

Comparison of Ginseng Product Consumers Based on Processed Type of Ginseng*

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Abstract This study aims to analyze the differences of ginseng product consumers and segment Korean fresh ginseng and red ginseng root markets based on attributes for the purchase. As a result of analyzing survey data, the red ginseng root consumers had different aspects from fresh ginseng consumers. According to the result of cluster analysis, the fresh ginseng consumers were subdivided into three segments (safety-oriented consumption cluster, label centered consumption cluster, and high involvement consumption cluster), while the red ginseng root consumers were subdivided into four segments (convenience-oriented consumption cluster, high involvement consumption cluster, raw material's safety-oriented cluster, and raw material's information importance cluster). ANOVA and Crosstab were conducted to investigate characteristics of each cluster.

Keywords Fresh Ginseng, Red Ginseng Root, Market Segmentation, Cluster analysis

1 Introduction

It is anticipated that our country will enter an aging society since 2000 and will be an aged society in 2017 and a super-aged society by 2026 (Statistics Korea, 2010). Along with the accelerated aging phenomenon, the health functional food market is also sharply expanded. The health functional food market was 685.6 billion won in 2005 and one trillion and 409.1 billion won in 2012, showing an annual average increase of 9.42% (Ministry of Food and Drug Safety, 2006, 2013). Based on the domestic sales records of health functional food in 2012, red ginseng ranked top with the sales of 648.4 billion won and ginseng also ranked seventh place with the sales of 45 billion won; thus, the ginseng products largely occupied the domestic health functional food market. It showed an annual average increase of 16.4% of red ginseng, and 2.7% of ginseng, with the prospect of constant growth in the future (Ministry of Food and Drug Safety, 2006, 2013).

A variety of studies were conducted on ginseng products according to the market growth, but most of them focused on the effectiveness and the R&D of the ginseng products. Only few focused on the marketing and the consumer of the ginseng products (e.g., Park, Cho, Pyee, & Hong, 2006; Kim & Park, 2011). Studies focusing on marketing and consumers were classified into three types: investigation of the current status of domestic ginseng industry and suggestion of an improvement plan (Lee & Lee, 2010; Seoul National University, Department of Agricultural Economics and Rural Development, 2006), secondly, suggestion of an export strategies and investigation of the overseas markets (e.g., Myeong-hwan Seong, Dong-pil Lee, Song-soo Lim & Won-jin Lee, 2004; Parker, 2011; Baeg & So, 2013), and lastly, investigation

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of the domestic ginseng brands and consumers (e.g., Jang, Park, Cha, & Yoon, 2011; Lee, Yu, Jeong, Moon, & Jung, 2012). However, only few studies on ginseng consumers have been conducted but it became important to understand the characteristics and the behaviors of the consumers for a long-term development of the ginseng industry.

Moreover, studies on various consumption patterns of ginseng products were demanded. According to the processed types and methods, ginseng was categorized into various products such as unprocessed fresh ginseng or red ginseng, *taekuksam*, or white ginseng; and the consumption patterns also varied accordingly. In 2013, ginseng was the most consumed as fresh ginseng (34.8%) and in order of processed goods of red ginseng (31.8%) and red ginseng roots (30.0%) (Ministry of Agriculture, Food and Rural Affairs, 2014). In other words, main class of consumers, purchasing goals, selective attribution and more could differ according to each processed type of ginseng. According to Sung, Lee, Kim, & Suh (1989), it was found that preferences of different ginseng products varied according to the age of consumers or the dosage forms, however, a specific consumer preference research based on the processed types was not conducted yet. Thus, it was necessary to investigate if the consumers' characteristics and behaviors varied according to different consumption patterns, and if so, one needed to find what the differences were.

The goal of this study is to practically analyze the differences between the consumers of the unprocessed fresh ginseng and those of the processed red ginseng roots and

to segment consumer groups to draw implications of the marketing strategies according to each segmented group. This study especially examines the consumers who purchase the fresh ginseng and the red ginseng roots which are consumed most among them. In case of processed red ginseng products, various types of processed products are sold in the market and hence another difference will occur accordingly, so this study excludes processed red ginseng products but focuses on the red ginseng roots products.

Lee, Yu, Jeong, Moon, & Jung (2012) segmented the fresh ginseng consumers in their research. Information regarding fresh ginseng was taken from the study above for comparison with the case of red ginseng roots. Target survey of the red ginseng root consumers is segmented and also separately analyzed for a comparison with the results of Lee, Yu, Jeong, Moon, & Jung (2012).

2 Theoretical Background

2.1 Literature Review on Ginseng Consumers

Literature review was conducted on the domestic and foreign consumers of ginseng product (Table 1). The first category of the prior studies focused on the consumption pattern of ginseng products in pursuit of establishing an export strategy, and to examine the preference of different ginseng products for a possible overseas market.

Table 1 Precedent Studies on the Domestic and Foreign Consumers of the Ginseng Product

Item	Researcher	Key Point
Foreign Ginseng Consumption Pattern Analysis	Newtree. Co., Ltd. (2010)	Established production plan for customized ginseng products according to consumption patterns of Korean ginseng in America, Europe, and South-East Asia markets
	Jeong, Park, Ko, Cho, & Im(2005)	Investigated consumption pattern and the awareness of ginseng consumers in overseas market (Korea, US, Hong Kong, China, Japan, and Taiwan) regarding the ginseng products
Sensory Evaluation of the Processed Ginseng Products	Chung, Hong, Kim, Cho, Moskowitz, & Lee (2011)	Conducted a sensory evaluation and examined the acceptance of processed ginseng products by the consumers in US market
	Chung, Lee, Rhee, & Lee (2011)	Examined the attitudes and expectations of the US consumers regarding the processed ginseng products and found an appropriately processed type with a growth potential in US market
	Yoon, Hong, Lê, & Kim (2011)	Conducted a reception study and sensory evaluation of the domestic consumers according to the processed types of red ginseng extracts
Domestic Ginseng Consumption Pattern Analysis	Jang, Park, Cha, & Yoon (2011)	Investigated the consumer preference of organic ginseng products and suggested direction of settlement for the organic ginseng products
	Kim et al. (2011)	Investigated the preference, awareness, and intakes of ginseng for the target of patients with diabetes and high blood pressure diseases
	Kim & Han (2005)	Investigated the differences in awareness of ginseng and ginseng products between the college students and middle-aged class.
	Lee & Lee (2010)	Evaluated consumption patterns and the processed ginseng product consumers

Data : Summary of the key points based on the literature review

Newtree. Co., Ltd. (2010) investigated the consumption patterns of Korean ginseng in America, Europe, and South-East Asia and established a production plan according to the demand found from the surveys. Jeong, Park, Ko, Cho, & Im (2005), Pi (2004), and Park (2006) investigated the consumption patterns of ginseng products and the awareness of Korean ginseng products among the foreign consumers.

