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Home Meal Replacement Market Segmentation: A Food-Related Life Style

Hyebin Jo, Seoyoun Lee, Younchan Choe

**Seoul National University
Agricultural Economics and
Rural Development
Jhb243@naver.com
nshaoba@hotmail.com
aggi@snu.ac.kr**

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Abstract

The Home Meal Replacement (HMR) sector has been growing rapidly in the food industry. Due to the conveniences that the HMR product offers, the target consumers are generally busy workers and/or individuals who live alone. This study aims to investigate factors that affect the purchasing of HMR products and to formulate strategies for future HMR product sales. This study examines the effect of five independent variables: dine-out frequency, dine-out costs, and the employment status of housewives, involvement of meal preparation, and the role of overload on HMR purchase behavior. The study also examines what influences the purchasing of HMR products through different kinds of lifestyles. Surveys were conducted with a panel of housewives from major metropolitan areas in South Korea and configured by clusters according to different lifestyles. The panel of housewives was divided into four groups based on Food Related Lifestyles: Price Insensitive Group, Pride in Cooking Group, Indifference to Health Group and Against Eating Out Group. The results indicate that HMR sales target segments are consumers who tend to dine-out more and desire a low involvement in meal preparation than consumers who are busy and have less time to cook at home.

Keywords: Buying behavior, Food-related life style (FRL), Home meal replacement (HMR), Market segmentation, Role overload, Working status of wives

Introduction

The Home Meal Replacement (HMR) was created by retailers and grocers in the mid-90s to compete with the restaurant industry. HMR refers to pre-cooked, ready-to-eat meals purchased from grocery stores in packaged take-out containers. In the United States, three out of four supermarkets sell HMR products (Moomaw, 1996). The main HMR products in the United States are various processed meat products, salad with fresh vegetables, fruits and bread.

The HMR sector has been growing rapidly in the food industry. According to consumer research conducted by the National Restaurant Association (NRA) in 2000, four out of ten adults do not consume meals at home and three out of ten adults consumed packaged foods (Jung, 2005). According to the Global Industry Analysis, HMR is estimated to reach 91 billion U.S. Dollars in sales by 2014 in the global market (Fang et al., 2013).

The HMR industry in South Korea (hereafter, Korea) started in 2000 and is likely to expand because of the increasing number of working women, hardworking single-person households, and the elderly population (Jang et al., 2011). Especially, HMR products have a close relationship with housewives who are in charge of the housework. As the number of working women increases, women tend to prefer HMR food, which requires less cooking time for preparing a family meal. Thus, HMR appears to solve busy consumers' problems such as the lack of time, lack of skill, and the lack of desire to prepare food (Larson, 1998).

The HMR market is growing rapidly. However, there are still few existing studies that have been conducted on consumers' attitudes and purchase intention toward HMR. The results of existing national research studies show that job satisfaction was a common and popular topic in relation to HMR studies that used role theory. In contrast, there is insufficient research on HMR consumption related to convenience consumption. Furthermore, there is no existing HMR study that used actual purchase data.

Presently, more housewives are seeking advancement in society. However, there has been no improvement in research that involves employed housewives as the subject. Thus, the main purpose of this study is to examine housewives' purchase patterns of HMR and to see if role overload has an effect on convenience consumption. This study classifies groups of panels based on their food-related lifestyle and examines the differences and similarities for the effects of the independent variables on HMR purchase behavior. This study examines the effects of the independent variables: employment status of housewives, involvement in meal preparation, work overload, dine-out frequency, and dine-out costs on HMR product purchase intention.

Hypothesis Development

1. Definitions of HMR and HMR consumer characteristics

The definition of HMR varies according to various studies. Casper (1997) defines HMR products that have high quality and reasonable pricing and can be cooked at home if consumers have time, technique, and motivation. HMR professionals in the United States define HMR as a convenient food excluding general fast food. Supermarkets in the United States define HMR as precooked foods that partially need to be cooked at home. Gibson (1999) placed HMR at the top of the fast food market and defined HMR as ready-to-eat food that can be consumed off-premises after heating. Costa et al. (2001) defined HMR as a replacement of a homemade meal that can be consumed in a short time and consists of a combination of nutritional value such as proteins, carbohydrates, and vegetables. In summary, HMR is a home meal replacement that can be conveniently cooked.

