Identification of Niche Market for Hanwoo Beef: Understanding Korean Consumer Preference for Beef using Market Segment Analysis

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Abstract

Korean Hanwoo beef producers are interested in improving the image of Hanwoo beef for Korean consumers, as the Korean beef market is becoming increasingly open to international competition. This study examines the consumer profile and positioning for the Hanwoo beef product in South Korea. A survey of 480 consumers is conducted to analyze preferences for 33 attributes of beef purchasing decisions. Factor analysis was used to determine factors that are important in beef purchasing decisions, and cluster analysis was used to identify a niche market for branded Hanwoo beef. Factor analysis results indicated that effective labeling and quality assurance of Hanwoo products, the meat quality, price and branding are important to the positioning and marketing of the Hanwoo beef product. Consumers with medium to high income, married and aged between 30 to 39 years, and those that appreciate Hanwoo quality but do not trust the current labeling system are most likely to purchase branded Hanwoo beef and represent a potential niche market, according to cluster analysis results.

Keywords: beef branding, market segment analysis, Korean beef market

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Introduction

High production costs for domestic beef products, liberalization of beef importation in South Korea in 2001, and a wide array of food safety scares related to meat products in recent years have put Korean beef producers under substantial competitive pressure. Korean beef imports were subject to government regulations prior to 2001, but the Korean beef import quota was replaced by an *ad valorem* tariff of 41.6% in 2001.

Domestic beef production (Hanwoo) declined significantly throughout the period of import liberalization, as small-scale domestic producers were unable to supply beef at competitive prices, reflecting increasing prices for imported feeds and livestock. Some Korean cattle producers have responded to the market liberalization by phasing out of the beef industry (Choi et al, 2001). Consequently the market for relatively cheaper imported beef has increased at the expense of domestic production. For example, domestic production of beef declined from 205,000 tons in 1999 to 166,000 tons in 2001, while quantity of beef imports increased to 250,000 tons in 2001. Hanwoo beef had a premium of 33% compared to imported beef products in 2000 (KATI, 2002). The process of import substitution is expected to continue (USDA, 2001a,b).

Although beef is a highly preferred meat for Korean consumers, recent food safety scares in several countries (e.g. *e.coli,* BSE, *Foot and Mouth Disease*, dioxin, hormones and antibiotics) has led to a loss of consumer confidence in the safety of beef products in South Korea. Increasing concern of Korean consumers for the safety of beef products and considerable changes in Korean beef marketing system related to import liberalization have forced domestic beef producers to search for ways to improve their marketing.

Korean government agencies, beef producers and marketers currently focus on assuring safety and quality of domestic "Hanwoo" beef through several marketing activities. The marketing activities include revision of Hanwoo beef grading system, labeling of domestic and import origin of the product, promotion of geographic origin of production within Korea and implementation of traceability on Hanwoo supply chain. These marketing efforts are used to improve the image of Hanwoo beef in the eyes of the consumer and redefine Hanwoo beef as branded High Quality Beef (HQB) product.

The image attached to a well-managed brand is acknowledged as holding the powerful capacity to drive positive differentiating associations in the minds of potential customers, while simultaneously securing a source of valuable competitive advantage (Asker 1991). For retail Hanwoo beef, labeling is used on the package to specifically display the Hanwoo brand name. This allows the brand name and image to be further enhanced through marketing and promotional activities.

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In order to create a distinctive desirable image of Hanwoo beef, it is important to understand what factors contribute to Korean consumers' preference for beef products. This study uses factor analysis to determine factors that are important to Korean consumers' beef purchase decision of the Hanwoo beef. Factors identified from this analysis can be used to improve the image of Hanwoo beef. The study also uses cluster analysis to identify niche markets that may respond effectively to branding and marketing of Hanwoo beef. The study addresses the issue of how Hanwoo producers and marketers should differentiate their products and undertake strategies in order to obtain the highest premium for their products and to compete with lower cost imported beef.

Background

There is an escalating demand for beef products with high quality attributes, and these attributes include safety, marbling, freshness, and taste. This has created a growing market for value-added products that carry a strong identification with a particular country of origin or a strong brand image. The increasing importance of value-added marketing in meat markets is well documented in the literature (Li and Thilmany 1998; Chen et al. 2002; Kuperis *et al.* 1999; West and Larue 2001; Wachenheim *et al.* 2000; Peterson et al 2001; Grannis and Thilmany 2002; Bryhni et al. 2002; Umberger et al 2002; Roosen et al 2003; Verbeke and Viaene 1999; Kim et al. 1997; Kim 2003; Unterschutlz et al 1998a; Unterschultz et al. 1998 b; Hui et al. 1995).

