excluded from the definition of food supplements of the "Health Functional Food Act" of the Korean Food and Drug Administration (11). Health claims are potentially effective methods of interacting with consumers because they convey information on the health benefits of food or food components (12). Park (13) suggested a functionality-labeling plan for dairy products through the revision of the "Livestock Sanitation Management Act"; however, currently, no clear definition or labeling regulation of functional animal-based foods exists in the relevant act and associated regulations. Therefore, functional animal-based foods are considered a false expression and the association with exaggerated advertising through labeling and functionality not only hampers the increase in consumption, but also causes difficulties for functional food producers in the management of functional animal-based foods (14,15). Kang et al. (16) reported that consumers pay more attention to information on a product (39.1%) than to recommendations from professionals (30.5%), such as doctors or pharmacists, when purchasing healthy functional foods. In order

Received 24 April 2013; Accepted 5 November 2013

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to enhance the development of the animal-based food industry as well as consumer protection and reliability, a scientific basis and legal regulation of the recognition and labeling of animal-based functional foods are urgently needed (17,18).

This study was conducted to provide basic data on functional animal-based foods through the investigation and analysis of the production status and consumer awareness of functional animal-based foods and plans and awareness of the role of the government in the industry.

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## SUBJECTS AND METHODS

### Participants

This survey was conducted from July 20 to November 20, 2009. One hundred and fourteen subjects participated in this survey from relevant industry representatives, which consisted of 44 small and 70 large companies working in Gyeonggi, Honam, Chungcheong, Seoul, and Jeju. For the consumers, the questionnaires were collected from 1,100 housewives in their 30s and 40s who are major food buyers.

### Survey strategies applied to companies and consumers

The questionnaires were administered by telephone, mail, email, fax, or one-on-one interviews. The survey items, developed to suit the purposes of this study, followed the recommendations of the Advisory Committee, which were based on the relevant research literature from both academia and the food industry. The survey questions were then revised and supplemented following expert review.

Survey items for the companies included questions on the production status and future production plans of functional animal-based foods, functional labeling, promotional plans, the definition of functional animal-based foods (including specific breeding management and feedstuffs provided, specific ingredient content, and whether the food functions to strengthen and maintain the body as well as enhance health), and the role of government (definition of functional animal-based foods and categorization according to types, enforcing manufacturers' obligation to submit scientific evidence of health claims and prevention of exaggerated advertising).

The survey items for consumers concerned perception (reasons for their trust or distrust in the labeling of specific ingredients and the efficacy of animal-based foods), selection of products, and their opinions on an effective management plan for the labeling of specific ingredients and the efficacy of animal-based foods (establishment of the related laws, reinforcement of the role of consumer organizations after standard and specification setup, the

operation of current law supplements, and defining the permissible range for labeling and advertisement).

The survey categories were calculated as the percentage of numbers of respondents in each category. The data of both companies and consumers were analyzed using cross-analysis and frequency analysis with SPSS (SPSS Inc., Chicago, IL, USA).

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## RESULTS AND DISCUSSION

### General respondent information

For the company surveys, 114 companies responded; 107 of the company respondents were male (93.9%). The most common age group, educational level, and occupation were 30~39 years (42.1%, 48 participants), college graduate (56.2%, 64 participants), and marketing-related (37.7%, 43 people), respectively. The breakdown of respondents by geographical area were as follows: Gyeonggi, 28.9% (33 companies); Honam, 26.3% (30 companies); Chungcheong, 23.7% (27 companies); Seoul, 20.2% (23 companies); and Jeju, 0.9% (1 company). Affiliated institutions were mostly active in the dairy industry (56.2%, 64 companies) and meat processing (36.8%, 42 companies).

For the consumers, surveys were collected from 1,100 housewives in their 30s and 40s. The most common educational level was college graduate (51.5%, 566 people), and 29.5% of the consumers lived in the Seoul area. The most common cost of living range was 2~3 million won per year (34.6%, 381 people) and the residence type was apartment (61.6%, 677 people) (Table 1).

