



A Study on Strategic Ways to Increase Eco-friendly Food Sales Using IPA¹

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Abstract

Purpose: This study measured the consumer-perceived importance and satisfaction of eco-friendly food selection factors and performed the IPA to derive the factors that need to be maintained, reinforced, improved and selectively improved or where investment need to be minimized, and thus provide some clues for eco-friendly food companies' sales growth. **Research design, data and methodology:** To this end, efficient questionnaires of a total of 312 respondents who answered the questions about the importance of and the satisfaction with 20 selection attribute factors of eco-friendly foods were returned, and then, paired-samples t-test and IPA by all respondents, gender, age and incomes were conducted. **Results:** The analysis showed that a maintenance/reinforcement strategies planned by companies are required for some factors including 'safety' and 'product quality' at the first quadrant, while active improvement strategies are required for others including 'price' and 'flavor' at the second quadrant. **Conclusions:** The findings show that different marketing strategies should be established for each consumer who often purchase eco-friendly foods, and that more effective and efficient performance of eco-friendly food companies may be acquired by establishing and operating active improvement strategies.

Keywords : Eco-friendly food, Selection attribute, Invigoration of Sales, IPA

JEL Classification Code : M10, M11, M31

1. Introduction

Industrial advancement and continuous population growth in modern society have substantially driven up the food consumption. The ever-increasing food demand has propelled the mass food production, which has caused some serious environmental problems, e. g. global environmental pollution and ecosystem destruction (Lee et al., 2011). Meanwhile, the occurrence of zoonoses including the mad cow disease and avian flu, as well as the emergence of diseases associated with climate change e. g. novel influenza and respiratory diseases, has raised the public awareness of healthy and sustainable living such as LOHAS and well-being, which has resulted in the growing demand for eco-friendly foods valuing environment and health.

Notably, the demand for safe and healthy foods and the interest in eco-friendly foods that avert the destruction of ecosystems have

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developed into the concerns about environmentally hazardous substances, various food additives overused in processed foods, and abuse and import of GMO foods, which has underpinned the increasing interest in local foods or eco-friendly foods and steered consumers toward more prudent food choices. Also, with incomes rising and with the quality of life emerging as the essential value, consumers opt for the health of their families and the safety of foods. That is, when it comes to food consumption, people pursue not just survival but hygiene, quality and safety.

In response to consumer needs, the eco-friendly food segment is one of the fastest growing segments in the food industry over the past decade (Lockie et al., 2004). The Ministry of Agriculture, Food and Rural Affairs has picked 5 food segments of great growth potential (i. e. eco-friendly foods, personalized special foods, functional foods, convenience foods and export foods) with intent to scale up those segments from KRW 12.440 trillion in 2018 to KRW 16.96 trillion and KRW 24.85 trillion in 2022 and 2030, respectively, through diverse support measures (The Korea Economic Daily, 2019).

Products made from safe local materials and considering consumer health have been launched in the food industry and well-received, whilst specialized food brands have been competing one another (The Sports World, 2013). With consumers having greater options in today's market environment, being chosen preemptively by consumers is critical to corporate survival. Thus, companies need to formulate a range of products and services to meet consumer needs and take actions to persuade consumers into choosing their products or services. However, consumers' perception of eco-friendly foods and competitive advantage relevant to selection attributes have hardly been documented. Hence, this study measured the consumer-perceived importance and satisfaction in terms of the 20 selection attribute factors suggested by Park et al.(2015) Also, the ratings of different gender/age/income groups as well as all respondents underwent the IPA(Importance Performance Analysis) to derive the factors that would require some maintenance, reinforcement or immediate improvement.

The findings on the effective selection attributes in consumers' choice of eco-friendly foods in this study suggest a range of ways for eco-friendly food companies to implement effective strategies for sales growth.