Creed (2001) states that consumers with high dine-out frequency have a higher perception for the importance of instant food production and process and have a high tendency to try new foods. Bak (2002) chose fourteen dine-out motivations (e.g., 'lack of

meal-preparation people or ingredients' and 'to save cooking time'). The background for the development of the dine-out motivations has a similar background with HMR development (Moonmaw, 1996). Thus, HMR consumption has a close relationship with dine-out motivations.

H1: Dine-out frequency has a positive correlation with HMR consumption.

H2: Dine-out cost has a positive correlation with HMR consumption.

There is an increase in the advancement of women's entry into society. Many existing studies have examined the effect for the employment status of housewives on convenience consumption. Becker (1965) developed the hypothesis that employed housewives compared to full-time housewives consume more convenience products because they have less time to prepare a meal (Becker, 1965; Scholderer and Grunert, 2005; Thomas et al., 2010). However, this study did not find a correlation for employment status and convenience consumption. Strober and Weinberg (1977) examined time-saving durables and other durable goods. They found no relationship between employment status and consumption. Kim (1989) controlled income and found an increase of time-saving durables ownership depending on the employment status of housewives. However, this study could not find the effect of employment status of housewives on convenience foods consumption behavior. Thus, the employment status of housewives does not have a meaningful correlation with HMR consumption.

H3: Employment status of housewives does not have a correlation with HMR consumption.

Because there is no clear correlation between the employment status of housewives

and convenience consumption, some existing studies used role theory and role overload to understand convenience consumption behavior (Joag, Gentry, and Ekstrom, 1991; Reilly, 1982; Schaninger and Allen, 1981; Zeithaml, 1985; Oropesa, 1993). The studies assumed that employed housewives purchase time-saving products to save time and energy on housework. Reilly (1982) conducted a study on housewives and found that when work involvement increases, role overload also increases, which leads to an increase in convenience food consumption. Joseph and Robert (1986) also found that consumers with high role overload consumed convenience products. However, this study found that there are other moderating effects between role overload and HMR consumption such as housewives with high role overload tend to use discount coupons, which is far from convenience purchasing behavior.

Candel (2001) found that cooking enjoyment and convenience consumption have a negative correlation, whereas role overload has a positive correlation with convenience consumption. Joag et al. (1991) specified role overload based on goals and examined a correlation with time-saving products. This study found that employed women's high role and goal does not influence the purchase of time-saving products. Specifically, housewives with strong goals at work tend to ask help from family than to purchase time-consuming products. However, housewives with high goals at home tend to purchase time-consuming products. As such, the effect of role overload varies depending on the situation. This study examines the correlation between role overload of HMR consumers in Korea and their HMR purchase behavior.

H4: Role overload and HMR consumption have a positive correlation.

H5: Involvement of meal preparation and HMR consumption has a negative correlation.

2. Food-Related Lifestyle

The consumer segment research related to food-related lifestyle does not follow previous lifestyle theory, but applies diverse segment criteria (i.e., demographic, social statistics, motivation/attitudinal factors) in a food lifestyle domain and its related market. Food-Related Lifestyle (FRL) is sub-criteria, which is one of the more developed theories (Wycherley, McCarthy, and Cowan, 2008). FRL is a different concept than general lifestyle (Grunert, Brunso, Bisp and MAPP 1993). To measure lifestyle behavior, a number of studies, such as Rokeach (1973), Kahale, Beatty and Homer (1986), and Schwartz (1992) developed a criterion. These existing studies used five different criteria: shopping method, food quality, cooking method, food consumption behavior, and food consumption motivation. These studies were used in both western countries and Asian countries such as China.

HMR can be classified as convenience consumption and can be differentiated from healthy food consumption because HMR products are processed foods. Thus, the consumer segment with different FRL can have different HMR consumption behavior. Thus, this study examines if the five study hypotheses are different based on a FRL context.

H6: The effect of housewives' dine-out frequency, dine-out cost, employment status of housewives, role overload, and involvement of food preparation on HMR consumption is different depending on consumer segments based on FRL.

Methodology

The subjects of this study are housewives from major metropolitan areas in Korea. From October 2009 until December 2012, the Rural Development Administration in Korea collected 703 panel grocery receipts, which contains information on the product name, purchase data, and the purchase amount. This study used data from 684 panel data, which have HMR purchase history. In addition, surveys were conducted with a panel of housewives

in 2013. The survey measures panels' food-related lifestyle, role overload, and the involvement of meal preparation. The total collected survey answers were 755. However, among the data from 684 panels, 575 survey data were used after excluding the missing data.