Chung, Hong, Kim, Cho, Moskowitz, & Lee(2011) and Chung, Lee, Rhee, & Lee(2011) examined the attitudes and expectations of the US consumers concerning the processed ginseng products and found an appropriate processed type with the growth potential by using a sensory evaluation and a conjoint analysis. These studies were signified for their development of processed productions and for the sensory evaluation of the consumers overseas.

Most of the studies targeting the domestic ginseng consumers also focused on the consumption patterns and product preferences. Yoon, Hong, Lê, & Kim(2011) and Jang, Park, Cha, & Yoon(2011) performed a sensory evaluation to investigate consumer preference of different ginseng products such as organic ginseng productions or various processed ginseng products. Kim et al. (2011) examined consumption patterns of specific consumer groups such as diabetes and high blood pressure patients.

As the focus of the precedent studies of ginseng consumers were on the ‘ginseng products’ and ‘ginseng markets,’ a variety of ginseng products according to different processed types were not considered. In the studies that aimed at ginseng product consumers, various selective attributes of the product were not sufficiently covered, and the selective attributes according to each stage of cultivation, processing, and sales were not systemized by each level or some were confused, which showed limitations of the studies. Therefore, the changes in ginseng products according to processed type should be more considered on a micro view, and the selective attributes in each ginseng product should be systemized in the studies of ginseng market.

2.2 Literature Review on Ginseng Market Segmentation

Even though the market segmentation studies, not only on ginseng but also on agricultural products, were actively conducted (Song & Lee, 2009; Lee, 2009), studies on the segmented markets—which changed according to the processing of the fresh agricultural products—were still insufficient. The characteristics of fresh food, such as ginseng, changed in its character according to each stage of processing, however, only few studies were conducted on the segmentation of markets of such change. Field (1999) segmented the domestic and foreign groups in college and compared their travel behaviors according to each group; it could be the example of comparison study for the segmented groups with differences.

Among the studies on ginseng product consumers, studies on the segmented markets of ginseng products to understand the consumer’s characteristics and behaviors were shown in the <Table 2>. Regarding the studies on the domestic ginseng market, Sung, Yang, Jeon, Kim, & Kim(1989), Sung, Lee, Kim, & Suh(1989), and Sung, Jeon, Lee, & Yang(1989) suggested the necessity of categorizing the consumer groups and conducted studies with three groups: housewives, college students, and special agents in ginseng. Im, Ko, Jeong, & Kim(2005) segmented the ginseng market into seven categories using a ‘tree decision analysis’ to suggest marketing strategies of ginseng products according to the segmented markets. With respect to the studies on the overseas ginseng markets, Park(2006) performed studies on the segmented ginseng markets in Japan and America with seven selective attributes of ginseng products such as the place of origin and price, with ten variables such as the product purchasing frequency, age, and income. Kim, Lee, Yi, & Hong(2011) classified the consumer groups using price, safety authentication, and size.

Table 2 Precedent Studies on Domestic and Overseas Market Segmentation in Relation to this Study

Item	Researcher	Key Point
Comparison of Segmented Markets and Segmentation of General Agricultural Product Markets	Field (1999)	Segmented the domestic and foreign groups in college and compared their travel behaviors according to each group
	Song & Lee (2009)	Evaluated the preferences by conjoint analysis with the attributes of brand, price level, distribution channel; and segmented the three consumer groups with cluster analysis targeting the consumers of eco-friendly agricultural products
	Lee (2009)	Derived nine consumer groups of rice consumers based on the property index and preferences to rice, demographic characteristics, and purchase behaviors by using the SOM model

Segmentation of Ginseng Market	Sung et al. (1989a) ; (1989b) ; (1989c)	Divided housewives, college students, and special agents in ginseng into groups and surveyed the preference to ginseng products according to the groups
	Im, Ko, Jeong, & Kim (2005)	Segmented the consumption patterns of domestic consumers for ginseng products in utilization of the tree analysis and suggested marketing strategies according to the segmented markets.
	Park (2006)	Analyzed production-import and export trends of Japanese and American ginseng and consumption patterns according to the segmented consumers
	Kim, Lee, Yi, & Hong (2011)	Derived effectiveness based on the conjoint analysis for GAP ginseng consumers and formed three groups according to the preference scores of price, safety authentication, and size

Data : Summary of the key points based on the literature review

The precedent studies did not fully classify the process into types such as ‘fresh ginseng’ or ‘red ginseng roots.’ Based on a wholesome general consumer samples, the dosage form was asked or confusion was created by the linear placement of fresh ginseng, red ginseng root, and white ginseng with the processed products such as powder, drink, and extract. Therefore, the fact whether the consumption pattern changed according to processed types or not was not verifiable.

Besides, the market segmentation lacked in connectivity between the consumer patterns and the ginseng products themselves. A few studies were conducted after grouping, and other few were segmented according to the attributes that were not the characteristics of the ginseng products such as the manufacturing company or the involvement of the others. A study on the market segmentation in consideration of ginseng products themselves was conducted for purchase conducted with the foreign consumers. In case of studies on domestic consumers, as we criticized about the precedent studies on the ginseng consumers, rather than considering the various characteristics of ginseng products, they only investigated fragmentary characteristics of ginseng products.