### Industry production status of functional animal-based foods

Ninety-one companies manufactured functional animal-based foods; this included 36 milk companies (39.6%), 30 fermented milk companies (33%), 10 chicken companies (10.9%), 6 pork companies (6.6%), 5 egg companies (5.5%), and 4 ham companies (4.4%) (Fig. 1). The proportion of dairy-related companies was significantly higher than that of other livestock companies. However, the production of functional animal-based foods is lower than that of general animal-based foods because of lower consumer awareness compared with high raw material prices.

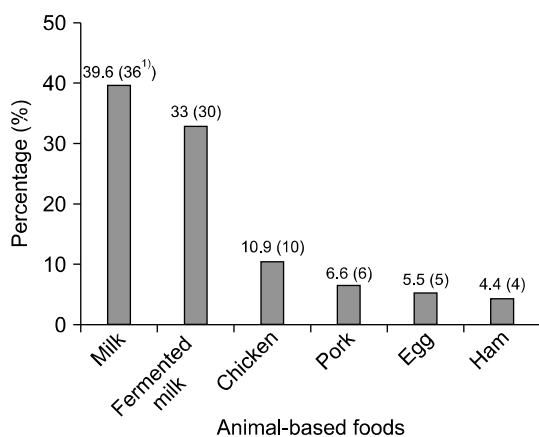
### Industry use of functional labeling and promotional plans

Specific ingredients and efficacy claims of functional animal-based foods have to be labeled with scientific evidence in order to gain the trust of consumers. According to the 114 surveyed companies, 77 (67.5%) believe that the standard content of functional animal-based foods is well labeled. Regarding advertising, companies emphasized advertisement of product content in the following order: fluids (31.6%, 36 companies), general animal-based

**Table 1.** General information of respondents

		Variable	Frequency (N <sup>1)</sup> )	Percentage (%)	
Industry	Gender	Male	107	93.9	
		Female	7	6.1	
	Age	20~29	8	7.0	
		30~39	48	42.1	
		40~49	44	38.6	
		50~59	14	12.3	
	Education	High school	7	6.1	
		College	64	56.2	
		Graduate students	43	37.7	
	Practice areas	Public relation (marketing)	43	37.7	
		Production	15	13.3	
		Research & development	20	17.5	
		Consumer counseling	7	6.1	
		Etc.	29	25.4	
	Area	Seoul	23	20.2	
		Gyeonggi	33	28.9	
		Chungcheong	27	23.7	
Honam		30	26.3		
Jeju		1	0.9		
Affiliated institutions	Meat processors	42	36.8		
	Dairy industry	64	56.2		
	Etc.	8	7.0		
Total		114	100		
Consumer	Education	Under middle school	40	3.6	
		High school	460	41.8	
		College	566	51.5	
		Graduate students	34	3.1	
	Area	Seoul	325	29.5	
		Gyeonggi	190	17.3	
		Chungcheong	200	18.2	
		Honam	168	15.3	
		Yeongnam	160	14.5	
		Gangwon	57	5.2	
	Cost of living (10,000 won)	Less than 100	37	3.4	
		100~200	195	17.7	
		200~300	381	34.6	
		300~400	262	23.8	
		400~500	153	13.9	
		More than 500	72	6.6	
	Living style	Apartment	677	61.6	
		Detached house	216	19.6	
		Multiplex house	74	6.7	
		Row house, villa	120	10.9	
Etc.		13	1.2		
Total		1,100	100		

<sup>1)</sup>The number of respondents.

**Fig. 1.** The production status of functional animal-based foods.

<sup>1)</sup>The number of respondents.

foods (21%, 24 companies), functional animal-based foods (20.2%, 23 companies), and same importance (7%, 8 companies). Therefore, the weight on the advertisement of general livestock products is higher than that of functional animal-based foods. Broadcasting (36.8%, 42 companies) was the most common medium for the advertising of functional animal-based foods, followed by printed media (35.1%, 40 companies), internet (14%, 16 companies), and direct public relations through salespeople (7.9%, 9 companies) (Table 2). Additionally, the content of functional animal-based foods was considered the most important marketing item.