2. Theoretical Background

2.1. Eco-friendly Food

The increasing interest in eco-friendly foods as well as the growing consumption thereof has led to the investment in quality of life and health, while at the same time a growing number of wellbeing consumers prefer safe and clean eco-friendly foods despite their relatively higher prices (Park & Kim, 2010).

According to the Chapter 1: Article 2(1) of the ACT ON THE PROMOTION OF ENVIRONMENT-FRIENDLY AGRICULTURE AND FISHERIES AND THE MANAGEMENT OF AND SUPPORT FOR ORGANIC FOODS, ETC. (revised on Aug. 27, 2019), environment-friendly agriculture and fisheries refer to the "industries producing agricultural, marine, livestock and forest products ('agro-fishery products', hereinafter) in healthy environment where chemicals such as synthetic pesticides, chemical fertilizers, antibiotics and bactericides are not used at all or used minimally (National Agricultural Products Quality Management Service, 2019)." Environment-friendly agro-fishery products refer to the "products yielded through environment-friendly agriculture and fishery, specifically referring to organic agro-fishery products, pesticide-free agricultural products, antibiotics-free livestock products, antibiotic-free fishery products and fishery products with no active ingredients used," whilst organic foods refer to "organically produced organic agro-fishery products and organically processed foods (i.e. commercial foods manufactured and processed using organic agro-fishery materials)"(National Agricultural Products Quality Management Service, 2019).

Certified eco-friendly foods are sub-categorized into organic, pesticide-free and antibiotics-free foods, depending on their production methods and chemical use. Organic foods refer to the organically produced agricultural products and organically processed foods without using chemical fertilizers and organic synthetic fertilizers. Pesticide-free foods refer to the agricultural products grown with no organic synthetic pesticides but less than 1/3 of recommended amounts of chemical fertilizers and also the processed foods using such agricultural products. Antibiotics-free foods refer to the livestock products and their by-products produced without using antibiotics for growth and the processed products thereof (Lee, 2016). As aforementioned, certified eco-friendly foods are largely sub-divided into environmentally friendly grown agro-livestock products and organically processed foods made from the agro-livestock products for commercial purposes, both of which are involved in the definition of the eco-friendly foods of interest in this study.

2.2. Selection Attributes

Selection attributes refer to the factors that form an attitude towards product attributes that cause the gap between what customers prefer and what they purchase prior to their making decisions on their choices of products(Kong, 2007). Such

attributes make consumers associate them with certain outcomes (Jeong, 2011).

When modern consumers purchase foods, they purchase not just foods per se but also their specific attributes, which exert substantial impacts on consumers' food choices (Jang et al., 2009). Affected by many factors, consumers' food selection is a complex process as shown by several studies (Furst et al., 1996; Magnusson et al., 2003). In general, variables exerting effects on product selection include individual characteristic variables, e.g. consumers' lifestyle, individuality and self-concept (Lee et al., 2001). When choosing food products, consumers make choices based on their psychological and physiological needs and signals (Furst et al., 1996).

Using the selection attribute factors suggested by Park et al.(2015), this study investigated consumers' selection of eco-friendly foods in view of the factors outlined in <Table 1>.

Table 1: Consumers' eco-friendly food selection factors

No	Factor	No	Factor
1	Eco Certification	11	Freshness
2	Processing Methods	12	Product Quality
3	Food Additive Status	13	Country of Origin
4	Manufacturing Method	14	Price
5	Main Raw Material	15	Volume
6	Manufacturer Awareness	16	Texture of Food
7	Packaging	17	Flavor
8	Purchase Location	18	Expiration Date
9	Keep After Purchase	19	Date of Manufacture
10	Nutrient Content	20	Safety

3. Empirical Analysis

3.1. Data Collection

To collect the data for analysis, consumers who had purchased eco-friendly foods were surveyed with convenience sampling for 20 days from June 3, 2019 in Seoul and Gyeonggi-do. A total of 312 valid questionnaire sheets were collected and used for analysis. The demographic characteristics of the respondents used for analysis are shown in <Table 2>.