Country of Origin and Branding Effects

Origin of the product (e.g. import versus domestic) seems to be an important attribute needed to differentiate and create new niche markets (Loureiro and Hine, 2002), as product origin is often considered to be a quality attribute that significantly affects consumers' purchasing decision. Product origin provides cues to consumers regarding quality, dependability, and value for money of the product, when more specific information is not readily available (Han and Terpstra, 1988; Hong and Wyer 1989).

Also, product origin can be considered to have a risk related property as consumers often perceive more risk in purchasing products from countries with a poor image or uncertainty and seek to enhance their status by purchasing products from countries with a positive image (Cordell 1993; Ahmed et al. 2002). Product origin is considered to be an extrinsic cue that is used in consumer's product evaluation. Consumers use extrinsic cues when intrinsic cues (e.g. taste and safety) are hard to evaluate; therefore product origin becomes an important quality signal to consumers in reducing uncertainty or risk.

Branding is also considered to be an important marketing strategy used by producers and marketers as it facilitates consumers to identify needs satisfied by the brand (Park et al, 1986). Branding of a product also enables producers to associate their products with higher source credibility, as consumers perceive the brand as producers' implied warranty (Ahmed et al 2002). Thus, branding allows sellers to capture the value of their particular product by differentiating it to the consumers and by signaling quality assurance.

Development of Hanwoo Branding and Labeling Initiatives in South Korea

Consumers face difficulty judging the quality and safety attributes (intrinsic cues) of meat products (Caswell & Padberg, 1992) and must rely on external sources, either private or government, for information regarding the safety and quality of meat products (Roosen et al. 2003). In the case of South Korea, the Korean government and domestic beef industry together introduced marketing and labeling initiatives to increase Hanwoo's competitiveness since 1995.

These marketing initiatives focused on improving the marketing system of domestic beef and on improving the Hanwoo-only breeding farms (USDA 1996). Some of these initiatives included introduction of a new grade for "high quality beef (HQB) Hanwoo", developing a labeling system for domestic beef specifying cuts and species (Hanwoo or dairy); and initiating a grading system at the retail level beginning in 1997 (USDA 1996). To be labelled HQB Hanwoo, a steer or a heifer must reach a specified sufficient weight. The idea is to keep these cattle on feed longer in order to provide a well-marbled product with improved taste (USDA 1996). Introduction of the HQB Hanwoo is intended to facilitate branding of Hanwoo beef as a premium quality product.

Survey Design and Data Collection

The survey questionnaire was divided into four sections. The first section comprised questions on general beef consumption patterns and beef attributes that are important in purchasing decision-making. In the second section, respondents were asked to rate on a five- point Likert scale regarding price, quality difference between imported and domestic beef (end-usage, food safety and meat quality). The third section comprised questions on brand and labeling and the fourth section included questions on socio-economic factors. The survey questionnaire was designed in consultation with meat retailers and pre-tested with meat shoppers and industry representatives.

The data for this study were collected by administering a survey questionnaire to consumers who purchase beef in South Korea during the winter of 2000. The study is based on a convenience sample of beef shoppers at the National Agricultural Coop Federation (NACF) stores. Consumers were randomly solicited in the meat section

of the NACF stores and asked for voluntary participation in the survey. The nature of this sampling will preclude a broad generalization of the findings (Blair, 1983), however, it fits the exploratory objective of this study and may provide an indication of the suitability of this methodological approach for further studies in future. Of 600 surveys attempted, 460 were completed and returned, yielding a response rate of 76.6 %.

Methods and Procedures

Our analysis involved a two step-method in sequence. First, factor analysis was used to explore underlying factors that are important for beef purchase decision-making. Factors identified from this analysis can be used to improve the image of Hanwoo. The second step involved cluster analysis to identify groups of consumers that are most likely to purchase Hanwoo beef and respond to branded Hanwoo promotion. Profiles (i.e. specific demographic and beef purchasing preference) of market segments are identified from this analysis in order to determine target consumer groups for the branded Hanwoo and marketing strategies.