The precedent studies on ginseng consumers as referred in 2.1, and the studies on ginseng market segmentation in this paragraph were summarized as follows: the studies on the existing ginseng market and consumers did not analyze various ginseng products such as the fresh ginseng, red ginseng root, and processed red ginseng products, and the systemicity of the selective attributes with regard to the ginseng products was insufficient. Also, the necessity of ginseng market segmentation was recognized very early, however, studies on domestic consumption market still lacked. Moreover, consideration for the studies on consumption market according to each processing level of products were not enough either.

Meanwhile, based on the consideration of the precedent studies, Lee, Yu, Jeong, Moon, & Jung (2012) conducted

a frequency analysis and descriptive quantitative analysis with the survey results of the fresh ginseng consumers, and conducted market segmentation for the fresh ginseng consumers through factor analysis and cluster analysis. According to the results of factor analysis, the selective attributes of the fresh ginseng consumers were condensed into three factors: physical characteristics, safety, and cultivation information indication, and accordingly the fresh ginseng consumers were segmented into three groups of safety-oriented consumption cluster, label centered consumption cluster, and a high involvement consumption cluster. Lee, Yu, Jeong, Moon, & Jung (2012) segmented the ginseng product groups and focused on a fresh ginseng product, and then theoretical and practical implications were concluded by segmenting the consumers. As mentioned in the introduction, the characteristics of ginseng products changed at each level of processing, and the study of Lee, Yu, Jeong, Moon & Jung (2012) was limited in the fact that they only targeted fresh ginseng consumers. Thus, to redeem the limitation, this study is conducted on and analyzed with the results of Lee, Yu, Jeong, Moon, & Jung (2012).

3 Method

3.1 Measuring Variables

The questionnaires were composed of five fields: purchase pattern, selective attribute, behavior after purchase, VALS (Value and Lifestyle), and demographic characteristics. The purchase pattern section was composed of ten questions such as reason, place, and frequency of purchase.

The selective attributes of fresh ginseng and red ginseng root included 17 questions for characteristics in cultivating stages (variety, cultivation period, and etc.), physical characteristics (weight, thickness, color, and etc.), and information indication (product authentication, nutrition in-

formation, quality class, and etc.) of red ginseng roots including additional two items, measured by the 5-points Likert scale (1=never considered, 5=very considered).

Procedures to compose the selective attributes were as follows: the selective attributes were chosen through literature review in reference to the study of the ginseng consumers. Jeong, Park, Ko, Cho, & Im (2005) classified the consideration of purchase factors into place of origin, price, packaging design, packaging unit, medicinal properties, scent, and taste. Lee & Lee (2010) suggested that price, nutrition contents, scent-color, domestic raw material, manufacturing company-brand, reputation, food safety, new packaging-new product, benefits and effects, taste, variety of products, eco-friendly cultivation of the raw material, selling agent-place, convenience, certification mark, and the area of production to be the characteristics of ginseng products to distinguish the importance of each characteristic. The selective attributes above were systemized and additional selective attributes in the stage of cultivation were derived through numerous face-to-face talks with the specialists of a regional agricultural technology center in R&D of ginseng. These were systemized again into three categories of characteristics in the stages of cultivation, physical characteristics, and an information indication.

Westbrook (1987) and Kim, Choi, & Kwon (2009) composed three questions of satisfaction, intention of repurchase, and intention of recommendation to measure the behavior after the purchase, and then VALS measuring equipment was used to examine the characteristics of consumer's lifestyle and value. Lastly, demographic characteristics were investigated.

3.2 Data Collection and Analysis Method

The survey targeted 20-years or older consumers with the experience of purchasing red ginseng roots within a year. This survey was performed online in May 2012, as the Lee, Yu, Jeong, Moon, & Jung (2012) conducted their survey targeting the fresh ginseng consumers. 214 copies of questionnaires out of 250 copies of collected questionnaires were used in the analysis, excluding the questionnaires having missing value of the selective attributes.

Practical analysis was conducted by utilizing the SPSS 18.0 program. Frequency analysis and descriptive quantitative analysis were conducted to understand the characteristics of the investigated data, and factor analysis was conducted to derive the major dimension of the variables of the selective attributes. Principal component analysis and

varimax rotation method were used.

Based on the derived factors, cluster analysis was conducted in order of hierarchical method and a non-hierarchical method to classify and categorize each group of consumers with the same quality. One-way analysis of the variance and post-hoc test (Duncan) were performed for assessment of suitability and discriminant analysis was conducted to derive the most discriminating factor for differences between the clusters. Lastly, for the cluster analysis, chi test, one-way analysis of variance, and t-test were performed to understand the differences between the demographic characteristics, purchase patterns, and behaviors after the purchase according to the segmented groups.

4 Result of Analysis

4.1 Characteristics of the Survey Target

The frequency analysis was conducted to examine the demographic characteristics of the survey targets (Table 3). Questionnaires regarding the fresh ginseng in the frequency analysis were taken from the study of Lee, Yu, Jeong, Moon, & Jung (2012). More females responded to the fresh ginseng questionnaires than males (44.8%) with the occupancy of 55.2% (138 persons). But more male respondents were found for the red ginseng roots questionnaires than females by 53.6%. The age dispersion of fresh ginseng was mostly occupied by the 50s with 49.6%, but the dispersion for red ginseng roots were comparatively even. According to the questionnaires of the fresh ginseng and the red ginseng root, married persons largely occupied 88.8% and 72.2% and college students and alumni occupied 64.0% and 70.4% respectively. The monthly average household income of both groups were around 4-5.99 million won, largely occupying 35.6%. The residential areas were mostly in the capital area (59.2%, 55.6%), and the occupation of the consumers were largely occupied in order of salaried men with 44.4% and 50.4%, and housewives with 24.8% and 19.6%.