Based on HMR classification level used in the study by Cosat et al. (2001) and Na (2006), HMR product lists used in this study include sushi roll (gimbap), ready-to-eat side dish, cereal, soup, instant curry, instant rice, frozen noodle, and frozen stir-fried rice cake (topokki).

The dependent variable is HMR purchase proportion, which examines HMR purchase behavior. HMR purchase proportion was calculated by dividing the total grocery purchase cost by the HMR purchase cost.

The independent variables are employment status of housewives, dine-out frequency and costs, role overload, and involvement of meal preparation. In addition to the data on the grocery receipts, the Korean Rural Development Administration collected data that we used for other variables such as the number of family members and the number of children, dine-out costs and frequency, education level, employment status of the housewives, and income. However, this study uses two independent variables: employment status of housewives, and dine-out cost and frequency. The employment status of the housewives was measured by asking participants to choose between the two options of employed housewife and full-time housewife. The participants wrote their dine-out cost per month on the survey and were asked to choose dine-out frequency options on a six-point Likert-type scale: once per six months, once per three months, once per two months, once per month, twice per month, and three times per month.

The survey contains thirty-four questions that measure FRL, four questions that measure role overload, and two questions that measure the involvement of meal preparation. Grunert et al. (2010) used questions that relate to FRL in China. These FRL questions were

proven to be applicable to countries in Asia. This paper used a modified version of the FRL questions, which was used in a study by Kim (2012) regarding consumers of basket products in Korea. From twelve role overload questions used in a study by Reilly (1982), Palaniappan et al. (2006) conducted a confirmatory factor analysis and chose six questions. Among these six questions, four questions, have a Cronbach's alpha value higher than .7, and thus, were chosen for this study. In reference to questions on work involvement used in a study by Reilly (1982), this study regarded meal preparation as work and modified the questions from the "involvement of work" to "involvement of meal preparation." The first question was also modified from "part time" and "full time" to "time consumption" referring to Sarbin (1969) because this paper is focused on measuring the involvement of meal preparation.

First, we segmented consumers based on their FRL and we examined factors that influence each segment in HMR purchases. IBM SPSS Statistics 21 was used for the data analysis. To determine the number of clusters, hierarchical clustering methods were used, and then an ANOVA was conducted to verify the difference between each segment. To segment consumers, the K-mean method was applied, which is a non-hierarchical grouping technique used in Cluster Analysis. After grouping the consumers, hierarchical regression was used to examine the effect of role overload, involvement in meal preparation, housewife employment status, and dine-out frequency and costs on HMR purchase for each consumer segment. In addition, a PLS-Graph program was used to conduct confirmatory factor analysis, which decreased the observed variable level of role overload and involvement in meal preparation.

Results

Cluster Analysis of Food Lifestyle

In this study, we conducted a K-mean cluster analysis for 684 panels. The k-mean cluster analysis is a non-hierarchical cluster analysis. However, the k-mean cluster analysis

has limitations as researchers have to decide the number of clusters. Thus, we first conducted a hierarchical cluster analysis to objectively determine the number of clusters. ‘Euclidean squared distance’ was used for case distance in the hierarchical cluster analysis. The hierarchical cluster analysis drew a total of 683 stages. Table 4 show the largest change in aggregate coefficient, which is at the stage of 680. According to the stopping rule, four clusters were determined. Group 1 had 107 panels, group 2 had 244 panels, group 3 had 120 panels, and group 4 had 213 panels.

After we found the number of clusters, we conducted a k-mean cluster analysis. Table 5 shows that group 1 had a price insensitive characteristic because ‘price when shopping’ and “price for food quality” had a negative effect. Group 2 shows that ‘new cooking method,’ ‘plans’ and ‘pride’ in cooking had the highest positive effect, which characterized this group as the “pride in cooking group”. Group 3 is named ‘indifference to health group’ as ‘information when shopping’, ‘quality additives’ and ‘freshness’ had negative effects. The last group is named ‘Against Eating-Out Group’ and has a negative effect for the enjoyment of eating-out. An ANOVA was conducted to verify the difference in clusters. Table 6 shows that there is a clear difference in clusters as p-values of food lifestyle variables are below 0.01.

