

# Evaluating Choice Attributes of Korean Ginseng Chicken Soup as a Home Meal Replacement (HMR) Product Using Conjoint Analysis: A Case Study of Singapore Market

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## Abstract

**Purpose:** The purpose of this study was to analyze the attributes considered important by Singaporeans in the selection of Korean ginseng chicken soup as an HMR product using conjoint analysis techniques. **Methods:** A total of 400 questionnaires were distributed to local consumers in April 2012, of which 324 were completed (81.0%). Statistical analyses of data were performed using SPSS/Windows 18.0 for descriptive statistics and conjoint analysis. **Results:** Analysis of the attributes and levels of Korean ginseng chicken soup as an HMR product for people who lived in Singapore showed the relative importance of each attribute as follows: packing (32.4%), chicken (32.1%), glutinous rice (13.8%), soup (11.6%), and ginseng (10.0%). Results showed that Singaporean consumers preferred code J's Korean ginseng chicken soups as an HMR product, which consisted of half a chicken, glutinous rice, a whole ginseng root in a soy sauce-based soup, and a partially transparent package. The most preferred Korean ginseng chicken soup gained 50.4% potential market share from choice simulation when compared with the second preferred one. **Conclusion:** This study has significance in that such a practical research contributes to product development of a specific Korean dish for foreign consumers. In addition, the results of this study provide useful information for the food industry for global expansion and commercialization of Korean food, thereby providing an important foundation for future development of various Korean foods as HMR products.

**Key words:** HMR (Home Meal Replacement), Korean food, Korean ginseng chicken soup, conjoint analysis

## 컨조인트 분석을 이용한 삼계탕 간편가정식의 선택속성 분석: 싱가포르 시장을 중심으로

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## 초 록

**목적:** 세계 식품시장에서 한식과 편이식에 대한 니즈가 점차 증가함에 따라 싱가포르 시장은 한식을 이용한 간편가정식(HMR)의 잠재시장으로 떠오르고 있다. 다양한 한식 메뉴 중에서도 특히 삼계탕은 싱가포르 소비자의 선호도가 매우 높아 본 연구에서는 컨조인트 분석을 적용하여 삼계탕 HMR 선택 속성의 중요도를 분석하고자 하였다. **연구방법:** 2012년 4월 싱가포르 현지 소비자 400명을 대상으로 설문지를 배포하였으며, 이 중 설문을 완료한 324명(81.0%)의 데이터를 분석하였다. **결과:** 삼계탕 HMR을 구매하는데 있어 상대적으로 가장 중요한 속성으로는 포장(32.4%)이었고, 닭의 형태(32.1%), 찹쌀 포함 여부(13.8%), 삼계탕의 품미(11.6%)와 인삼(10.0%)의 순서로 조사되었다. 제시된 16개 프로파일 중 제품 코드 J의 닭 반마리, 찹쌀 포함, 인삼 전체 한 뿌리 포함된 형태, 간장 육수, 그리고 제품이 부분적으로 보이도록 투명한 포장형태로 구성된 제품의 선호도가 가장 높은 것으로 조사되었다. 또한 초이스 시뮬레이션 분석을 통해, 싱가포르 소비자가 가장 선호하는 삼계탕 HMR이 출시될 경우 예상되는 시장 점유율은 50.4%로 나타났다. **결론:** 이러한 조사 결과는 외국인 소비자의 보다 세분화된 니즈를 반영한 한식 상품을 개발하는데 구체적인 자료를 제공하며, 식품 산업적으로도 소비자 기호를 반영한 상품을 출시 할 수 있을 것으로 판단된다. 더불어 향후 한식 간편가정식 개발이 더욱 활성화 됨에 따라, 한식 세계화에 따른 한식의 소비 확대에 보다 실제적인 적용이 가능할 것으로 사료된다.