Table 3 Demographic Characteristics of Respondents of Fresh Ginseng (n=250) and Red Ginseng Root (n=250)

Variables	Item	Fresh Ginseng		Red Ginseng Root		Variables	Item	Fresh Ginseng		Red Ginseng Root	
		n	%	n	%			n	%	n	%
Gender	Men	112	44.8	134	53.6	Education	Less than Middle School Education	1	0.4	1	0.4
	Women	138	55.2	116	46.4		High School Diploma	66	26.4	42	16.8
Ages	20s	5	2.0	32	13.2		College Students / Bachelor's Degree	160	64.0	176	70.4
	30s	50	20.0	72	28.8		Graduate Students/ Master's Degree	23	9.2	31	12.4
	40s	71	28.4	68	27.2	Residential Area	Capital Area (Seoul Gyeonggi Incheon)	148	59.2	139	55.6
	50s	124	49.6	77	30.8		Metropolitan City (Excluding the Capital Area)	51	20.4	67	26.8
Marital Status	Single	28	11.2	57	22.8		Provinces	51	20.4	44	17.6
	Married	222	88.8	193	77.2	Occupancy	Salaried men	111	44.4	126	50.4
Monthly Average Household Income	Under 2 Million won	15	6.0	17	6.8		Public Official	13	5.2	17	6.8
	2-3.99 Million Won	96	38.4	68	27.2		Self-employed	41	16.4	33	13.2
	4-5.99 Million Won	89	35.6	89	35.6		Student	2	0.8	13	5.2
	6-7.99 Million Won	33	13.2	46	18.4		Housewife	62	24.8	49	19.6
	Over 8 Million Won	17	6.8	30	12.0		Others	21	8.4	12	4.8

4.2 Analyzing Differences Between the Fresh Ginseng and Red Ginseng Root Consumers

Analyses were conducted to investigate whether there were differences between the consumer groups according to the processed types of ginseng products as follows: The chi-square test (Table 4) and t-test (Table 5) were conducted for the demographic characteristics and purchase patterns to find out whether there were occurred actual differences between the fresh ginseng and red ginseng root

consumers in advance. The data of the fresh ginseng consumers were analyzed based on the results of the study performed by Lee, Yu, Jeong, Moon, & Jung(2012). As the result of the analysis, the female rate and ages of the fresh ginseng consumers were higher than the red ginseng root consumers. The level of academic abilities of the red ginseng root consumers was higher than the fresh ginseng consumers, and single rate was higher and the housewives rate was lower among the red ginseng root consumer than the fresh ginseng consumers ($p < .05$).

Table 4 Chi-square Test Results with the Variables of Demographic Characteristics and Purchase Patterns

Item		Fresh Ginseng n (%)	Red Ginseng Root n (%)	Total n (%)	χ^2
Gender	Men	112 (44.8)	134 (53.6)	246 (49.2)	3.873*
	Women	138 (55.2)	116 (46.4)	254 (50.8)	
	Total	250 (100)	250 (100)	500 (100)	
Education	High School Graduates	65 (26.2)	42 (16.9)	107 (21.5)	6.889*
	College Students / Bachelor's Degree	160 (64.5)	176 (70.7)	336 (67.6)	
	Graduate Students / Master's Degree	23 (9.3)	31 (12.4)	54 (10.9)	
	Total	248 (100)	249 (100)	497 (100)	
Marital Status	Single	28 (11.2)	57 (22.8)	85 (17.0)	11.786***
	Married	221 (88.8)	193 (77.2)	414 (83.0)	
	Total	249 (100)	250 (100)	499 (100)	
Occupancy	Salaried men	111 (44.6)	126 (50.4)	237 (47.5)	14.176*
	Public Official	13 (5.2)	17 (6.8)	30 (6.0)	
	Self-employed	41 (16.5)	33 (13.2)	74 (14.8)	
	Student	2 (0.8)	13 (5.2)	15 (3.0)	
	Housewife	61 (24.5)	49 (19.6)	110 (22.0)	
	Others	21 (8.4)	12 (4.8)	33 (6.6)	
	Total	249 (100)	250 (100)	499 (100)	
Purchasing Root Year (age of the root)	3 Year Root	14 (6.3)	19 (8.8)	33 (7.5)	7.598 (p=.055)
	4 Year Root	20 (8.9)	32 (14.7)	52 (11.8)	
	5 Year Root	43 (19.2)	50 (23.0)	93 (21.1)	
	6 Year Root	147 (65.6)	116 (53.5)	263 (59.6)	
	Total	224 (100)	217 (100)	441 (100)	
Expected Effect for Fatigue Recovery	Yes	100 (40.2)	130 (52.0)	230 (46.1)	6.767**
	No	149 (59.8)	120 (48.0)	269 (53.9)	
	Total	249 (100)	250 (100)	499 (100)	
Expected Effect for Disease Prevention	Yes	12 (4.8)	24 (9.6)	36 (7.2)	4.310*
	No	237 (95.2)	226 (90.4)	463 (92.8)	
	Total	249 (100)	250 (100)	499 (100)	

*p<.05, **p.01, ***p.001

Table 5 T-test Results between Consumers According to the Purchase Behaviors

Variables of Purchase Behaviors	Average of Fresh Ginseng Consumers	Average of Red Ginseng Root Consumers	p
Average Purchase Amount per 1 time (won)	124,668	203,888	.000***
Purchasing Root Year (Year)	5.21	5.44	.011*

*p<.05, **p.01, ***p.001

Regarding the purchase behaviors, the result showed significant differences in purchasing root year per week, the cost of per purchase, the average years-old roots purchased, and the expected effects on fatigue recovery and disease prevention. The purchasing rate for 3 to 5-year-old root of the fresh ginseng consumers was higher than the red ginseng root consumers ($p=.055$). With respect to the red ginseng root consumers, the expectations for fatigue recovery and disease prevention were higher than the fresh ginseng consumers ($p<.05$), and the purchasing rate of six-year old root ($p=.055$) and as well as the purchasing average root year was higher ($p<.05$). Also, the cost of per purchase of the red ginseng root consumers was higher

than the fresh ginseng consumers ($p<.001$).