Exaggerated advertisement leads to a reduction in consumer trust and a distrust of animal-based foods labeled

**Table 2.** Companies’ functional labeling and promotion plans

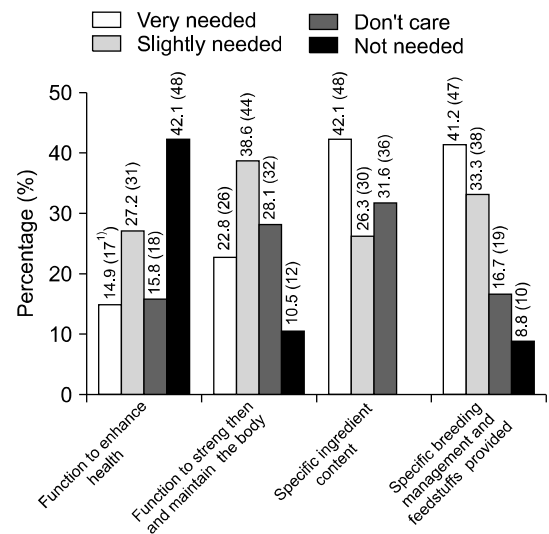
	Variable	Frequency (N <sup>1)</sup> )	Percentage (%)
Relative importance of advertising	Fluid situations	36	31.6
	General animal-based foods	24	21
	Functional animal-based foods	23	20.2
	Same importance	8	7
	Etc.	23	20.2
	Total	114	100
Preference on advertising media	Broadcasting	42	36.8
	Print	40	35.1
	Internet	16	14
	Direct public relation	9	7.9
	Etc.	7	6.2
		Total	114

<sup>1)</sup>The number of respondents.

with claims regarding functionality. Lee (19) pointed out that exaggerated advertising, which has been cited as the reason for skepticism relating to a specific advertisement, is a problem that needs to be solved first in order to gain consumers’ trust in a given product.

**Industry perception of establishing a definition for functional animal-based foods and the role of the government**

In order to properly establish a definition for functional animal-based foods, we suggested possibilities such as “specific breeding management and feedstuffs provided”, “specific ingredient content”, “functions to strengthen and maintain the body”, and “functions to enhance health”, because these seemed reasonable components of a definition of functional animal-based foods. Each item was evaluated according to its importance in a possible definition of functional animal-based foods on a four-point scale (much needed, slightly needed, don't care, and not needed). In the case of “specific breeding management and feedstuffs provided”, the responses were as follows: much needed (41.2%, 47 companies), slightly needed (33.3%, 38 companies), don't care (16.7%, 19 companies), and not needed (8.8%, 10 companies). In the case of “specific ingredient content”, the responses were as follows: much needed (42.1%, 48 companies), don't care (31.6%, 36 companies), and slightly needed (26.3%, 30 companies). Thus, companies think that specific diets for livestock or specific ingredients containing animal-based products should be included in the definition of functional animal-based foods. In the case of “functions to strengthen and maintain the body”, the responses were as follows: slightly needed (38.6%, 44 companies), don't care (28.1%, 32 companies), much needed (22.8%, 26 companies), and not needed (10.5%, 12 companies). In the case of “functions to enhance health”, the responses were as follows: not needed (42.1%, 48 companies), slightly needed (27.2%, 31 companies), don't care (15.8%, 18 companies), and much needed (14.9%, 17 companies) (Fig. 2). These results suggest that com-



**Fig. 2.** Preference ranking of functions to be included in the definition of functional animal-based foods. <sup>1)</sup>The number of respondents.

panies tend to take a negative stance towards defining functional animal-based foods in terms of their health properties—in other words, their ability to treat or prevent disease.