Factor Analysis

Factor analysis is a multivariate statistical procedure for grouping similar variables into subset when they are highly correlated (Johnson 1998, p.148). For example, if variable A, B and C were highly correlated, they may be represented by a factor. If variable D, E and F are highly correlated and different from the variables in the first factor, they could be represented by another factor. Thus, factor analysis is typically used to summarize the variation among many variables in terms of a few underlying but unobservable random variables called factors (Jobson 1992, p.388).

The survey questionnaire in this study included 33 observable variables (survey questions) that were considered to be important in beef purchasing decisions, and factor analysis allowed us to reduce these 33 variables to more manageable smaller set of factors.

The factor analysis model that is developed in this study can be specified as:

$$x = \lambda F + \varepsilon$$

where x is a p variate response vector ($p \times 1$) of the 33 observed variables, λ is an ($p \times$ m) matrix of factor coefficients with m< p condition, F is a vector (m$\times 1$) of unobserved factors for $k =1,2,\ldots, m$; and ε is an error vector ($p \times 1$) that is independently distributed of F for $j =1,2,\ldots, p$.

The multiplier, λ_{jk}'s are called factor loadings which are correlations between the factors (F) and standardized original variables (x). The factor loading λ_{jk} is interpreted as the loading of the jth response variable on the kth factor. The factor loading process generates a new set of latent factors (F_{jk}) and assigns a score for each of the factors. The factor scores are the correlation coefficients between the observable variables and the identified factors.

Market Segment Analysis

The market segment analysis used here seeks to identify consumers that are most likely to respond to Hanwoo branding promotion. In many cases, different consumer groups respond differently to the attribute combinations. It is of great importance for the purpose of generating marketing strategies to identify market segments and to interpret them in terms of demographic or other external information (e.g. preference for beef products) (Naes et al 2001).

Cluster analysis is typically used to develop market segmentation models (Larson 1997; Baker and Burnham 2001; Gil et al 2000; Baker 1999; Farrell 2000; Baker and Crosbie 1993; Walley et al 1999; Naes et al 2001). Cluster analysis combines the units (respondents' answers in the survey) in a data set into groups of relatively homogenous units called 'cluster' (Jobson 1992, p.481). Identified clusters are considered as market segments which may exist within the overall market for the branded Hanwoo beef, and the clusters are interpreted in terms of variation in demographic characteristics or consumer attitudes to certain issues (e.g. labeling).

The market segment information can enable marketers to examine the purchasing behaviors and preferences of the consumers in each of the distinct subgroups. In other words, this information allows for more efficient use of resources by marketers and provides guidelines of how to best identify and target consumers of specific market segments (Johnson 1998). Basing policy and marketing decisions on the preferences of consumer segments should lead to policies which better meet consumer needs, compared to policy or marketing choices based on average consumer preferences (Baker and Crosbies 1993).

In this study the straightforward clustering of the rows of consumers by variables data matrix has been applied. In other words, Korean consumers (460 respondents) were segmented based on demographics (7 variables) and preferences for beef purchasing condition (33 observed variables) in the cluster analysis. This straightforward clustering method is reported to have a superior performance compared to alternative clustering techniques such as tandem method which combine factor analysis with cluster analysis (Schaffer and Green 1998; Green and Krieger1995; Larson 1997).

The K-means clustering was used to assign observations into the nearest cluster, using an Euclidean distance measure. Thus, an observation x_i $(i = 1, 2, \ldots, n)$ is assigned to cluster C_s $(s = 1, 2, \ldots, K)$ if:

$$(x_i - c_s)'(x_i - c_s) = \min(x_i - c_j)'(x_i - c_j) \quad \forall j = 1, 2, \ldots, K$$

where $C_1, C_2, \ldots, C_k$ are the initial set of clusters; c_s and c_j are the means of clusters C_s and C_j, respectively; K is the number of clusters desired; and n is the number of observations (Katsars *et al.* 2001).

Results

Factor Analysis Model Results

Table 1 reports the rotated factor matrix for $N = 460$ sample with 33 observable variables. The principal components method and varimax rotation were used with SPSS 11.0 to generate latent factors. Guttman's *eigenvalue 1 criterion* (eigenvalues >1) and scree plot were used to determine the number of factors. Table 1 presents rotated factor matrix, including observed variables that are correlated (absolute correlations that are greater than 0.40) with the six rotated factors. The six factors explained 44 percent of the total variance in the sample data.