Regarding the product's selective attributes, the t-test was conducted for the items of the selective attributes to investigate the differences between the fresh ginseng and red ginseng root consumers, and according to the results, many items showed significant differences (Table 6). The fresh ginseng consumers considered the information indication more than the red ginseng root consumers ($p<.05$). Meanwhile, the red ginseng root consumers considered physical characteristics such as weight and thickness of the product more important than the fresh ginseng consumers ($p<.05$).

Table 6 T-test Results Between Consumers According to the Variables of the Selective Attributes

Category of Selective Attributes	Selective Attributes	Average of Fresh Ginseng Consumers	Average of Red Ginseng Root Consumers	p
Cultivation Stage Information	Heavy Metal/Soil/Water Examination Pass-fail	4.22	4.10	.166
	Residual Pesticide Examination Pass-fail	4.37	4.33	.554
	Production Area Name (Punggi, Geumsan, and etc.)	4.14	4.18	.566
	Varieties	3.96	3.85	.215
	Cultivation Period (3-year old root, 6-year old root)	4.31	4.39	.191
	Cultivator and Farm Information	3.82	3.69	.173
Physical Characteristics Information	Weight	3.99	4.14	<.05*
	Thickness	4.04	4.21	<.01**
	Color	4.02	4.15	.059
	Scent	3.99	4.16	<.05*
	Shape (Form)	3.98	4.14	<.05*
Information Indication	Price	4.38	4.49	<.05*
	Product Certification Mark (GAP, Organic, Eco-friendly Certification)	4.23	4.07	<.05*
	Nutrition Information Indication (Saponin, Amino Acid, and etc.)	4.12	3.91	<.01**
	Quality Class (Extra-large, Large, Medium, Small)	4.32	4.21	<.05*

* $p<.05$, ** $p.01$, *** $p.001$

4.3 Factor Analysis of the Selective Attributes

Lee, Yu, Jeong, Moon, & Jung(2012) derived three factors of physical characteristics, safety, and cultivation in-

formation from the selective attributes. The physical characteristic factors contained four exterior characteristics of color, shape, thickness, and scent, and the safety factor included test of pass-fail for the cultivation environment,

residual pesticide, and the product certification indication such as GAP certification and. The cultivation information factor contained the items of varieties, local brand names, and quality classes.

In this study, the factor analysis was performed to investigate the dimension of the selective attributes of the red ginseng root. 11 items were analyzed, excluding four items of cross-loadings and other four items with low trust. Using

the principal component analysis and the varimax rotation method, the factors with more than 1.0 eigenvalue were individually extracted. Total variance explanation power was 62.532%, and the KMO value was .842, Bartlett's sphericity test was shown as $\chi^2=833.670$ (.000), validating the data in the factor analysis. The Cronbach's alpha, internal consistency trust according to the factors, was 0.612-0.832 to obtain trust.

Table 7 Factor and Trust Analyses Results According to the Variables of the Red Ginseng Root Selective Attributes

Factor Name	Variables of Factors	Factor Loadings	Eigen Value	Variance Explanation Power (%)	Cronbach's alpha
Physical Characteristics Factor	Weight	.725	4.538	41.253	0.820
	Scent	.715			
	Thickness: 10, 15, and 20 ji and etc.	.704			
	Shape: Form of Root and the End of Ginseng	.686			
	Color	.672			
	Processing Period	.539			
Cultivation Raw Material's Information Factor	Production Area Name of Raw Material: Punggi, Geumsan, Gaeseong, and etc.	.775	1.301	11.827	0.696
	Cultivator of Raw Material and Farm Information	.767			
	Variety of Raw Material	.677			
Raw Material's Safety Factor	Residual Pesticide Test Pass-fail for Raw Material	.890	1.040	9.452	0.828
	Heavy Metal/Soil/Water Examination Pass-fail for the Environment of Raw Material	.860			

The items of the selective attributes of the red ginseng root were condensed into three factors of physical characteristics, raw material's safety, and raw material's cultivation information (Table 7). In the first factor, variables of the weight, scent, thickness, shape of root and the end of ginseng, color, and the processing period were loaded, and thus it was called the physical characteristic factors in reflection of the common characteristics that were relevant to the exterior appearance of the red ginseng root. In the second factor, factors of the environment examination (heavy metal, soil, and water) pass-fail for the cultivated area of the raw material (fresh ginseng) and the residual pesticide test pass-fail were loaded to be called the raw materials' safety factor. In the third factor, the variables of raw material's (fresh ginseng) production area, cul-

tivator and farm information, and varieties were loaded to be called the raw material's cultivation information based on the common ground that the information was obtained in cultivation. The third factor of the fresh ginseng could be connected to the cultivation information factor.

The 'physical characteristic factor' of the red ginseng root was different from the 'physical characteristics factor' of the fresh ginseng with the addition of variables of weight and cultivation period. The 'safety factor' of the fresh ginseng included the variable of the residual pesticide pass-fail test and also the variables of product certification mark such as eco-friendly or GAP were additionally included. The 'cultivation information factor' of the fresh ginseng included variables of the varieties, area name, cultivation period, and quality class while the 'raw material's

cultivation information factor' of the red ginseng root was composed of the variables of the area name, varieties, and cultivating farm information.

4.4 Cluster Analysis of the Selective Attributes

Cluster analysis was conducted to segment the red ginseng root consumers in consideration of the same quality of selective attributes on the basis of selective attributes factors previously derived by factor analysis. To determine the number of clusters, a stopping rule was applied using the hierarchical method. According to the stages presented by the agglomeration schedule, the value of cohesion coefficient was increased; the stopping rule meant to stop

the agglomeration right before the stage in which the rate was sharply increases (Lee & Im, 2009). <Table 8> partially showed the last stage of the dramatic fluctuation where the cohesion coefficient begins to sharply increase from the stage 208.