Demographic characteristic based on Food Lifestyle

Table 7 demonstrates the demographic characteristics for segmentation of clusters based on food lifestyle. For cluster 1, the average number of family members is 3.7 and the average number of children is 1.8. The average panel age is 46.6 and full-time housewives comprise 45% of the panels. The dine-out frequency is about twice per month and the dine-out cost is 111,075 Korean Wons (110 U.S. Dollars). For cluster 2, the average number of family members is about 3.8 and the average number of children is 1.8. The average panel age is 46.9 and full-time housewives comprise 57% of the panels. The dine-out frequency is

about twice per month and the dine-out cost is 104,060 Korean Wons (100 U.S. Dollars). For cluster 3, the average number of family members is 3.8 and the average number of children is 1.8. The average panel age is 44.3 and full-time housewives comprise 49% of the panels. The dine-out frequency is twice per month and the dine-out cost is 118,208 Korean Wons (120 U.S. Dollars). For group 4, the average number of family members is about 3.8 and the average number of children is 1.7. The dine-out frequency is about once per month and the dine-out cost is 90,631 Korean Wons (90 U.S. Dollars).

The average number of family members and children, and the education level were similar for the four clusters. The average panel age for group 3 is 44.3, which is about two years younger than the other groups. Group 4 had the oldest panels where the average age was 47.2. Groups 2 and 4 had the highest proportion of full-time housewives. However, panel income was low. The household income for groups 1 and 2 was about 500 dollars higher than groups 3 and 4. The dine-out frequency for group 4 was lower than the other three groups. Group 4 panel participants spent less than 100 dollars to dine-out.

Determinants of HMR purchase behavior

Hierarchical regression was used to discover variables that have an influence on HMR purchase behavior. The control variables are the status of living parents, number of children, total income, education level, and the number of people consuming food. The independent variables are dine-out frequency, dine-out cost, employment status of housewives, involvement of meal preparation and role overload.

1. Price Insensitive Group

As illustrated in Table 7, HMR purchase proportion increased as housewives felt overloaded with work. The Price Insensitive Group has relatively high and dual incomes. Thus, when housewives feel role overload, they tend to purchase convenience food products, which leads to the purchasing of HMR products.

2. Pride in Cooking Group

Table 8 shows that none of the independent variables influence HMR purchase proportion. The Pride in Cooking Group has relatively low income and spends less on dine-out. The panel participants purchased raw material at a cheaper price than consuming high price HMR products.

3. Indifference to Health Group

Table 9 shows that as the involvement of meal preparation decreased, HMR purchase proportion increased. This explains why employed housewives do not find the preparation of meals (e.g., less time spent cooking, negative attitude towards cooking) as meaningful. Thus, Indifference to Health Group chose HMR for convenience.

4. Against Eating Out Group

Table 10 shows that panels with high dine-out frequency and low involvement of meal preparation had high HMR purchase proportion. The Against Eating Out Group also has higher dine-out frequency, which resulted in higher HMR products cost per person. Group 4 has a low income and spends less money on a dine-out. This explains why group 4 has relatively low involvement in meal preparation. Thus, group 4 chose dine-out for cheaper prices to substitute meals.

Discussion

This study segmented consumer groups based on their FRL and found factors that affect the purchasing of HMR products. The panel of housewives was divided into four groups based on FRL: Price Insensitive Group, Pride in Cooking Group, Indifference to Health Group, and Against Eating-Out Group.

The results indicate that the employment status of housewives did not have any influence on HMR purchase behavior. This finding supports previous studies, such as Strober and Weinberg (1977); Kim (1989); Becker (1965), that there is no correlation between

employment status and convenience consumption. Among the five independent variables, the involvement of meal preparation and dine-out frequency had an important influence on HMR purchase proportion. This finding supports Creed (2001)'s study that consumers who have high dine-out frequency have higher perception for the importance of instant food production. In addition, In conclusion, the employment status of housewives is not an important factor that influences HMR purchase behavior. Rather, housewives who dine-out more and have less involvement of meal preparation tend to purchase more HMR products.