The original rating data for 33 observable variables (survey questions) were regrouped according to the six factors generated and used to calculate a comparative average rank for each factor (Figure 1). Overall, all six latent factors
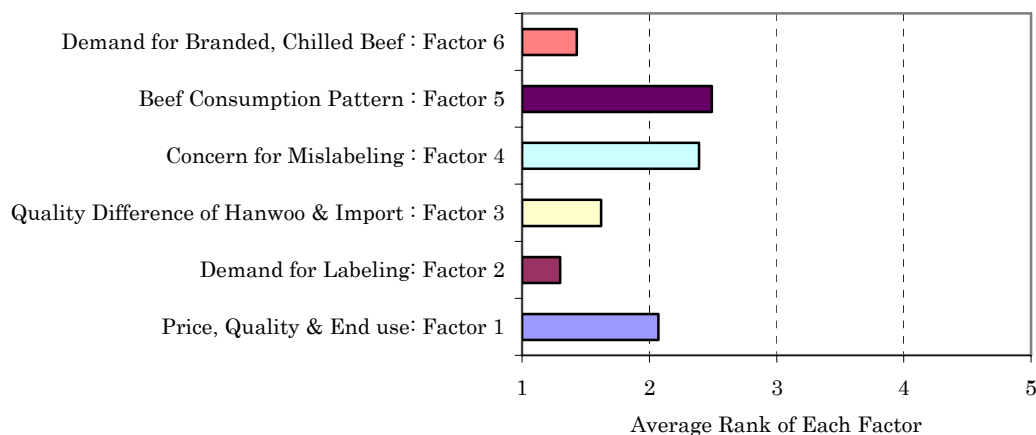

Figure 1: Comparison of Average Rank of the Six Factors*
*1=very important; 5=not important at all

were rated to be very important on the Likert scale (1=very important and 5 =not important). The average ranks of six factors indicated that sufficient labeling of beef products was indicated as the most important factor affecting consumers' beef purchasing decision.

Branding and value adding to beef products (e.g. chilled beef) was also found to be an important factor in Korean consumers' decision making of beef purchase. The quality difference between Hanwoo and imported beef, mislabeling of beef products, trade offs between price and quality are other factors affecting Korean consumers' purchasing decision.

The labeling factor comprises the importance of labeling for imported and Hanwoo beef, type of cut, grade and end use. The branding and value adding factor corresponds with demand for chilled imported beef, demand for branded Hanwoo beef and knowledge of branded Hanwoo beef. The imported vs. Hanwoo quality difference factor includes the importance of taste, safety, freshness and marbling of beef (Table 1).

Market Segmentation Model Results

The factor analysis model above reduced the original data set (33 survey questions) to six important factors, which can be used to improve the image of the Hanwoo beef. The second stage of this study segments consumers into homogenous subgroups using cluster analysis.

Five types of consumer profiles or segments were identified using K-means partitioning technique of cluster analysis, with SPSS 11.0 according to a maximum likelihood approach. These five clusters were partitioned based on 33 observable variables and 7 demographic variables obtained from the survey.

The five clusters are identified as follows. Segment 1 is the Safety Hanwoo Buyers (buy Hanwoo for safety); Segment 2 is the Price Import Buyers (buy import for price); Segment 3 is the Quality Import Buyers (buy import for quality); Segment 4 is the Quality Hanwoo Buyers (buy Hanwoo for quality); and Segment 5 is the Middle of the Road Shoppers (Table 2). The Middle of the Road Shoppers is a consumer segment that did not seem to have a clear preference between Hanwoo and imported beef.

The Safety Hanwoo Buyers represent the largest consumer group with 34% of the respondents, followed by the Middle of the Road Shoppers, who make up 21%. Other three segments are the Price Import Buyers (17%), Quality Hanwoo Buyers (14%) and Quality Import Buyers (14%). Some characteristics of the five segments regarding income, age and family structure are shown in part b) of Table 2.