Then, k-means cluster analysis was performed where 5, 4 and 3 clusters are combined for the test. The final determination was four clusters because the difference was the most significant when the test was conducted with four clusters. To verify the differences among the clusters, one-way analysis of variance was conducted with the factor scores of the clusters and also the Duncan test was used for post verification (Table 9). As the result of the analysis showed, there were significant differences among the segmented clusters at the level of $\alpha=0.001$.

Table 8 Fluctuation Analysis of Cohesion Coefficient

Stage	Number of Cluster	Cohesion Coefficient	Fluctuation Rate of Cohesion Coefficient (%)
∴	∴	∴	∴
206	8	6.171	6.5%
207	7	6.891	11.7%
208	6	8.659	25.7%
209	5	10.404	20.2%
210	4	13.305	27.9%
211	3	13.568	2.0%
212	2	14.326	5.6%
213	1	20.955	46.3%

Table 9 Validation for Differences According to the Selective Attributes of the Red Ginseng Root

Classification	Cluster A (n=34)	Cluster B (n=66)	Cluster C (n=50)	Cluster D (n=64)	Remarks
Physical Characteristics Factor***	-0.2107	0.9942	-0.1557	-0.7917	D<A, C<B
Raw Material's Cultivation Information Factor***	-0.4690	0.4410	-1.1047	0.6575	C<A<B,D
Raw Material's Safety Factor***	-1.5623	0.1708	0.7579	0.0617	A<B, D<C

*** Significant at the level of $p<0.001$

The physical characteristic factor was the most considered by cluster B and least considered by cluster D ; the raw material's cultivation information factor was the most considered by cluster B and D. The raw material's safety factor was the most considered by cluster C.

Among the three selective attribute factors, the discriminant analysis was conducted to derive the factor with a big impact on the cluster (Table 10). According to the result, three types of discriminant functions explaining 42.6%, 35.6%, and 21.8% in the total variance were stat-

istically significant. According to the result of the examination of the discrimination through a structural matrix between the factors, the raw material's safety factor showed the highest level of contribution in the first discriminant function, the raw material's cultivation information factor

in the second discriminant function, and the physical characteristics factor in the third discriminant function. As the accuracy of classification was 97.7% on average, the trust of this analysis was considered to be high.

Table 10 Discriminant Analysis Result for the Clusters of the Red Ginseng Root Consumers According to the Stage

Relation of the Discriminant Function and Factor							
Expectation Factor	Stage	Lambda Value by Stages	1	2	3	F (3,210)	Rate of Accurate Classification of Cases (%)
Raw Material's Safety Factor	1	.465***	.766*	-.143	.627	80.410	97.7%
Raw Material's Cultivation Information Factor	2	.225***	-.202	.792*	.576	77.110	
Physical Characteristics Factor	3	.109***	.492	.533	-.688*	83.787	
Eigenvalue			1.427	1.191	.731		
Variance Explanation (%)			42.6	35.6	21.8		
Canonical Correlation			.767	.737	.650		
Lambda Value			.109***	.264***	.578***		

*** Significant at the level of $p < 0.001$

4.5 Characteristics of Clusters

The characteristics of the clusters of the red ginseng root consumers were shown in the <Table 11>. Cluster A of the red ginseng root consumers assigned a low importance to the three factors derived. In comparison with the other clusters, the rates of internet or home-shopping purchase were high, as well as the purchase of a certain brand, hence a convenience-driven characteristic was implied, and it was called the 'convenience-oriented consumption cluster.' As the smallest group (15.0%), the rates of males and females were similarly distributed and the average age was 40.7 years old. The number of persons having a monthly average household income of 4-5.99 million won were distributed (41.2%), and the rate of housewives was lower than the other clusters (14.7%). The main purpose of purchasing the red ginseng root was for the intakes of their families, and the rate of purchase through the internet and home-shopping was high (26.5%) and through specialty stores was comparatively low (5.9%). The rate of purchasing the top brand of 'Cheong Kwan Jang' in the domestic market was higher than the other clusters (78.1%), and the rate of purchasing the six-year-old root was also high (74.2%).

Cluster B of the red ginseng root showed high importance to all three factors, and hence it was considered

to be similar with the 'high involvement consumption' type, and it was called, the 'high involvement consumption cluster.' It was the biggest group (30.8%) with an even distribution of males and females, and the average age was 43.3 years old, which was higher than the other clusters. Based on the results of one-way analysis of the variance in the VALS scale, the high involvement consumption cluster of the red ginseng root showed interests in controversies more than the other clusters, preferred thrills and lots of changes, or had leadership to organize a meeting. Also, the rate of the purpose of purchase for personally intake was higher than the other clusters (27.3%). The rates of purchase through the specialty store and traditional market and purchasing 4-5 year old root were very high. Also, the rate of purchasing less than 200 thousand won (52.0%) and the behaviors after purchase were more positive than the other clusters. The repurchase rate and recommendation intention were significantly higher than the other clusters.

Cluster C of the red ginseng root emphasized a raw material (fresh ginseng)'s safety factor as important, and it was called the 'raw material's safety-oriented clusters.' The rate of females was a little high (54.0%), and the average age was 40.5 years old, showing the youngest age distribution. The rate of the household income was more than eight million won which was higher than the other clusters, and the rate of purchase for a gift (20.0%) was

comparatively higher. The rate of purchase at the department store and a large-scale discount store (30.0%) was high and the average purchase amount was also more than 200 thousand won per purchase (52.0%).

Cluster D of the red ginseng root considered the raw material's cultivation information as an important factor, and it was called the 'raw material's cultivation information importance cluster.' The rate of male (62.5%)

was high and the average age was 41.0 years old. The household income of 2-3.99 million won (31.3%) occupied more than other clusters, and the rate of salaried men (39.1%) was low but the rate of students (9.0%) was high. As the same as the raw material's safety-oriented cluster, the rate of purchase for gift (20.0%) was much higher and purchases were made at comparatively various places.