**주제어:** 한식, 삼계탕, 간편가정식, 컨조인트 분석

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## I . Introduction

In recent years, the market for ethnic food has noticeably grown, with international flavors becoming the most significant trend responding to consumers' increasingly diverse palates (National Restaurant Association 2012). Among the several choices for ethnic food, Asian food is a remarkably growing cuisine type in the world. In particular, Korean food has been gaining popularity with the perception of it being healthy (Korea IT Times 2010). As an increasing number of people are pursuing a healthy lifestyle, the world food market includes inclinations toward health and wellness (Food Product Design 2011, Food Processing 2012). Under these circumstances, Korean cuisine meets global consumers' demands not only to satisfy a variety of preferences for ethnic food but also simultaneously to satisfy the desire for healthy choices.

Korean ginseng chicken soup is a traditional Korean dish eaten during summer to provide nutrition and moderate the effects of heat (Korean Food Foundation 2012a). It consists of a whole young chicken stuffed with glutinous rice, ginseng, jujubes, and garlic, which is then boiled in a large soup pot with water and milk vetch root. In Korea, tradition equates fine food with medicine, and chicken, one of the primary ingredients of Korean ginseng chicken soup, is rich in protein and essential amino acids (Suzuki H & Rhim JH 2000). Extensive research has shown that Korean ginseng chicken soup ranked highly among the Korean dishes preferred by foreign consumers, especially in Asian countries (Lee AJ et al. 2009, Seo SH & Ryu KM 2009, Lee JY et al. 2010, Korean Food Foundation 2012b). According to the study by Chang HJ et al. (2010) that examined preferred Korean dishes and opinions on developing Korean foods for commercialization, Korean ginseng chicken soup ranked among the top five choices of foreign consumers and fourth (8.9%) among the dishes for high marketability as a convenience food.

In the convenience food market, home meal replacement (HMR) is a superordinate concept, which refers to food fully or semi-prepared commercially and consumed at home with little or no preparation (Chung LN et al. 2007). As food technology advances, convenience foods have flavors and nutrients similar to meals prepared originally and freshly at home (Kwon TS et al. 2005, Choi WS et al. 2012). The importance of the convenience food industry is growing along with consumers' demands for dynamic changes in lifestyles and socioeconomic conditions

(Geeroms N et al. 2008). These changes associate with increased working hours, dissolution of traditional diet patterns, and greater affordability of food due to higher incomes (Gofton L 1995, Hutchins R & Dawson A 1998, Scholderer J & Grunert KG 2005, Costa AIDA et al. 2007). Demand for convenience and efficiency causes families to prepare meals less frequently at home and more frequently consume fully or semi-processed, purchased, or delivered food, consumed at home (Kwon TS et al. 2005, Kim KJ & Park KY 2007). These trends are the driving forces for the development of HMR in the food industry.

Singapore, in particular, has significant opportunities to market Korean ginseng chicken soup as an HMR product. Among Southeast Asian countries, Singapore has the highest food consumption that accounts for about \$7.5 billion—3% of the country's GDP (Business Monitor International 2015). In addition, Singapore is an international city where various ethnicities mingle. For Singaporean consumers, ethnic food is not exclusively for special occasions but rather has the perception of being part of everyday diet. The percentage of people in Singapore with experience in eating ethnic food is 98.4% (Korean Food Foundation 2012b). Since 2005, Korean culture has gained popularity that has increased the interest and familiarity with Korean food in Singapore. Moreover, Korean food received the highest evaluation when locals expressed satisfaction with the taste of different ethnic foods (Korean Food Foundation 2012b). The degree of satisfaction with Korean ginseng chicken soup placed it second among 21 different Korean dishes and among the three leading Korean dishes with which locals had the most experience and the greatest satisfaction (Korean Food Foundation 2012b). According to the market demand, Korean ginseng chicken soup is a product with great potential in Singapore's HMR market because Singapore's locals believe Korean food is nutritional, simple, and adequate.