From the results, this study proposes appropriate sales strategies for each group. Table 11 shows that the participants in the Price Insensitive Group tended to spend more money on eating out and purchasing HMR products. The main factor of work overload drove housewives to purchase HMR products. For the work overload group, marketing high quality products with high convenience is important. For the Pride in Cooking Group, the participants tended to spend less on dine-out and none of the factors influenced HMR purchase behavior. Because the participants had pride in cooking, the HMR products that need much cooking time can be marketed to this group. Conversely, the least amount of involvement in cooking time meant higher consumption levels of HMR in the Against Eating Out Group. In addition, the more frequently a person eats out, the HMR purchases and the purchases of different grades of products per person increased. The Against Eating Out Group does not have a willingness to cook at home. Thus, the more appropriate HMR products are simple and convenience products.

This study has limitation in that HMR product lists are only based on the HMR classification level used in the study by Cosat et al. (2001) and Na (2006). For the future research, research of a wide range of products is necessary. In addition, as the number of single-person households is increasing, the future research can include single-person households who have high tendency to consume HMR products.

Reference

- A.I.A. Costa, M. Dekker, R.R. Beumer, F.M. Rombouts., and W.M.F. Jongen. (2001). A consumer-oriented classification system for home meal replacements. *Food Quality and Preference* 12. 229-242.
- Back Young-Chang, Kim Na-Hie. (2002). *Tourism and Leisure Research*, Vol. 15 No 2.
- Becker, Gary S., (1965). A theory of the allocation of time. *Economic Journal* 75, 493-517.
- Casper. (1997). *Journal of Consumer Research*, Vol. 4, No. 3, 141-147.
- Chankon Kim. (1989). Working wives' time-saving tendencies: Durable ownership, convenience food consumption, and meal purchases, Volume 10, Issue 3, 391-409
- Creed, PG. 2001. The Potential of food service systems for satisfying consumer needs. *Innovative Food Science & Emergine 194 Technologies*2: 219-227.
- Fang. Cheng-hsi, Huang. Yueh-Chuen, and Chiu. Yu-Yeh. (2013). The Shift to Home Meal Replacement Consumption in Convenience Stores; *Journal of Food Studies*, Vol. 2, No.1
- Gibson.M.(1999),HomeMealReplacementinEuropeRevolutionorEvolution?, *The Hospitality Review*, Vol 4.
- Grunert, Brunso, Bisp., and MAPP. (1993). Food-related life style: Development of a cross-culturally valid instrument for market surveillance. MAPP working paper no 12, October 1993, Denmark.
- Larson. Ronald B. (1998). The Home Meal Replacement Opportunity: A Marketing Perspective, Working Paper 98-01. The Retail Food Industry Center University of Minnesota
- Jang, Y.J., Kim, W.G., and Yang, I.-S (2011). Mature consumers patronage motives and the importance of attributes regarding HRM based on the food-related lifestyles of the upper

- middle class. *International Journal of Hospitality Management*, 30(1), 55-63.
- Joseph A. Bellizzi., & Robert E. Hite. (1986). Convenience Consumption and Role Overload Convenience. *Journal of The Academy of Marketing Science*, Vol.14, No4, 001-009.
- Thomas A Brunner, Klazine Van der Horst, Michael Siegrist.(2010). Convenience food products. Driver for consumption. Reserch Report. *Appetite* 55. 498-506
- Kahle, L. R., Beatty, S. E., and Homer, P. (1986). Alternative measurement approaches to consumer values: the list of values (LOV) and values and life style (VALS). *Journal of consumer research*, 405-409.
- Michael D. Reilly. (1982). Working Wives and Convenience Consumption. *THE JOURNAL OF CONSUMER RESEARCH*, Vol.8, No4, 407-418
- Moomaw. (1996). P.Home mealreplacementfindsitsplace atthe table. *Restaurant USA*. Nov,1996 (<http://www.restaurant.org/rusa/magArticle.cfm?ArticleID=220>)
- M.J.J.M. Candel. (2001). Consumers' convenience orientation towards meal preparation: conceptualization and measurement, *Appetite*, Vol 36, Issue 1, 15–28.
- Myra H. Strober., and Chares B. Weinberg. (1977). Working Wives and Major Family Expenditures. *THE JOURNAL OF CONSUMER RESEARCH*, Vol.4, No3, 141-147.
- Oropesa. (1993). Female Labor Force Participation and Time-Saving Household Technology: A Case Study of the Microwave from 1978 to 1989, *Journal of Consumer Research*, Vol. 19, No. 4, 567-579.
- Palaniappan et al. (2006). A Confirmatory Factor Analysis of Reilly's Role Overload Scale. *Educational and Psychological Measurement*, Vol.66, No. 4, 657-666.
- Rokeach, M. (1973). *The nature of human values*: Free press.
- Sarbin T.R. & Allen Vernoon L. (1969). Role Theory. In G. Lindzey & Aronson(Eds).