Table 11 Verification of Differentiation According to the Selective Attribute Types of the Red Ginseng Root

Classification		Convenience-oriented Consumption Cluster (n=34)	High Involvement Consumption Cluster (n=66)	Raw Material's Safety-oriented Cluster (n=50)	Raw Material's Information Importance Cluster (n=64)	
Rate (%)		15.0	30.8	23.4	29.9	
Demographic characteristics	Men	50.0	50.0	46.0	62.5	
	Women	50.0	50.0	54.0	37.5	
	Ages (years old)		40.7	43.4	40.5	41.0
	Monthly Average Income	Less than 2 Million Won	5.9	3.0	4.0	12.5
		More than 2-3.99 Million Won	26.5	24.2	22.0	31.3
		More than 4-5.99 Million Won	41.2	36.4	44.0	28.1
		More than 6-7.99 Million Won	11.8	21.2	12.0	21.9
		Over 8 Million Won	14.7	15.2	18.0	6.3
	Occupancy	Salaried man	52.9	56.1	50.0	39.1
		Public Official	5.9	10.6	8.0	4.7
		Self-employed	17.6	9.1	10.0	18.8
		Student	2.9	0.0	6.0	9.4
		Housewife	14.7	19.7	22.0	20.3
		Others	5.9	4.5	4.0	7.8
VALS	Interest in Controversies**		3.26	3.70	3.42	3.33
	Pursuit of Thrills*		3.06	3.39	3.02	3.30
	Preference to Lot of Changes*		2.91	3.35	3.34	3.14
	Ability*		3.21	3.52	3.20	3.20
	Leadership**		3.24	3.58	3.22	3.14
	Preference to Organize a Meeting**		3.12	3.61	3.24	3.23
	Refined Clothes**		3.21	3.61	3.20	3.23
	The Latest Style of Clothes**		3.09	3.47	2.96	3.16
	Sensitive to the Trends**		3.06	3.35	2.82	3.16
	Pursuit of Freshness**		3.18	3.76	3.54	3.44

Purchase Pattern	Purchase Reason	Intakes of Oneself	20.6	27.3	18.0	18.8
		Intakes of Families	64.7	65.2	62.0	62.5
		Gift for Colleagues· Friends	14.7	7.6	20.0	18.8
	Purchase Place	Department Store· Large-scale Discount Store	23.5	22.7	30.0	25.0
		Traditional Market	29.4	28.8	22.0	18.8
		Specialty Store for Eco-friendly Health Food	5.9	24.2	22.0	23.4
		Internet Shopping Mall ·Home Shopping	26.5	9.1	14.0	6.3
		Others	14.7	15.2	12.0	26.6
	Brand	Cheong Kwan Jang	78.1	67.7	68.1	66.7
		Other Brands	21.9	32.3	31.9	33.3
	Purchasing Year Root	3 Year Root	6.5	0.0	4.5	13.8
		4 Year Root	6.5	12.7	6.8	6.9
		5 Year Root	12.9	28.6	20.5	17.2
		6 Year Root	74.2	58.7	68.2	62.1
	Purchase Amount on Average	Less than 100 Thousand Won per 1 Time of Purchasing	52.9	56.1	48.0	48.4
More than 100 Thousand Won per 1 Time of Purchasing		47.1	43.9	52.0	51.6	
Behavior after Purchase	Repurchase Intention*	3.68	4.02	3.74	3.83	
	Recommendation Intention*	3.41	3.83	3.68	3.63	

5 Conclusion and Implications

The purpose of this study was to investigate the differences in the characteristics of the fresh ginseng and the red ginseng root consumers according to the processed types of the ginseng products and derive the selective attributes that were significantly considered by each cluster of consumers and analyze the characteristics of the consumer clusters accordingly. And then, the selective attributes were considered important in purchasing raw materials of fresh ginseng and the processed red ginseng root products, and the target consumer groups were compared to suggest a possible direction for marketing strategies of each product.

The followings were the conclusions of this study: firstly, the fresh ginseng and the red ginseng root consumers

showed differences in the demographic characteristics and the purchase patterns of products. Also, regarding the selective attributes of the ginseng products, the fresh ginseng consumers considered information indication more and the red ginseng root consumers considered physical characteristics more than the other attributes. Therefore, for the ginseng products, there were differences in the characteristics of consumers according to the processing stages.

As for selective attributes of the red ginseng root, the three factors of physical characteristics, raw material's cultivation information, and raw material's safety were derived. Compared to the selective attributes of fresh ginseng as derived in the study of Lee, Yu, Jeong, Moon, & Jung(2012), the selective attributes of the fresh ginseng and the red ginseng root were condensed to similar factors,

but the differences in some of the included variables were found. The 'physical characteristics factor' of both products, the fresh ginseng and the red ginseng root, included the variables of the appearance, and the 'safety factor' and 'cultivation information factor' were composed of variety of information in regard of safety and procedure of cultivation for the fresh ginseng itself or the raw material of the red ginseng root. However, the 'physical characteristics factor' of the ginseng root included the factors of weight and processing period on top of the physical characteristic factor of the fresh ginseng. Also, the safety factor of the fresh ginseng included the factors of product certification mark factors such as eco-friendliness or GAP, which contrasted with the 'raw material's safety factor' of the red ginseng root. The 'raw material's cultivation information factor' of the red ginseng root included the cultivator and the farm information of the raw material. On the other hand, the cultivation information factor of the fresh ginseng included the cultivation period and the quality class. In other words, the variables that were significantly considered by the consumers were differentiated according to the consumer groups, and the marketing strategies should be established in consideration of the segmented groups of the fresh ginseng and the red ginseng root consumers to practically strengthen the attraction.

The results of the cluster analysis based on the selective factors of the fresh ginseng and red ginseng root consumers were significantly different. The fresh ginseng consumers were clustered into three groups of 'safety-oriented consumption cluster', 'label centered consumption cluster', and 'high involvement consumption cluster', while the red ginseng root consumers were grouped into four clusters of 'convenience-oriented consumption cluster,' 'high involvement consumption cluster', 'raw material's safety-oriented cluster', and the 'raw material's information importance cluster.' The safety-oriented consumption cluster of the fresh ginseng and the raw material's safety-oriented cluster of the red ginseng root and as well as the label centered consumption cluster of the fresh ginseng and the raw material's information importance cluster of the red ginseng root could be considered as the similar clusters. However, as the specific variables composing each factor were different, it was not appropriate to consider them as a homogeneous group. Also, as the convenience-oriented consumption of the red ginseng root was not found among the consumer group of the fresh ginseng, and it was assumed that the characteristics were easily found from the processed products.