The Singapore Department of Statistics reported that the country has a significant percentage of female employment, 73.7%, an above average percentage for Asia (Korean Food Foundation 2012b). As fewer people cook at home, the demand for prepared foods is rising rapidly and purchases of ready meals are also increasing due to convenience and affordability (New Zealand Trade and Enterprise 2016). Additionally, with higher disposable incomes, more consumers seek highquality, premium foods that are also healthy (Euromonitor International 2011). All of these reasons suggest a high potential for Korean ginseng chicken soup

as an HMR product succeeding in the Singapore market.

As the market gradually becomes more consumer centered, the importance of standards on which consumers base their purchases has increased (Grunert KG et al. 1995). Along with increased competition in the market, consumer-based orientation toward the market gains significance as consumers consider aspects of value and quality (Bogue J et al. 2006). Dimancescu D & Dwenger K (1996) emphasize that recognizing consumers' needs for product development are important. Orientation toward the consumer guides developers of new products to reevaluate concepts for products, thereby increasing competitiveness of the company in the market and heightening the possibility of success when launching a new product (Bogue J et al. 2006).

In conjoint analysis, respondents indicate preferences for specific alternatives among products, which consist of a combination of several attributes and each attribute's levels (Green PE & Srinivasan V 1978). The result from conjoint analysis assists developers in determining the most valuable and effective profile from all potential combinations of attributes for the product or service (Toombs K & Bailey G 1995). Hair JF et al. (1998) evaluated conjoint analysis as a technique that can provide in-depth understanding of the composition of consumers' preferences while maintaining practicality. Attributes are the important characteristics of the product, functioning as independent variables that influence consumers' decisions (Ahn SS et al. 2005). When consumers select a product, they experience a decision-making process based on trade-offs, forgoing certain attributes for other attributes (Gil JM & Sánchez M 1997). Therefore, the optimized products through conjoint analysis are similar to actual market share achieved (Chakraborty G et al. 2002).

A few recent studies attempted to research HMR; however, the majority of published studies focused on consumers' recognition, preferences, repurchase intentions, and satisfaction (Geeroms N et al. 2008, Bae JH et al. 2010, Olsen NV et al. 2010, Jang YJ et al. 2011, Na JK & Kim KA 2012, Yoo YH et al. 2012). Little research considered the development of HMR products by Choi WS et al. (2012), Jeon HM & Lee SB (2009) focused on development about Korean HMR products of the Koreans. Thus, to the best available knowledge, no study has considered the development of a specific Korean cuisine as an HMR product for foreign consumers.

The aim of this study was to identify consumers' pref-

erence attributes and develop an optimized concept for an HMR product of Korean ginseng chicken soup in the Singapore market through the choice conjoint analysis. In addition, this study derived estimated market shares from optimized concept for Korean ginseng chicken soup as an HMR product in the Singapore market.

## II . Methods

### 1. Questionnaire and measurement

Three panel discussions were conducted among 10 experts before a consumer survey, because panel discussion has been identified as a source of setting attributes and levels for application to the conjoint analysis (Green PE et al. 2001). The panel discussions should result in agreement for five attributes and their corresponding 12 attribute levels of Korean ginseng chicken soup as an HMR product: package form (transparent, partially transparent, opaque), form of chicken (a whole chicken, half a chicken, chicken pieces), form of ginseng (mixed in its original form, mixed after grinding), inclusion of glutinous rice (included, not included), and soup flavor (salted, seasoned with soy sauce).

Then, varied virtual profiles composed of the attribute levels along with relevant studies provided the basis for development of a self-administered questionnaire for a consumer survey. The questionnaire consisted of three parts. The first part requested respondents to provide demographic information, including gender, age, ethnicity, occupation, monthly income, family types, weekly expenditures for dining out, and responsibility for cooking at home. In addition, open-ended questions elicited data for family members' frequency of dining out per week, past experience visiting Korea, and frequency of eating Korean food per month. The second part of the questionnaire, using multiple-choice questions, sought consumption patterns of HMR products, including frequency of purchases, factors for consideration for those purchases, purchasing places, and types of products. The third part requested ranking 16 virtual profiles according to preferences in order to identify the optimal concept for Korean ginseng chicken soup as an HMR product.