Handbook of Social Psychology, Vol. 1(2nd ed.). Reading, Mass : Addison-Wesley. P493

Schaninger., and Allen. (1981), Wife's Occupational Status as a Consumer Behavior

Construct, Journal of Consumer Research Vol. 8, No. 2, 189-196

Scholderer., & Grunert (2005), Consumers, food and convenience: The long way from

resource constraints to actual consumption patterns, Journal of Economic Psychology, Vol

26, Issue 1, 105–128

Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical

advances and empirical tests in 20 countries. *Advances in experimental social psychology*,

25(1), 1-65.

SG Joag, JW Gentry, K Ekstrom. (1991), An Investigation of a Role/Goal Model of Wives'

Role Overload Reduction Strategies. *Advances in Consumer Research*. Vol. 18 Issue 1,

666-672.

Valarie A. Zeithaml, (1985). The New Demographics and Market Fragmentation, *Journal of*

Marketing Vol. 49, No. 3, 64-75.

Tables & Figures

Table 1. Food-Related Lifestyle Measurement

Category	Sub-Category	Items	Survey
Shopping Method (SM)	Information (I)	SMI1	Food information is important
		SMI2	Information about food ingredient origin is important.
		SMI3	Information about food ingredients' producers is important.
		SMI4	I want to know ingredients in processed food.
	Price (P)	SMP1	I always check prices even when purchasing small items.
		SMP2	I know changes in food ingredients that I often buy.
Food Quality (FQ)	Quality, Additives (A)	FQA1	I like buying fresh food without the addition of preservatives.
		FQA2	Natural food, freshness and unprocessed food, is important.
		FQA3	I want to avoid food that has additives.
	Product Price (P)	FQP1	I always try hard to buy cheap and high quality food ingredients.
		FQP2	I check food prices for household economy.
		FQP3	I expect quality of food ingredients to meet the price.
	Taste (T)	FQT1	I think the taste of food is important.
		FQT2	The priority of meal preparation is to cook deliciously.
	Freshness (F)	FQF1	I like fresh food than canned or frozen products.
		FQF2	I think the freshness of food is important.
Cooking Method (CM)	New Method (N)	CMN1	I like trying new method when cooking.
		CMN2	I seek for diverse cooking method for special meals.
		CMN3	I try traditional food recipe.
	Help (H)	CMH1	My family helps when cooking.
		CMH2	My family helps when preparing meals (placing dishes, etc.)
	Plan (P)	CMP1	I plan out men before I cook.
CMP2		I plan out menu every week.	

Category	Sub-Category	Item	Survey
Buying Motivation (BM)	Confidence (I)	BMI1	When I get complimented with the food I made, my confidence raises.
		BMI2	For me, eating is joyful as it satisfies my senses.
		BMI3	I feel myself as excellent cook.
	Safety (R)	BMR1	I do not like changing eating habits.
		BMR2	I only purchase food that I know well.
		BMR3	Familiar cooking makes me comfortable.
Social (S)	BMS1	When I am cooking with friends, being with friends is the most important.	
	BMS2	People can have good conversation after meals.	
Propensity to Consume (PC)	Dine-out (O)	PCO1	For my family, dine-out is regular event.
		PCO2	I sometimes enjoy meals with friends.
		PCO3	I like eating-out with family or friends.

Table 2. Role Overload Measurement

Category	Item	Survey
Role Overload (RO)	RO1	I have to do things which I don't really have the time and energy for
	RO2	I need more hours in the day to do all the things which are expected of me.
	RO3	I can't ever seem to get caught up.
	RO4	I have hard time finding my own time

Table 3. Involvement Measurement

Category	Item	Survey
Involvement (IV)	IV1	How many hours in a day do spend to prepare meals?
	IV2	What do you think about preparing meals?

