

The Influence of Household Types on Food and Grocery Store Choices

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Keywords

food market, older adults, one-person households, policy, grocery store

Abstract

This study examines the effect of household type on food and grocery store choices using the 2016 KREI Consumer Behavior Survey for Food (CBSF) data. This study further investigates factors (e.g., socio-economic characteristics, consumer capacities, and store attributes), in relation to food and grocery store choices. There exist significantly different store choices among the household types. The marginal effects from the multinomial logit model show that one-person households are more likely to choose supermarkets as their primary food and grocery stores. In contrast, relatively young (age under 45) multi-person households are more likely to shop their food and groceries in large discount stores. Both elderly (age 65 and up) one-person and multi-person households prefer to go to supermarkets as well as traditional markets. Except for elderly households, all the households are less likely to shop in traditional markets. The implications for growing one-person and elderly households are discussed.

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1. Introduction

The main purpose of this paper is to analyze the influence of household types¹ on food and grocery store choices using the 2016 Consumer Behavior Survey for Food (CBSF) conducted by the Korea Rural Economic Institute (KREI). This study examines households' behavior in choosing the primary food and grocery stores among different retail food and grocery stores² (e.g., supermarkets, super-super markets (SSM), large discount stores, and traditional markets), and investigates how household types influence their food and grocery store choices. The key motivation of the study is the rapid changes in population and household structures in Korea, which are characterized as increasing one-person and elderly households. The share of one-person households approached about 28% of total number of households in 2016 (Statistics Korea, 2017a, 2017b) and its growth rate is the fastest among the OECD countries. The fast growth of one-person households could affect the housing market as well as the food markets (KB Financial Group Inc. Management Research Institute, 2012). Households with heads aged 65 or over (elderly households) are also projected to increase quickly from approximately 3.7 million (about 19% of population) in 2015 to 10.7 million (about 48% of population) in 2045 (Statistics Korea, 2017a, 2017b).

Currently, major food and grocery shoppers in Korea are housewives in general, but food buyers' preferences and retail food and grocery store choices will change along with the rapid growth of one-person and elderly households. Demographic change is an important factor that could influence the food and grocery markets, especially retail stores. Food and grocery retail

1 Household types in this paper refer to the basic division of household into one-person and multi-person household with different (six) age categories, which is described in data section. Household types might be defined differently in other studies or Census.

2 Definitions of retail food stores follow the 2016 KREI Consumer Behavior Survey for Food: Supermarket represents a small to medium size food and grocery store; SSM represents a food and grocery store which is a chain store operated by relatively larger retailers such as Home-plus express, Lotte Super, and E-mart Everyday; large discount store represents a food and grocery store which is operated by large retailers such as E-mart, Home-plus, Lotte Mart; and other market includes department stores (food section), cooperation, online/mail order, and convenience stores.

stores are concerned with how consumer preferences and store choices will be changed in the near future. There are several studies regarding food and grocery store choices (Lee, 2000; Lee and Kwak, 2015; Park et al., 2015), however, previous research has not considered the effect of household types on food and grocery store choices. Further, considering the possible demographic shifts in ages and household structure, investigating factors associated with households food and grocery choices is timely and crucial.

Major retail stores' sales were over 150 trillion Korean won in 2015 (including nonfood items). Supermarkets accounted for 32% of total retail sales, SSM 24%, traditional markets 14%, and online stores 30% (Korea Insurance Research Institute, 2017, Table 2-2). Regarding food and grocery, 56% of the total supermarkets sales and 88% of the SSM sales were food and groceries products in 2016 (Ministry of Trade, Industry and Energy, 2017), which implies that supermarkets and SSM concentrate on food and grocery sales. Traditional market is generally considered as an important food retail market as well.

As aforementioned, the main purpose of the study is to examine the influence of household types on the selection of food and grocery stores. Little research has been done in examining the association between household types and food retailer choices in this line of research. Thus, the research question is whether there are differences in the selection of food and grocery stores across household types (one-person versus multi-person households, by age groups). Additional research question is what factors are associated with the choice of food and grocery stores, including consumers' demographic characteristics, store attributes, and consumer competence³.