Conjoint analysis primarily measured the relative importance of five attributes and the utilities of 12 attribute levels. In conjoint analysis, preparing the attributes and their corresponding attribute levels should lead to a method for designing a product's virtual profiles. In general, research opts for either a full-profile or a trade-off

approach. Given that this study adopted a more realistic full-profile method, which considers simultaneously a number of attributes ranked according to consumers' preferences and simplifies consumers' responses (Green PE & Srinivasan V 1990), combining the different 12 attribute levels derives 72 ( $3 \times 3 \times 2 \times 2 \times 2$ ) profiles. On the assumption that having too many profiles hinders the judgment of respondents, an orthogonal design in the PASW Statistics Package shortlisted 16 virtual profiles for Korean ginseng chicken soup as an HMR product. This is a factorial design method that reduces the number of profiles while minimizing data loss, producing the minimum number of profiles necessary to measure only the major effects (Lusk JL & Norwood FB 2005).

## 2. Data collection

A consumer survey randomly sampled 400 local consumers who attended the Singapore Food Expo during April 17-19, 2012. Respondents were able to choose among English, Chinese, and Malaysian versions of the survey. Researchers and assistants from the local community assisted the respondents in completing the questionnaire properly. The final analysis included 324 collected questionnaires (return rate of 81.0%).

## 3. Statistics Analysis

All analyses were conducted using SPSS Statistics (ver. 18.0, SPSS Inc., Chicago, IL, USA). Demographic information and consumption patterns of HMR products for the respondents were analyzed by descriptive statistics. Moreover, preference of hypothetical profiles for Korean ginseng chicken soup as an HMR product was calculated with relative importance weights of each attribute through a conjoint analysis. In addition, choice simulation was conducted to estimate the market share when launching an optimized HMR product for Korean ginseng chicken soup.

# III. Results and Discussion

## 1. Demographic profiles of respondents

Table 1 shows the demographic profiles of the respondents, including 212 women (65.4%) and 112 men (34.6%). As for the age groups, respondents in their 20s accounted for the largest group, 34.6%, followed by those in their 30s (25.3%), 40s (19.8%), and 50s, and higher (14.8%). More than half (74.7%) of the respondents were

Chinese, followed by Malaysians (9.6%), and Indians (1.9%). Regarding family type, households containing two generations were most common (39.5%), followed by

**Table 1.** Demographic profiles of respondents

Items		Frequency (n)	Percentage (%)
Gender	Male	112	34.6
	Female	212	65.4
Age (yr)	Under 19	17	5.2
	20-29	112	34.6
	30-39	82	25.3
	40-49	64	19.8
	Over 50	48	14.8
	No response	1	0.3
Ethnicity	Chinese	242	74.7
	Malaysian	31	9.6
	Indian	6	1.9
	Others	42	13.0
	No response	3	0.9
Occupation	Student	35	10.8
	Independent business	50	15.4
	Company employee	135	41.7
	Professionals	44	13.6
	Others	59	18.1
	No response	1	0.3
Monthly income (SGD)	Less than 1,000	54	16.7
	1,000-1,999	62	19.1
	2,000-2,999	82	25.3
	3,000-3,999	59	18.2
	More than 3,999	57	17.6
	No response	10	3.1
Family types	One-person household	100	30.9
	Married-couple household	23	7.1
	Two-generation household	128	39.5
	Three-generation household	70	21.6
Weekly expenditure for dining out (SGD)	Less than 50	62	19.1
	50-99	111	34.3
	100-199	85	26.2
	200-299	31	9.6
	More than 299	29	9.0
	No response	6	1.9
Responsibility for cooking at home	Yes	113	34.9
	No	208	64.2
	No response	3	0.9
Total		324	100.0
Family members <sup>1)</sup>		3.73±1.43	
Dining out per week <sup>1)</sup>		3.93±2.83	
Past experience visiting Korea <sup>1)</sup>		1.26±2.67	
Eating Korean foods per month <sup>1)</sup>		2.12±2.24	