Regarding the government’s role in the management of functional animal-based foods, the most common answer was to define functional animal-based foods and categorize them according to type (63.2%, 72 companies). Other opinions expressed the government’s role in enforcing the obligation of the manufacturer to submit scientific evidence (19.3%, 22 companies) and more stringent rules against exaggerated advertisements (12.3%, 14 companies). Therefore, most companies believe that, above all, the government should establish legislation regulating functional animal-based foods. Opinions on the components of an effective management plan for the labeling of specific ingredients and the efficacy of animal-based foods include supplementing current laws (43.0%, 49 companies), establishment of related laws

(37.7%, 43 companies), and strengthened advertising of functional animal-based foods (19.3%, 22 companies) (Table 3). Companies expected governments to prepare regulations and systems urgently because they perceived the current, senselessly crowded market as not beneficial to either the industry or consumers. Indeed, this lack of regulation appeared to make companies believe that consumers would continue to misunderstand and distrust functional animal-based foods.

### Consumer perceptions about the labeling of specific ingredients and the efficacy of animal-based foods

**Reasons to trust the labeling of specific ingredients and the efficacy of animal-based foods:** The responses concerning reasons for trusting functional animal-based foods were as follows: safety and hygiene management (35.3%, 388 people), manufacturer image or advertising content (28.2%, 310 people), and the efficacy of specific products in health promotion (26.4%, 290 people).

According to these results, trust in the labeling of specific ingredients and the efficacy of animal-based foods is not based on scientific fact but rather on images of brands or consumers' subjective speculations about them. Therefore, in order to obtain greater trust of more consumers, companies should perhaps orient towards a more scientific evidence-based approach to advertising functional animal-based foods.

**Reasons to distrust the labeling of specific ingredients and the efficacy of animal-based foods:** The responses concerning reasons for distrust are as follows: lack of a verification system for ingredients and the efficacy of the foods (31.6%, 348 people), lack of a difference between functional and general animal-based foods (29.7%, 327 people), an excessive of similar products (20.2%, 222 people), lack of effectiveness in health promotion (11.1%, 122 people), and absence of relevant laws about display and standards (7.2%, 79 people) (Table 4).

Ohn and Kim (20) reported that half of their respondents did not trust health supplements. Similar to health supplements, our study shows that consumers distrust functional animal-based foods because of the lack of scientific support. To recover trust, better labeling of specific ingredients and the efficacy of animal-based foods must be implemented. Therefore, a system to verify specific ingredients and the efficacy of animal-based foods could be created by establishing relevant laws concerning display and standards. This contributes to the improvement of the discriminatory image of general animal-based foods in order to regain consumer trust.

### Consumer perceptions concerning the selection of products based on labeling of specific ingredients and efficacy of animal-based foods in the future

In connection with the select labeling of specific in-

**Table 3.** Companies' responses regarding the role of government in the functional animal-based food industry and development of an effective management plan for functional animal-based foods

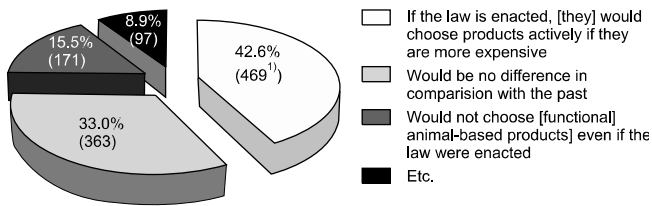
	Variable	Frequency (N <sup>1)</sup> )	Percentage (%)
Role of government	Define and categorize according to types	72	63.2
	Obligation to submission of scientific basis	22	19.3
	Crackdown of exaggerated advertisement	14	12.3
	Etc.	6	5.2
	Total	114	100
Effective management plan	Operation of current law	49	43.0
	Establish of related law	43	37.7
	Strengthen advertisement	22	19.3
	Total	114	100

<sup>1)</sup>The number of respondents.