Table 2: Demographic Characteristics

Division		Frequency	Percentage (%)
Gender	Male	146	46.8
	Female	166	53.2
Age	20~29	31	9.9
	30~39	124	39.7
	40~49	104	33.3

	50~59	50	16.0
	60 or older	3	1.0
Monthly income	Less than 3 million	45	14.4
	3~4 million	53	17.0
	4~5 million	57	18.3
	5~6 million	59	18.9
	More than 6 million	98	31.4

As outlined in <Table 1>, based on Park et al.(2015), respondents were asked to rate each factor of eco-friendly food selection attributes on a 5-point scale after associating each factor with the eco-friendly foods they had purchased. The importance relevant to the purchase of eco-friendly foods was rated from 1(‘Very important’) to 5(‘Never important’). The satisfaction was rated from 1(‘Very satisfied’) to 5(‘Never satisfied’). The responses to each item were reverse-coded for analysis.

3.2. Analysis Methodology

IPA is a method of determining how the importance and satisfaction of selection attributes of products and services are perceived by consumers (Seo et al., 2015). That is, IPA comparatively analyzes the self-reported pre-purchase importance of and post-purchase satisfaction with products and services to identify the relative importance and satisfaction in light of each attribute (Oh, 2001; Seo et al., 2015).

Yang et al.(2018) proposed a 2-phase method of deriving strategies from the gaps in consumer perceptions, comprising IPA (phase 1) and SWOT/AHP (phase 2). In this study, the IPA was used to determine some clues for increasing sales of eco-friendly food companies in view of the attribute factors affecting consumer choices. Also, to derive diverse clues focused on target customers, in-depth analysis was performed based on the sub-categorized gender, age and income groups.

3.3. Results of Paired-sample t-test and IPA

As for the paired-sample t-test results of each item, all 20 eco-friendly food selection attribute factors showed statistically significant differences between importance and satisfaction. The IPA results of eco-friendly food selection attributes are shown in <Table 3>.

Table 3: Results of Paired Sample t-test(n=312)

	Variables	Compare between sub items	Mean	S.D.	Mean Difference	t-value	p-value
1	Eco Certification	importance	4.20	0.89	0.62	12.756	0.000
		satisfaction	3.58	0.84			
2	Processing Methods	importance	3.85	0.97	0.51	9.575	0.000
		satisfaction	3.34	0.80			
3	Food Additive Status	importance	4.19	0.92	0.72	12.997	0.000
		satisfaction	3.47	0.87			
4	Manufacturing Method	importance	3.92	0.98	0.56	10.220	0.000
		satisfaction	3.36	0.81			
5	Main Raw Material	importance	4.36	0.84	0.68	13.262	0.000

		satisfaction	3.68	0.85			
6	Manufacturer Awareness	importance	4.16	0.87	0.44	8.876	0.000
		satisfaction	3.72	0.87			
7	Packaging	importance	3.77	0.98	0.42	7.734	0.000
		satisfaction	3.35	0.84			
8	Purchase Location	importance	3.56	0.96	0.15	3.026	0.003
		satisfaction	3.41	0.77			
9	Keep After Purchase	importance	3.76	0.96	0.39	7.464	0.000
		satisfaction	3.37	0.80			
10	Nutrient Content	importance	3.84	0.93	0.38	7.086	0.000
		satisfaction	3.46	0.82			
11	Freshness	importance	4.45	0.78	0.80	14.442	0.000
		satisfaction	3.65	0.93			
12	Product Quality	importance	4.47	0.77	0.80	15.199	0.000
		satisfaction	3.67	0.92			
13	Country of Origin	importance	4.17	0.89	0.53	9.921	0.000
		satisfaction	3.64	0.88			
14	Price	importance	4.07	0.88	1.10	14.667	0.000
		satisfaction	2.97	1.04			
15	Volume	importance	3.72	0.94	0.73	10.552	0.000
		satisfaction	2.99	0.88			
16	Texture of Food	importance	3.83	0.93	0.56	9.155	0.000
		satisfaction	3.27	0.80			
17	Flavor	importance	4.11	0.91	0.72	11.573	0.000
		satisfaction	3.39	0.87			
18	Expiration Date	importance	4.11	0.92	0.67	11.160	0.000
		satisfaction	3.44	0.90			
19	Expiration Date	importance	4.15	0.94	0.67	11.948	0.000
		satisfaction	3.48	0.88			
20	Safety	importance	4.51	0.81	0.83	15.532	0.000
		satisfaction	3.68	0.92			