<sup>1)</sup> Mean±SD.

one-person households (30.9%), three-generation households (21.6%), and households with only married couples (7.1%); the average family consisted of 3.73 people. Results also revealed that respondents dined outside home 3.93 times per week, on average, and the ratio of consumers responsible for cooking at home (34.9%) was smaller than that of consumers not responsible for cooking (64.2%). Convenience orientation positively relates to the use of restaurants and take-away meals, while it negatively relates to the use of self-prepared meals and involvement with cooking (Candel MJJM 2001, Brunner TA et al. 2010). Therefore, the result apparently shows the tendency for convenience-oriented consumption among Singaporean consumers. This might be stemmed from Singapore's demographic factors. According to the Food Export USA (2011), Singaporean consumers are shifting their food consumption to convenience foods, ready meals, and away-from-home dining as the number of working women and aging population is increasing. Respondents reported eating Korean food 2.12 times per month, on average, a result higher than that reported by a previous study (Lee JY et al. 2010) for preferences and perceptions of Korean food among foreign consumers residing in Korea.

## 2. Consumption patterns of HMR products

Table 2 presents the respondents' consumption patterns of HMR products. The results show that the largest number of respondents ( $n=132$ , 40.7%) purchased HMR products one to two times per week and a smaller ratio of consumers purchased HMR products one to three times per month ( $n=70$ , 21.6%) or more than three to four times per week ( $n=68$ , 21.0%). This result suggests that the high-frequency group using HMR products is dominant in the Singapore market. Taste was the primary consideration when purchasing HMR products ( $n=113$ , 34.9%), accounting for more than one-third of all responses, followed by nutritional value ( $n=55$ , 17.0%), price ( $n=20$ , 6.2%), convenience ( $n=17$ , 5.2%), and freshness and hygiene (each with  $n=15$ , 4.6%). This result apparently reflects the convenient food trend in Singapore. Agriculture and Agri-Food Canada (2011a) reported that Singaporean consumers desire to purchase both tasty and nutritious convenient food items. The result also revealed that Singaporean consumers consider more intrinsic factors such as taste and nutritional value rather than extrinsic factors such as price and convenience. This is consistent with the study by Ahlgren M et al. (2004) who indicated taste to be the

most important factor when choosing convenience foods. A study by Bogue J et al. (2006) suggests that the most important element for consumers in the concept of HMR products is taste along with health aspects. Chang HJ et al. (2010) also reported that the most considered attribute in the development of Korean food as a commercial product for foreign consumers is taste and nutrition. Therefore, the quality of intrinsic attributes of Korean ginseng chicken soup as an HMR product such as taste and nutrition should gain greater attention, indicating a need for investigation and evaluation of specific taste preferences, such as a Korean food taste profile for Singaporean consumers, in order to improve success in the development and application of Korean ginseng chicken soup as an HMR product. In addition, the product's developmental strategies

**Table 2.** Consumption patterns of Home Meal Replacement products

Items		Frequency (n)	Percentage (%)
Frequency of purchase	More than 3-4 times a week	68	21.0
	1-2 times a week	132	40.7
	1-3times a month	70	21.6
	Less than 1 time a month	39	12.0
	Never	11	3.4
No response		4	1.2
Factors for consideration	Taste	113	34.9
	Appearance	7	2.2
	Quantity	7	2.2
	Nutritional value	55	17.0
	Price	20	6.2
	Packaging	7	2.2
	Freshness	15	4.6
	Convenience	17	5.2
	Hygiene	15	4.6
	Others	22	6.8
No response		46	14.2
Place of purchase	Hypermarket	172	53.1
	Supermarket	88	27.2
	Convenience store	17	5.2
	Others	22	6.9
	No response	25	7.7
Types of products	Frozen product	107	33.0
	Canned product	51	15.7
	Fresh product sold at a supermarket	79	24.4
	Product sold at a grocery store	26	8.0
	Others	38	11.7
No response		23	7.1
Total		324	100.0