Table 4. The number of clusters obtained from hierarchical cluster analysis

Stage	Number of clusters	Coagulation Coefficient	Change ratio of coagulation coefficient as a decrease of the number of clusters
⋮	⋮	⋮	⋮
669	15	29.866	2.5%
670	14	30.626	2.1%
671	13	31.274	0.3%
672	12	31.368	3.1%
673	11	32.358	1.2%
674	10	32.744	3.5%
675	9	33.940	0.6%
676	8	34.149	6.4%
677	7	36.489	6.3%
678	6	38.948	7.7%
679	5	42.213	2.5%
680	4	43.295	10.6%
681	3	48.433	23.2%
682	2	63.090	5.4%
683	1	66.677	-

Table 5. The result of cluster analysis

	Clusters				F	Significance Probability
	1 (n=107)	2 (n=244)	3 (n=120)	4 (n=213)		
Checking price	-1.341	.510	-.200	.265	163.555	.000
Product price	-.892	.550	-.550	.240	121.999	.000
New cooking method	-.658	.715	-.554	-.129	106.120	.000
Plan for menu	-.673	.735	-.567	-.171	112.293	.000
Confidence	-.503	.678	-.490	-.217	81.416	.000
Information when shopping	-.495	.546	-.875	.218	117.131	.000
Freshness	.086	.475	-1.194	.210	173.023	.000
Additives	-.240	.522	-1.073	.242	143.447	.000
Dine-out enjoyment	.445	.267	-.093	-.462	32.299	.000
Social	-.297	.571	-.430	-.209	50.355	.000
Safety	.101	.291	-.264	-.196	13.821	.000
Help	-.122	.498	-.326	-.287	35.865	.000
Taste	-.064	.570	-.442	-.264	55.790	.000

Table 6. Clusters' demographic characteristics

	Group 1 (n=107)		Group 2 (n=244)		Group 3 (n=120)		Group 4 (n=213)	
	Average	Standard deviation	Average	Standard deviation	Average	Standard deviation	Average	Standard deviation
Number of family	3.7	1.0	3.8	1.1	3.8	0.9	3.8	1.0
Number of children	1.8	0.7	1.8	0.8	1.8	0.8	1.7	0.7
Parents living with family	0.1	0.4	0.1	0.5	0.1	0.3	0.1	0.5
Panel age	46.6	7.6	46.9	7.9	44.3	8.2	47.2	7.8
Education level	2.4	0.6	2.4	0.7	2.3	0.6	2.3	0.7
Status of employment status	0.45	0.50	0.57	0.50	0.49	0.50	0.61	0.49
Panel income	1.0	1.6	0.6	0.9	0.7	0.9	0.5	1.0
Household income per month	4.9	2.6	4.8	2.7	4.3	2.5	4.3	2.5
Dine-out frequency	5.5	1.9	5.5	1.7	5.5	1.9	5.0	2.0
Dine-out cost	111,075	99,311	104,060	91,304	118,208	88,512	90,631	70,231
Number of family who consume breakfast	0.71	0.33	0.76	0.27	0.70	0.32	0.73	0.31
Number of family who consume lunch	0.31	0.29	0.29	0.25	0.30	0.30	0.36	0.30
Number of family who consume dinner	0.79	0.23	0.82	0.24	0.78	0.24	0.79	0.26

Table 7. The result of regression analysis for group 1

Model		HMR				Changes in R ²	
		Standardization Coefficient	t	Tolerance	R ²		
		Non-standardization Coefficient			(VIF)	(Modified R ²)	
Contrl variable	(constant)	-4.54*	-27.5			0.17 (0.12)	0.07
	Grandparents living together	-0.10 (-0.05)	-0.47	0.82 (1.22)			
	Number of children	0.03 (0.05)	0.45	0.77 (1.29)			
	Total income	-0.06 (-0.13)	-1.14	0.68 (1.48)			
	Education level	0.41* (0.36)	3.40	0.76 (1.32)			
	People eating	-0.10 (-0.17)	-1.78	0.91 (1.1)			
	Dine-out frequency	-0.02 (-0.06)	-0.56	0.75 (1.34)			
Independent Variable	Dine-out cost	0.00 (0.17)	1.57	0.72 (1.39)		0.24 (0.16)	
	Employment status of housewives	0.06 (0.05)	0.47	0.71 (1.41)			
	Involvement in meal preparation	-0.07 (-0.14)	-1.41	0.93 (1.07)			
	Role overload	0.13* (0.2)	1.98	0.87 (1.15)			