As for the IPA results in <Fig. 1>, the 1st quadrant considered to have competitive advantage among the eco-friendly food selection attributes requires some maintenance and reinforcement strategies, whereas the 2nd quadrant requires some immediate improvements (Park et al., 2015; Yang et al., 2014). The 3rd quadrant characterized by low importance and satisfaction requires some selective improvements, whereas the 4th quadrant characterized by low importance and high

satisfaction requires a gradual reduction in investment over time (Park et al., 2015; Yang et al., 2014).

As for the analysis of all respondents, the consumers perceived the 1st-quadrant factors (i. e. ‘eco certification’, ‘food additive status’, ‘main raw material’, ‘manufacturer awareness’, ‘freshness’, ‘product quality’, ‘country of origin’, ‘date of manufacture’ and ‘safety’) as highly important and satisfactory, which suggests the need to secure competitive advantage through continuous investment in the foregoing factors. The 2nd-quadrant factors (i. e. ‘price’, ‘flavor’ and ‘expiration date’) were perceived as important but less satisfactory, which suggests that immediate improvement, maintenance or reinforcement is required. The 3rd-quadrant factors (i.e. ‘processing methods’, ‘manufacturing method’, ‘packaging’, ‘purchase location’, ‘keep after purchase’, ‘volume’ and ‘texture of food’) were rated low in both importance and satisfaction, which suggests the need for improvement strategies for consumers who purchase eco-friendly foods. The ‘nutrient content(nutritive value)’ in the 4th quadrant was rated low in importance but high in satisfaction, which suggests the ‘nutrient content’ does not require high-priority consideration. The IPA results of all respondents are shown in <Fig. 1>.

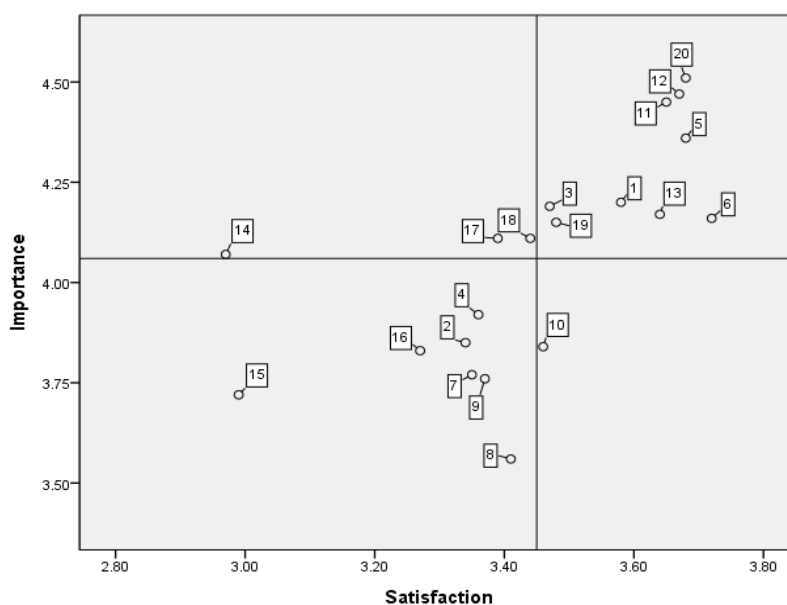


Figure 1: IPA results for all respondents(n=312)

Meanwhile, the analysis results of the factors in each quadrant in relation to gender, age and income groups should be conducive to eco-friendly food companies’ implementation of ‘selection and concentration’ strategies targeted at specific customer groups. Respondents were sub-divided into 2 age groups (< 40 y.o. vs ≥ 40 y.o.), and 2 income groups (< KRW 3M vs ≥ KRW 3M) for the IPA, which returned the following results. Yet, for simplicity, the paired-sample t-test and IPA results of each group are not presented but the factors in each quadrant.