should include slogans emphasizing benefits to health and nutrition. Jago D (2000) suggested that health has become a more important element than before when developing new convenience food products. In several studies, convenience appeared to be the most important attribute in the selection of HMR products, but convenience did not rank highly in the results of the current research. In the early market of HMR products, the value attributed to convenience was large, but with gradual exposure to convenience food of varying types, more dimensions seem relevant.

More than half of the respondents (n=172, 53.1%) normally purchased at hypermarkets. This might reflect a trend for Singaporean consumers to move away from traditional stores to larger retailers (Business Monitor International 2015). Singaporean consumers are increasingly shopping at big box retailers because of the larger selection with convenience and to satisfy the increased interest in imported foods, such as a variety of ethnic foods (Agriculture and Agri-Food Canada 2011b, Euromonitor International 2012). Frozen food (n=107, 33.0%) was the most commonly purchased type of HMR product, followed by fresh food sold in supermarkets (n=79, 24.2%) and canned products (n=51, 15.7%). This result may arise from consumers' recognition of the advantage of long shelf-life of frozen food and health benefits of fresh food.

### 3. Optimized concept for Korean ginseng chicken soup

Pearson's  $r$  is the correlation coefficient between the ob-

served preference and the estimated preference based on a scale that represents suitability for the conjoint model. A Pearson's  $r$  above 0.7 signifies a high correlation (Asuero AG et al. 2006). In the results of this study, the Pearson's  $r$  was 0.903 ( $p < 0.001$ ), implying that the model's suitability is extremely high. In addition, since Kendall's tau, which presents the correlation between the virtual profile and test profile used during model development, was 0.745 ( $p < 0.001$ ), the 16 extracted profiles are valid. Table 3 presents the relative importance and utilities of the attribute levels of Korean ginseng chicken soup as an HMR product, estimated through the conjoint analysis. In terms of consumers' selection of the product, "package form" (32.4%) was the primary consideration, followed by the attributes "form of chicken" (32.1%), the primary ingredient, "inclusion/exclusion of glutinous rice" (13.8%), "soup flavor" (11.6%), and "form of ginseng" (10.0%). Consumers see the visual elements, such as products' packaging before reading the detailed label for contents of products; hence, the shape and color of a product's packaging play a very important role (Garber LL et al. 2008). The packaging characteristics of products also suggest a specific identity regarding the product's content and are determinant in enhancing or interfering identity or evaluation (Cardello AV et al. 1985, Spence C & Gallace A 2011). Therefore, improvement of visual appearance could increase the success of Korean ginseng chicken soup as an HMR product in the Singapore market. Among the packaging options, consumers showed a higher preference for "partially transparent" (0.560) compared to "transparent"

**Table 3.** Utility and relative importance of five chosen attributes in hypothetical cases

Attributes	Level	Utility	Relative importance (%)	Utility * Relative importance
Packing	Transparent	0.406	32.4	13.154
	Partially transparent	0.560		18.144
	Opaque	-0.966		-31.298
Chicken	1 whole chicken	0.135	32.1	4.334
	1/2 chicken	0.047		1.509
	Chicken piece	-0.182		-5.842
Ginseng	Mixed in its original form	0.053	10.0	0.530
	Mixed after grinding	-0.053		-0.530
Glutinous rice	Included	0.220	13.8	3.036
	Not included	-0.220		-3.036
Soup	Salted	-0.046	11.6	-0.534
	Seasoned with soy sauce	0.046		0.534

Pearson's  $r = 0.903$  ( $p < 0.001$ ).