Table 8. The result of regression analysis for group 2

Model		HMR				Changes in R ²	
		Standardization Coefficient	t	Tolerance	R ²		
		Non-standardization Coefficient			(VIF)	(Modified R-squared)	
Contrl variable	(constant)	-4.58*	-32.1			0.01 (-0.01)	0.03
	Grandparents living together	-0.03 (-0.01)	-0.20	0.83 (1.2)			
	Number of children	0.02 (0.04)	0.52	0.80 (1.26)			
	Total income	0.03 (0.05)	0.63	0.69 (1.46)			
	Eduacation level	0.02 (0.02)	0.30	0.90 (1.11)			
	Number of people eating	0.03 (0.05)	0.67	0.97 (1.04)			
	Dine-out frequency	0.04 (0.13)	1.80	0.82 (1.22)			
Independent variable	Dine-out cost	0.00 (-0.02)	-0.27	0.82 (1.22)		0.04 (-0.01)	
	Employment status of housewives	-0.01 (-0.01)	-0.15	0.74 (1.36)			
	Involvement in meal preparation	-0.04 (-0.08)	-1.10	0.96 (1.04)			
	Role overload	0.03 (0.06)	0.83	0.92 (1.09)			

Table 9. The result of regression analysis for group 3

Model		HMR				
		Standardization Coefficient	t	tolerance	R-squared	Changes in R-squared
		Non-standardization Coefficient		(VIF)	Modified R-squared	
Control Variable	(Constant)	-4.30*	-23.9			0.04
	Grandparents living together	0.17 (0.07)	0.69	0.89 (11.2)	0.09 (0.04)	
	Number of children	0.16* (0.28)	271	0.78 (12.8)		
	Total income	-0.01 (-0.01)	-0.07	0.57 (17.6)		
	Education level	0.07 (0.06)	0.62	0.84 (1.2)		
	People eating	-0.04 (-0.07)	-0.72	0.85 (11.7)		
	Dine-out frequency	0.02 (0.05)	0.52	0.74 (13.5)		
Independent Variable	Dine-out cost	0.00 (0.01)	0.07	0.74 (13.5)		
	Employment status of housewives	0.02 (0.02)	0.18	0.57 (17.7)		
	involvement of meal preparation	-0.13* (-0.2)	-2.10	0.90 (11.1)		
	Role overload	0.01 (0.01)	0.15	0.83 (1.2)		

Table 10. The result of regression analysis for group 4

Model		HMR				
		Standardization Coefficient	t	Tolerance	R ²	Change in R ²
		Non-standardization Coefficient		(VIF)	(Modified R ²)	
Control Variable	(상속)	-4.70*	-40.6			0.09
	Grandparents living together	-0.25 (-0.12)	-1.70	0.85 (1.17)	0.08 (0.06)	
	Number of children	0.06 (0.1)	1.37	0.91 (1.1)		
	Total income	-0.11* (-0.16)	-2.02	0.71 (1.41)		
	Education level	0.11 (0.09)	1.26	0.82 (1.23)		
	Number of people eating	0.04 (0.07)	0.94	0.90 (1.11)		
	Independent Variable	Dine-out frequency	0.08* (0.27)	3.46		
Dine-out cost		0.00 (-0.09)	-1.18	0.80 (1.25)		
Employment status of housewives		-0.03 (-0.02)	-0.29	0.70 (1.43)		
Employment status of housewives		-0.12* (-0.17)	-2.42	0.91 (1.1)		
Role overload		0.02 (0.03)	0.41	0.85 (1.17)		

Table 11. The result of hypothesis

Divison	Hypothesis	Groups			
		1	2	3	4
Hypothesis 6	The effect of housewives' dine-out frequency, dine-out cost, employment status of housewives, role overload, and involvement of food preparation on HMR consumption is different depending on consumer segments based on FRL.	Accept			
Dependent Variable: HMR purchase proportion					
Hypothesis 1	Dine-out frequency has a positive correlation with HMR consumption.	reject	reject	reject	accept
Hypothesis 2	Dine-out cost has a positive correlation with HMR consumption.	reject	reject	reject	reject
Hypothesis 3	Employment status of housewives does not have a correlation with HMR consumption.	reject	reject	reject	reject
Hypothesis 4	Role overload and HMR consumption have a positive correlation.	accept	reject	reject	reject
Hypothesis 5	Involvement of meal preparation and HMR consumption has a negative correlation.	reject	reject	accept	accept