First, the paired-sample t-test results of gender differences are as follows. Males showed no statistically significant differences between importance and satisfaction, whereas females showed no statistically significant differences between importance and satisfaction only in the ‘purchase location,’ which confirmed the different perspectives between males and females towards the selection attributes of eco-friendly foods. As for the IPA results by gender, males showed low satisfaction compared to importance in ‘price’, ‘flavor’ and ‘date of manufacture’, whereas females reported low satisfaction compared to importance in ‘food additive status’, ‘flavor’ and ‘expiration date’, which suggests those factors be improved. Also, ‘packaging’, ‘purchase location’ and ‘nutrient content’ were rated low in importance but high in satisfaction in females, which supports the need for the gradual reduction in investment. The gender differences in IPA results are shown in <Table 4>.

Table 4: IPA results of gender difference

Division	Male	Female

Quadrant 1	Eco Certification Food Additive Status Main Raw Material Manufacturer Awareness Freshness Product Quality Country of Origin Expiration Date Safety	Eco Certification Main Raw Material Manufacturer Awareness Freshness Product Quality Country of Origin Date of Manufacture Safety
Quadrant 2	Price Flavor Date of Manufacture	Food Additive Status Flavor Expiration Date
Quadrant 3	Processing Methods Manufacturing Method Packaging Purchase Location Keep After Purchase Nutrient Content Volume Texture of Food	Processing Methods Manufacturing Method Keep After Purchase Price Volume Texture of Food
Quadrant 4	-	Packaging Purchase Location Nutrient Content

As for the paired-sample t-test results by age, statistically significant differences between importance and satisfaction were not found in ‘price’, ‘volume’ and ‘texture of food’ factors in the < 40 y.o. group, whereas only in ‘price’ and ‘volume’ factors in the ≥ 40 y.o. group. As for the IPA results by age, the < 40 y.o. group showed low satisfaction compared to importance in ‘price’, ‘flavor’ and ‘expiration date’, whereas the ≥40 y.o. group did so in ‘eco certification’, ‘food additive status’, ‘freshness’, ‘expiration date’ and ‘date of manufacture’ factors, which suggests the need for improvements. Also, in the > 40 y.o. group, the importance of ‘purchase location’ was low in contrast to high satisfaction, which suggests the need to gradually reduce investment in the factor. The IPA results by age group are shown in <Table 5>.

Table 5: IPA results of age

Division	under 40	40 and older
Quadrant 1	Eco Certification Food Additive Status Main Raw Material Manufacturer Awareness Freshness Product Quality Country of Origin Date of Manufacture Safety	Main Raw Material Manufacturer Awareness Product Quality Country of Origin Safety
Quadrant 2	Price Flavor Expiration Date	Eco Certification Food Additive Status Freshness Expiration Date Date of Manufacture

Quadrant 3	Processing Methods Manufacturing Method Packaging Keep After Purchase Nutrient Content Volume Texture of Food	Processing Methods Manufacturing Method Packaging Purchase Location Keep After Purchase Nutrient Content Price Volume Texture of Food Flavor
Quadrant 4	Purchase Location	-

Finally, as for the paired-sample t-test results of eco-friendly food selection attributes by monthly income, statistically significant differences were not found between importance and satisfaction in the ‘purchase location’ factor in the < KRW 3M group, whereas the ≥ KRW 3M group showed no statistically significant differences between importance and satisfaction in all factors. As for the IPA results by monthly income, satisfaction was low compared to importance in ‘food additive status’, ‘price’, ‘flavor’ and ‘expiration date’ in the < KRW 3M group, whereas in ‘price’ and ‘expiration date’ in the ≥KRW 3M group, which suggests the need for improvements accordingly. Also, the > KRW 3M group showed low importance but high satisfaction in ‘packaging, ‘purchase location’ and ‘nutrient content’, which suggests the need to consider a gradual reduction in investment. The IPA results by monthly income are shown in <Table 6>.