Kendall's tau = 0.745 ( $p < 0.001$ ).

(0.406) and “opaque” (-0.966). However, more detailed attributes such as the size of ginseng, content of glutinous rice, and degree of soy flavor should be complementary, and the results may direct product developers to determine the most appropriate and localized profile for Korean ginseng chicken soup as an HMR product. With regard to the form of chicken, the second most important attribute, consumers showed the highest level of preference for “a whole chicken” (0.135). Consumers also preferred “inclusion of glutinous rice” (0.220), “seasoned with soy sauce” (0.046), and “ginseng mixed in its original form” (0.053). According to the report of Korean Food Foundation (2012b), the type of grain most preferred by Singaporean consumers was rice, followed by glutinous rice, and the most preferred spice was soy sauce; these preferences align with the results of the current research. Consumers’ preferences for the 16 virtual profiles of Korean ginseng chicken soup as an HMR product are shown in Table 4. Results show a great diversity of preferences, ranging from -1.468 to 0.927. Respondents showed that the highest preference for Korean ginseng chicken soup as an HMR product is the code J (0.927), which consists of the following attributes: “partially transparent package,” “1/2 chicken,” “ginseng mixed in its original form,” “inclusion of glutinous rice,” and “seasoned with soy sauce.” The second highest prefer-

ence is the code P (0.769): “transparent package,” “a whole chicken,” “ginseng mixed in its original form,” “inclusion of glutinous rice,” and “salted.” On the other hand, consumers least preferred the code N (-1.468): “opaque package,” “chicken pieces,” “ginseng mixed after grinding,” “non-inclusion of glutinous rice,” and “salted.”

#### 4. Choice simulations for Korean ginseng chicken soup as an HMR product

According to Green PE & Krieger AM (1991), conjoint analysis estimates new multi-attribute products, optimal utility levels, and market shares in competitive products. New multi-attribute products and the optimal concept for Korean ginseng chicken soup as an HMR product in the Singapore market are shown in Table 4; a product prepared with half a chicken, mixed with ginseng in its original form, seasoned with soy sauce, inclusion of glutinous rice, and packaged in a partially transparent material. In addition, the second preferred HMR product for Korean ginseng chicken soup is a product prepared using a whole chicken, mixed with ginseng in its original form, seasoned with salt, inclusion of glutinous rice, and packaged in a transparent material. Therefore, two alternative HMR products for Korean ginseng chicken soup analyze the market share through choice simulation.

**Table 4.** Preferences for 16 hypothetical products of Korean ginseng chicken soup as a Home Meal Replacement

Rank	Attributes					Sum of utility value	Product code
	Packaging	Chicken	Ginseng	Glutinous rice	Soup		
1	Partially transparent	1/2 chicken	Mixed in its original form	Included	Seasoned with soy sauce	0.927	J
2	Transparent	1 whole chicken	Mixed in its original form	Included	Salted	0.769	P
3	Transparent	1 whole chicken	Mixed after grinding	Included	Salted	0.661	E
4	Partially transparent	Chicken pieces	Mixed after grinding	Included	Seasoned with soy sauce	0.590	K
5	Transparent	1/2 chicken	Mixed after grinding	Included	Salted	0.573	I
6	Partially transparent	1 whole chicken	Mixed in its original form	Not included	Salted	0.483	F
7	Transparent,	Chicken pieces	Mixed in its original form	Included	Salted	0.452	C
8	Transparent	1 whole chicken	Mixed in its original form	Not included	Seasoned with soy sauce	0.421	M
9	Partially transparent	1 whole chicken	Mixed after grinding	Not included	Salted	0.375	G
10	Transparent	1 whole chicken	Mixed after grinding	Not included	Seasoned with soy sauce	0.313	A
11	Transparent	1/2 chicken	Mixed after grinding,	Not included	Seasoned with soy sauce	0.225	O
12	Transparent	Chicken pieces	Mixed in its original form	Not included	Seasoned with soy sauce	0.104	H
13	Opaque	1 whole chicken	Mixed in its original form	Included	Seasoned with soy sauce	-0.511	L
14	Opaque	1 whole chicken	Mixed after grinding	Included	Seasoned with soy sauce	-0.619	D
15	Opaque	1/2 chicken	Mixed in its original form	Not included	Salted	-1.131	B
16	Opaque	Chicken pieces	Mixed after grinding	Not included	Salted	-1.468	N