**Table 4.** Consumers' perceptions of the labeling of specific ingredients and efficacy of animal-based foods

	Variable	Frequency (N <sup>1)</sup> )	Percentage (%)
The reason of trust	Safety and hygiene management	388	35.3
	Manufacturer image or advertising content	310	28.2
	Influence of health promotion by specific efficacy	290	26.4
	Etc.	112	10.1
	Total	1,100	100
The reason of distrust	Lack of verification system about ingredient and efficacy	348	31.6
	Lack of differentiation between general animal-based foods	327	29.7
	Excessive similar products	222	20.2
	Lack of relevance between specific efficacy and health promotion	122	11.1
	Absence of relevant law about display and standard	79	7.2
	Etc.	2	0.2
	Total	1,100	100

<sup>1)</sup>The number of respondents.



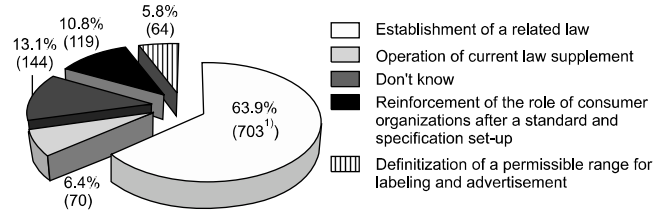
**Fig. 3.** Consumers' responses regarding their future selection of products according to the labeling of specific ingredients and the efficacy of animal-based foods. <sup>1)</sup>The number of respondents.

redients and the efficacy of animal-based foods, most customers answered that "if the law is enacted, [they] would choose products actively even if they are more expensive" (42.6%, 469 people). Additional responses that there "would be no difference in comparison with the past" and "would not choose [functional animal-based products] even if the law were enacted" were 33.0% (363 people) and 15.5% (171 people), respectively (Fig. 3). Kim et al. (21) found that consumers' purchasing of environment-friendly agricultural products at a higher price was influenced by the reliability of the products. This means that consumers are willing to buy products regardless of the price if there is no reason to mistrust them.

#### Consumer perceptions regarding an effective management plan for labeling specific ingredients and the efficacy of animal-based foods

Currently, the labeling of specific ingredients and the efficacy of animal-based foods have no standards or specifications; therefore, consumers believe that the most effective management plan is the establishment of a related law (63.9%, 703 people). Additionally, responses included the following: the reinforcement of the role of consumer organizations after a standard and specification setup (10.8%, 119 people), the operation of current law supplements (6.4%, 70 people), and definition of a permissible range for labeling and advertisement (5.8%, 64 people). However, 114 consumers (13.1%) responded with "don't know" (Fig. 4). The results show that the problem could be solved through the establishment of a related law. In addition, the need to complement existing laws has been raised frequently in previous studies (22,23). In other words, the effective management of functional animal-based foods, such as the establishment of a functional livestock certification system and related laws, is urgently needed. This study therefore indicates that industry representatives and consumers believe that certification of functional animal-based foods should be implemented and done according to scientific evidence and relevant laws.

In conclusion, the results of this study suggest a number of measures that the government, companies, and consumers should take in order to effectively manage



**Fig. 4.** Consumers' views on the development of an effective management plan for the labeling of specific ingredients and the efficacy of animal-based foods. <sup>1)</sup>The number of respondents.

the industry surrounding functional animal-based foods. First, the government should establish a definition for functional animal-based foods through supplementation of current laws or through the establishment of a related law. The industry should then obtain comprehensive scientific evidence and provide appropriate information through advertising to gain the trust of consumers. We hope that this study will reinforce consumer trust by providing accurate information to the consumers and industries on functional animal-based foods. Furthermore, our study provides basic information for industrial promotion and development.

#### ACKNOWLEDGMENTS

This study was supported by a grant (Project Code No. Z-FS03-2009-09-0201) from the Animal, Plant and Fisheries Quarantine and Inspection Agency (QIA), at the Ministry of Food, Agriculture, Forestry and Fisheries, Republic of Korea in 2009.

#### AUTHOR DISCLOSURE STATEMENT

The authors declare no conflict of interest.

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