Table 1: Factor Scores: Correlations between Observed Variables and Identified Factors*

Observed Attributes (Survey Questions)	Factor 1 Price, Quality& End Usage	Factor 2 Labeling	Factor 3 Quality difference between Hanwoo & Imported beef	Factor 4 Concern for mislabeling	Factor 5 Beef Consumption Pattern	Factor 6 Demand for Branded and Chilled Beef
Prefer Hanwoo	0.82					
Use Hanwoo for BBQ	0.75					
Use Hanwoo for Grilled dish	0.68					
Use Hanwoo for Soup	0.65					
Buy Imported Beef for Cheaper Price	0.47					
Labeling for Imported Beef		0.79				
Labeling for Type of Cut		0.76				
Labeling for Hanwoo		0.76				
Labeling for End use		0.74				
Labeling for Grade		0.55				
Taste			0.79			
Safety			0.76			
Freshness			0.67			
Marbling			0.64			
Mislabeling of Hanwoo				0.86		
Mislabeling of Imported Beef				0.83		
Lack of Labeling				0.69		
Frequency of Eat away from Home					0.72	
Trust in the quality of Restaurant Beef					0.60	
Home vs. Home away Beef consumption					0.57	
Know Branded Hanwoo						0.56
Demand for Chilled Imported Beef						0.54

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
* Factor scores > 0.40 are reported here, which include 22 of the 33 observable variables.

Table 2: Profiles of Five Market Segments

Segment 1 The Safety Hanwoo Buyers	Segment 2 The Price Import Buyers	Segment 3 The Quality Import Buyers	Segment 4 The Quality Hanwoo Buyers	Segment 5 The Middle of the Road Shoppers

a) Some Characteristics of Preferences for the Five Market Segments

Pay higher for safety	Buy import for cheaper price	Import has better marbling and comparable quality to Hanwoo	Pay higher for quality	Hanwoo has better quality
Use Hanwoo only for beef dishes	Use import for beef dishes	Use import for beef dishes: BBQ, grill	Use Hanwoo only for beef dishes	Use both Hanwoo & Import for beef dishes
Hanwoo has better quality	Hanwoo has better quality		Hanwoo has better quality	
Distrust labeling of Hanwoo & Import			Trust labeling of Hanwoo, Import	
Highest demand for branded Hanwoo			High level of knowledge of Hanwoo production	

b) Some Characteristics of Demographics for the Five Segments

U$2000-3000 monthly earning	US$1000-2000 monthly earning	US$1000-2000 monthly earning	US$2000-3000 monthly earning	US$2000-3000 monthly earning
30 to 39 years	40 to 55 years	30 to 39 years	30 to 39 years	30 to 39 years & 40 to 55 years

Table 3: Cluster Demographic Characteristics (%)

	Segment 1 The Safety Hanwoo Buyers	Segment 2 The Price Import Buyers	Segment 3 The Quality Import Buyers	Segment 4 The Quality Hanwoo Buyers	Segment 5 The Middle of the Road Shoppers
Month Income					
Below US$1000	0.66	10.39	9.38	1.61	6.45
US$1000-2000	17.11	36.36	31.25	19.35	26.88
US$2000-3000	42.11	31.17	26.56	37.10	49.46

US$3000-5000	31.58	18.18	28.13	24.19	16.13
US$5000-10000	8.55	2.60	4.69	9.68	1.08
Over US$10000		1.30		8.06	
Decision Maker for Beef Purchase*					
Parent	6.54	3.85	12.70	6.06	4.35
Spouse	48.37	43.59	41.27	42.42	44.57
Children	37.25	35.90	36.51	42.42	40.22
Myself	5.23	7.69	7.94	4.55	8.70
Others	2.61	8.97	1.59	4.55	2.17
Family Structure					
Married Couple with no Child	5.23	10.26	9.38		6.45
Married Couple with Children	77.78	71.79	78.13	63.64	86.02
Married Couple with Parents	2.61		4.69	12.12	2.15
Married Couple with Parents & Children	14.38	17.95	7.81	24.24	5.38
Age of Children					
Under 6 years	0.67		3.28	1.56	2.25
7 to 12 years	12.75	6.58	27.87	14.06	23.60
13 to 17 years	70.47	68.42	59.02	70.31	67.42
18 to 21 years	14.09	25.00	9.84	12.50	6.74
Over 21 years	2.01				
Family Size					
Single	0.67		3.13		
Two people	2.67	3.85	7.81		7.69
Three people	13.33	8.97	25.00	9.09	23.08
Four people	58.67	51.28	53.13	56.06	59.34
Five people	18.67	29.49	9.38	15.15	9.89
Over	6.00	6.41	1.56	19.7	
Employment Status					
Employed	51.30	55.13	48.44	45.45	40.86
Unemployed	46.75	43.59	48.44	54.55	55.91
Age					
Under 29 years	4.55		9.38	7.58	8.60
30 to 39 years	51.95	41.56	60.94	62.12	46.24
40 to 55 years	36.36	53.25	23.44	24.24	41.94
Over 56 years	7.14	5.19	6.25	6.06	3.23

* Indicates that significant differences exist among segments at the 5% probability level.