**Table 5.** Market share of a Korean ginseng chicken soup as a Home Meal Replacement

Rank	Product code	Market share (%)		
		Max utility	BTL	Logit
1	J	100.0	50.4	54.0
2	P	0.0	49.6	46.0

The most preferred methods of choice simulation are the maximum utility (max utility) model, the Bradley-Terry-Luce (BTL) model, and the logit model. The maximum utility model tends to overestimate the market share, while the BTL and logit models tend to underestimate the market share (Gil JM & Sánchez M 1997). In other words, the first-choice profile's market share is a high probability of 100% using the maximum utility model, but not everyone likes the same product in the real world. Therefore, the BTL and logit models are more realistic than the maximum utility model.

The result of market share through choice simulation is shown in Table 5. The code J, most preferred Korean ginseng chicken soup, gains potential market share from maximum utility of 100.0%, BTL of 50.4%, and logit log-linear model of 54.0%. The second preferred Korean ginseng chicken soup by Singaporean, which is the code P, gains potential market share from maximum utility of 0.0%, BTL of 49.6%, logit log-linear model of 46.0%.

#### IV. Summary and Conclusion

This study showed that apparently the most important considerations among Singaporean consumers when purchasing HMR products are taste and nutritional value. Yet, the result of conjoint analysis showed that packaging greatly influences Singaporean consumers' preferences for Korean ginseng chicken soup as an HMR product, although taste is the most dominant consideration when purchasing HMR products, in general. This result identifies a gap between consumers' choices for HMR products in actual purchase situations and the general attitudes toward HMR products. It represents consumers' varying trade-off decisions in specific purchase situations and in the general HMR market. Regarding an optimized concept, a product cooked with half a chicken, mixed with ginseng in its original form, seasoned with soy sauce, inclusion of glutinous rice, and packaged in a partially transparent material is the preference.

The result obtained through conjoint analysis in this study clarifies Singaporean consumers' preference for Korean ginseng chicken soup as an HMR product and thereby provides an important insight to develop an effective and efficient strategy for the Singapore market. A consumer-oriented research method such as conjoint analysis, used in this study, enhances understanding of consumers' choices for food and adds value to determining successful opportunities for new product development. It also contributes to the development of optimal concepts for products by providing direction and guidelines to marketers.

This study has significance in that it extends beyond a simple investigation of foreign consumers' preferences and actually contributes to the development of an optimized concept for a specific Korean dish as an HMR product and provides a foundation for processing other Korean dishes into HMR products by serving as a useful reference for globalizing the Korean food industry.

Nevertheless, this research has limitations arising from an inability to generalize its results beyond a single country. In addition, the application is only for a few selected attributes and levels of those attributes of HMR products. Consequently, the importance and value of other attributes not used in this analysis remain unknown. Moreover, food preference is only one predictor for selecting food, and hence the analysis may not apply in a specific situation.

In the future research, first, a sensory test could increase the validity of the results. Second, a foundation for differentiated marketing strategies for Korean ginseng chicken soup as an HMR product could arise from identifying segmented markets by analyzing a base of Singaporean customers according to the interpretation of lifestyle characteristics. Finally, investigation of consumers in other countries with various cultural characteristics, for the purpose of developing more varied Korean HMR products, is also possible.

#### Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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