Table 6: IPA results of monthly income

Division	Less than 3 million	3 million and more
Quadrant 1	Eco Certification Main Raw Material Manufacturer Awareness Freshness Product Quality Country of Origin Date of Manufacture Safety	Eco Certification Food Additive Status Main Raw Material Manufacturer Awareness Freshness Product Quality Country of Origin Date of Manufacture Safety
Quadrant 2	Food Additive Status Price Flavor Expiration Date	Price Expiration Date
Quadrant 3	Processing Methods Manufacturing Method Keep After Purchase Volume Texture of Food	Processing Methods Manufacturing Method Packaging Purchase Location Keep After Purchase Nutrient Content Volume Texture of Food Flavor
Quadrant 4	Packaging Purchase Location Nutrient Content	-

4. Conclusion & Discussions

This study measured the consumer-perceived importance and satisfaction of eco-friendly food selection factors and performed the IPA to derive the factors that need to be maintained, reinforced, improved and selectively improved or where investment need to be minimized, and thus provide some clues for eco-friendly food companies' sales growth.

As for the IPA results of all respondents, 'eco certification', 'food additive status', 'main raw material', 'manufacturer awareness', 'freshness', 'product quality', 'country of origin', 'date of manufacture' and 'safety' require some competitive advantage through continuous investment, whilst 'price', 'flavor', and 'expiration date' were found very important with average satisfaction, which supports the need for immediate improvement, maintenance or reinforcement. When it comes to 'price', modern consumers actively and decisively purchase the products suitable for them instead of unplanned consumption simply for cheap prices. Thus, eco-friendly food companies need to develop marketing strategies in line with consumer needs. Also, as for 'flavor' and 'expiration date' to be chosen by consumers who seek fresher and safer higher-quality foods unlike in the past when people sought foods for survival, it is necessary to pay extra attention to and invest in the original attributes of eco-friendly foods.

As for the IPA results by group, gender differences were found in the perspectives on eco-friendly food selection, which suggests marketing strategies need to be differentiated in accordance with the gender of those who purchase eco-friendly foods. Specifically, satisfaction was low compared to importance in 'price', 'flavor' and 'date of manufacture' in males, whereas in not only 'flavor' but also 'food additive status' and 'expiration date' in females which suggests the need for improvements. As for the IPA results by age, satisfaction was low compared to importance in 'price', 'flavor' and 'expiration date' in the > 40 y.o. group, whereas in 'eco certification', 'food additive status', 'freshness', 'expiration date' and 'date of manufacture' factors in the ≥ 40 y.o. group, which suggests the need for improvements. Lastly, as for the analysis results by monthly income, satisfaction was low compared to importance in 'food additive status', 'price', 'flavor' and 'expiration date' in the < KRW 3M group, whereas the \geq KRW 3M group showed high importance but low satisfaction in 'price' and 'expiration date' which suggests the need for improvements.

Despite the implications derived from the analysis of all respondents and differences by gender, age and monthly income in view of the specific selection attributes of eco-friendly foods, the findings of this study have some limitations, which should be addressed in future studies. First, given the subjects of this study were limited to some eco-friendly food purchasers in Seoul and metropolitan areas, the findings cannot be generalized. Thus, future studies need to include other regions and consider regional characteristics. Second, in measuring importance and satisfaction, this study asked consumers to associate their frequently purchased eco-friendly foods with each factor. Therefore, the findings are prone to biases in preference or involvement, which need to be properly controlled for in future studies.

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