Major marketing strategies for the segmented groups of the fresh ginseng and the red ginseng root were as follows:

Firstly, for the safety-oriented consumption cluster of the fresh ginseng and the raw material's safety-oriented cluster of the red ginseng root in which the consumers significantly considered the safety of the raw material (fresh ginseng), an appropriate information should be provided according to the selective attribute factors of each cluster. The safety should be sufficiently noticed in purchase by providing an objective and professional data such as reports for residual pesticide in regard of the safety of the agricultural foods (Lee, Yu, Jeong, Moon, & Jung, 2012). Furthermore, customized data with the focus on the product certification marks such as organic or GAP certification could be provided to the safety-oriented consumption group of the fresh ginseng.

Secondly, for the label centered consumption group of the fresh ginseng consumers, who significantly considered the information in the label such as Geumsan or six-year old root, the trust of the label needed to be increased. For example, a notice containing a self-diagnosis method for consumers could be provided to check the root of ginseng and the quality class with naked eyes (Lee, Yu, Jeong, Moon, & Jung, 2012), and the information regarding the cultivation period and the variety could be provided. Meanwhile, the raw material's information importance cluster of the red ginseng root was similar to the label centered consumption cluster of the fresh ginseng, but the red ginseng root consumers considered more of the information of the cultivation farm itself such as the cultivator and the farm information. In this case, trust could be raised by providing detailed information regarding the information of the manufacturer and the place of production in connection with the traceability.

Thirdly, as the high involvement consumption type of the fresh ginseng and the red ginseng root consumers had a higher repurchase and recommendation intentions more than other clusters, they should be targeted as the priority. The average ages of the high involvement consumption cluster of the fresh ginseng was 48.4 years old and the high involvement consumption cluster of the red ginseng root was 43.4 years old, implying that the ages were relatively higher than the other clusters, which meant the purchase experiences would be again comparatively higher. Also, as the class was inferred to have an active lifestyle with leadership, it was assumed that their word-of-mouth activities would be very vigorous (Richins & Root-Shaffer, 1988). Therefore, a variety of information and products should be fulfilled to activate the word-of-mouth activities for the fresh ginseng and the red ginseng root products, expanding the range of choice. Also, the product lineup would be as much as appropriate form in which the high

involvement consumption cluster could directly check the quality.

Fourthly, the convenience-oriented consumption cluster of the red ginseng root showed comparatively low importance to the three factors of the physical characteristics, raw material's cultivation information, and the raw material's safety. However, the cluster showed higher rate of purchasing through the internet and home-shopping and of purchasing Cheong Kwan Jang and six-year old root products that were generally known as a premium product than other clusters. Instead of unnecessary and excessive information, simple product explanation would be sufficient, and internet and SNS marketing would be appropriate in consideration of their low average ages as 40.7 years old.

This study showed distinction in the fact that we differentiated consumers according to processing levels of fresh foods through an investigation of the ginseng market. Ginseng products varied from the fresh form to processed types, but the existing researches did not consider such fact appropriately. This study implied that there were differences in the demographic characteristics and purchase patterns among the consumers of the fresh ginseng and the red ginseng root with the processed form. Also, this study was distinct by analyzing that consumer cluster analysis differed according to the processed types of ginseng by segmenting and differentiating the consumers of fresh ginseng and red ginseng root to compare the clusters of consumers.

With respect to the traceability of agricultural products that recently spread in the field of agricultural food, the lessons could be learned that the production information given should also varied according to each processing stage. The safety-oriented consumption and label centered consumption clusters of the fresh ginseng, and the raw material's safety centered and raw material's information centered clusters of the red ginseng root would be effectively applied by the traceability of agricultural product that had been supervised by the Ministry of Agriculture, Food and Rural Affairs since 2004. As the traceability of agricultural product was a system of recording-managing the information from the production to the distribution and the final consumption of the agricultural products, the safety of the agricultural foods could be secured and, if a problem occurred, the cause of the problem could be investigated to immediately take actions to solve it (Moon-bae Joo, 2011). The traceability of ginseng products was managed by Korea Ginseng Corporation and contractual farms by themselves, but recent system of the traceability of the ginseng products was established and was under the supervision of Ministry of Agriculture, Food and Rural Affairs

to secure trust and systemicity of the traceability. The traceability for the ginseng products began by a farm in the area of Geumsan in 2006, and it actively expanded to 477 farms in 2012 (National Agricultural Products Quality Management Service, 2014). If these systems of traceability provided necessary information of the differentiated selective attributes according to the processing stages, the trusts of consumers would also increase. Moreover, at the farm education in which ginseng farms participated, it should be taught that the consumers had different demands of information according to the processing stages and that the farms should manage the information accordingly.

This study compared the clusters of consumers of various types of processed products, and we held distinction in that we showed that there were differences between the consumer groups according to different processing levels. This study especially held distinction from the existing literature review for we had conducted comparative analysis among the consumer clusters. Also, this study implied that the ginseng product markets should be differentiated according to the product, and accordingly the marketing and promotion strategies should varied, obtaining practical distinction in the existing studies of the ginseng market.

Thus, this study was significant in deriving major selective attributes of fresh ginseng and red ginseng root consumers, and accordingly in the segmentation of the consumers respectively in comparison with the consumers of the fresh ginseng as a raw material and the red ginseng root as the processed type and in drawing the characteristics of each segmented cluster. This study, however, had its limits in segmenting the consumers solely based on surveys. In the future, the investigation results could be generalized by an actual expansion of the preferences survey of the segmented clusters of fresh ginseng and the red ginseng roots.

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