Cluster Demographics Results

In this study, seven socioeconomic variables were used to generate demographic characteristics for five consumer segments (Table 3). Income and age are the main key demographic variables explaining segmental distinctions, while other demographic variables were found to be consistent across segments. This was not surprising given that the survey data was collected through a convenience sampling of beef shoppers at the National Agricultural Coop Federation (NACF) stores. The majority of respondents are the primary shoppers of the household who are married and have children under the age of 18 years old.

The Safety Hanwoo Buyers and the Quality Hanwoo Buyers had higher level of monthly income compared to consumers in other market segments; 42.1% of the Safety Hanwoo Buyers and 37.1% of the Quality Hanwoo Buyers had monthly income of US$2000-3000. Thirty six percent of the Price Import Buyers and 31.5% of the Quality Import Buyers had monthly income of US$1000-2000, respectively. This result indicates that income level is an important socioeconomic factor that affects Korean consumers' choice of beef.
The Quality Import Buyers and the Quality Hanwoo Buyers were found to be younger than the Safety Hanwoo Buyers, the Price Import Buyers and the Middle of the Road Shoppers. Approximately, the majority (over 70%) of the Quality Import Buyers and of the Quality Hanwoo Buyers were under 39 years. These were the consumers who had positive images on either quality of imported beef (the Quality Import Buyers) or on labeling of Hanwoo beef (the Quality Hanwoo Buyers).

Marketing Implications

The data provided by 460 beef shoppers in South Korea provided some insights to a better understanding of consumers' preferences for beef products. Two issues were explored that can affect future direction of Hanwoo branding program in South Korea. The first was to gauge factors that are considered to be important in Korean consumers' beef purchase decision-making with factor analysis. This finding enabled us to recognize the aspects of beef attributes that need to be emphasized or elaborated in order to improve the image of Hanwoo beef. The second issue was to determine market segments that could effectively respond to Hanwoo branding promotion. Cluster analysis was used to categorize consumers into homogeneous subgroups.

Results suggest a number of recommendations to Hanwoo producers and policy makers of the Korean beef marketing system. Overall, results of factor analysis indicate labeling and branding of Hanwoo were found to be the most important factors affecting Korean consumers' beef purchase choice. Other factors such as meat quality (i.e. marbling and freshness), concerns for safety (i.e. mislabeling), end usage and price were also determined as important categories of beef attributes for

Korean consumers' beef purchase decision. Thus, policy makers and Hanwoo marketers should enhance these aspects of beef attributes in developing policy and marketing strategies of Hanwoo beef.

Findings of cluster analysis provide detailed information on subgroups of Korean consumers, which can be used to determine current status of Korean beef consumers' preference for imported beef vs. branded Hanwoo beef. First, half of the sample respondents chose either Hanwoo or imported beef for specific positive factors (i.e. price or quality); these were the Price Import Buyers, the Quality Import Buyers and the Quality Hanwoo Buyers (Table 2). The other half of the sample respondents included consumers who purchased Hanwoo due to safety concern or quality assurance (the Safety Hanwoo Buyers) and consumers who were indeterminant (the Middle of the Road Shoppers).

Niche Marketing Strategies

Special attention has to be paid to the Safety Hanwoo Buyers, the Quality Import Buyers and the Middle of the Road Shoppers. They represent a potential for market growth for Hanwoo beef, and specific- marketing strategies should be addressed to them.

An important task for Hanwoo marketers is to increase consumers' knowledge of how Hanwoo's quality is different from imported beef since knowledge level of the quality of Hanwoo was found to be relatively low among consumers (Table 4). Hanwoo producers and marketers would need to clearly communicate distinct and observable benefits of Hanwoo to consumers- such as high level of marbling in High Quality Beef (HQB) Hanwoo products. Marbling was found to be the most critical physical attribute of beef purchasing decision for Korean consumers (Kim 2003).

This marketing strategy should be targeted to the Middle of the Road Shoppers who are indecisive on beef choice and the Quality Import Buyers who perceive Hanwoo and imported beef as comparable substitutes.

Hanwoo producers and marketers might also organize generic promotion activities periodically with public institutions to increase awareness of branded Hanwoo beef. This marketing strategy should be effectively communicated to the Safety Hanwoo Buyers who had the highest demand for branded Hanwoo and for quality assurance (Table 2 & 4). The Safety Hanwoo Buyers also had a high level of distrust in labeling system of beef products and may perceive branding of Hanwoo beef as an extension of quality assurance and safety measure.

Hanwoo producers could sell HQB Hanwoo directly to specialty stores (e.g. HQB Hanwoo-only retail outlets) as an alternative to address consumer concern for

Table 4: Comparison of Five Market Segments Regarding Six Major Beef Attributes

	Segment 1 The Safety Hanwoo Buyers	Segment 2 The Price Import Buyers	Segment 3 The Quality Import Buyers	Segment 4 The Quality Hanwoo Buyers	Segment 5 The Middle of the Road Shoppers
Factor 1 : Preferences for Price, Quality, Hanwoo & End-use /1					
Use Hanwoo for grill	1.30	2.70	3.19	1.30	2.09
Use Hanwoo for BBQ	1.28	2.90	2.98	1.14	2.55
Use Hanwoo for Soup	1.15	1.88	1.88	1.02	1.68
Prefer Hanwoo	1.22	2.37	2.30	1.18	1.88
Buy Import for good price	3.77	2.00	2.49	4.05	3.06
Pay higher for better quality	1.86	2.68	2.46	1.71	2.25
Factor 2 : Demand for Labeling /2					
Labeling of Grade	1.24	1.36	1.40	1.18	1.50
Labeling of End-use	1.37	1.57	1.63	1.26	1.65
Labeling of Hanwoo	1.11	1.25	1.38	1.11	1.36
Labeling of Type of cuts	1.27	1.37	1.53	1.28	1.39
Labeling of Import	1.05	1.09	1.21	1.06	1.22
Factor 3 : Quality Difference of Hanwoo vs. Import /3					
Marbling	1.84	2.17	2.84	1.54	1.88
Freshness	1.41	1.62	2.32	1.20	1.28
Safety	1.52	1.61	2.17	1.33	1.51
Taste	1.27	1.28	2.15	1.23	1.38
Factor 4 and 5 : Concern for Mislabeling & Beef Consumption Pattern /4					
Trust restaurant beef quality	3.59	3.78	3.50	3.40	3.52
Freq. of eat away from home	2.24	2.34	2.50	2.22	2.38
Eat beef more at restaurant	1.91	2.13	1.95	1.92	2.07
Need more labeling info	2.18	1.99	2.29	3.55	2.69
Mislabeling of Hanwoo	1.90	1.64	2.23	3.55	2.69
Mislabeling of Import	1.94	1.62	2.27	3.98	2.89
Factor 6 : Demand for Branding and Chilled Beef /5					
Knowledge of Hanwoo quality	2.33	2.34	2.55	2.00	2.17
Want branded Hanwoo	2.01	2.55	2.68	2.13	2.29
Want chilled Import	2.72	2.64	2.45	2.76	2.30
Know branded Hanwoo	3.45	3.61	3.89	3.15	3.16

/1: 1=strongly agree, 5=strongly disagree; /2: 1=very important, 5=not important at all; /3: 1=Hanwoo, 2=neutral between Hanwoo and Import, 3=Import; /4: 1=strongly agree, 5=strongly disagree; /5: 1=strongly agree, 5=strongly disagree;

quality assurance of Hanwoo. These specialty stores should be located in residential area where residents' socio-economic characteristics match with targeted consumer profile-consumers who have relatively high income (US$2000 to 5000), have children and who are younger (30 to 39 years old) and married (Table 3).

Conclusions

The empirical results from the factor analysis and cluster analysis suggest that Korean consumers prefer specific labeling on beef products, as they are concerned with quality and safety of beef (Figure 1 & Table 4). Policy makers and Hanwoo marketers would need to emphasize reliability of the marketing system of Hanwoo beef regarding safety and quality assurance. The regulatory processes and polices designed and introduced by the Korean government in 2001 regarding labeling of Hanwoo and imported beef may increase consumer confidence in the quality and safety of Hanwoo products. The findings also suggest that Korean consumer demand for beef is segmented by key beef attributes and by socioeconomic factors (i.e. income and age), which implies the importance of niche marketing on identifiable sub-groups of Korean consumers.

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