The empirical findings show that household types are, indeed, important factors in explaining and predicting food and grocery store choices with other demographic characteristics. The findings of this study might contribute to develop food products and food retail store features to

³ Consumer competence is not defined clearly in the literature (Grønhoj, 2007). We define consumer competence in this paper as attitude toward food and grocery shopping, where competence is the ability to do something successfully or efficiently. A consumer with high competence means that the consumer uses, for example, food related information effectively when s/he goes to shop food and groceries in a store.

better serve diverse types of households and also help to describe the possible target population of food retail stores in the future. Food marketing researchers, professionals working in the food industry, and social workers working with elderly households will be benefited from the study.

2. Literature Review

2.1. Trends in Retail Food Markets and Consumer's Food Store Choice

Supermarkets, SSM, large discount stores, and traditional markets are the main food retail stores where consumers purchase food and groceries. Several studies have investigated to what extent food retail stores have changed (Burt and Sparks, 2003; Guy, Clarke, and Eyre, 2004; Kim et al., 2016; Muhammad, Sujak and Rahman, 2016; Reardon et al., 2003). Other studies examined food consumption and expenditures (Lee and Ahn, 2016; Tomic, Cerjak, and Rupcic, 2014). Recent studies have concentrated on consumer's choice between offline and online food stores with the development of internet shopping (Baek, 2009; Binkley, 2013; Binkley and Chen, 2016). These studies included consumers' socioeconomic characteristics and store characteristics to explain consumers' choices. Some other studies considered consumer characteristics like age, education, income, dietary pattern and lifestyle to examine food store choices focusing on online shopping (Lee, 2000; Lee and Kwak, 2015; Park et al., 2014).

Bai et al. (2008) investigated Chinese consumer behavior in choosing different retail food stores and how household demographics affect shopping behavior. A multivariate probit model with four categories of retail food stores such as wet markets, small grocery stores, supermarkets, and SSM in Quindao, China. The results indicate that store owners' characteristics, consumers' demographics, and shopping habits are related to the choice of the retail food stores. The results also show that store attributes such as quality, variety, and price of

goods in the store affect the selection of food and grocery stores. Lee (2006) and Ryu and Ryu (2001) also found that the price, quality and variety of goods in the stores are important factors to explain the store choice. Other store attributes, for example distance to a store, brand loyalty, freshness, taste and country of origin also significantly affect food retail store choices (Baek, 2009; Ha and Lee, 2017; Kim and Ju, 2007; Suh and Kim, 2009).

Regarding traditional markets, Jin and Shin (2013) examined housewives' shopping behavior in traditional markets using a survey data. A survey was completed with 671 homemakers, aged 30-50, who are main decision makers on the purchase of foods and other necessities in 2011. They found that region and age are leading variables to explain respondents' shopping behavior in traditional markets. Kim (2010) and Lee (2006) examined the main customer types who are using traditional markets and identified that elderly people and low-income families visit traditional markets often.

A series of previous works have investigated e-commerce and food and groceries (Baek, 2009; Hwang, 2013; Jin, 2017; Jung et al., 2006; Kim and Ju, 2007; Lee, 2000; Liang and Lim, 2011; Mintel, 2014; Park et al., 2014; Ryu and Ryu, 2001; Suh and Kim, 2009). Among others, Chu et al. (2010) examined the effects of households' shopping frequency and sensory nature of products on online and offline channels for grocery products including brand loyalty, size loyalty, and price sensitivity. Park et al. (2014) analyzed the trend of the e-commerce of agricultural products in Korea. The results indicate that there are three aspects of agricultural products consumption, 1) an increase of processed food, 2) an increase of food-away-from-home (eating out), and 3) growth of sales in the hypermarket (a very large store with a wide range of goods). Park et al. (2014) highlighted that food consumption patterns have not been considered in the studies of household food retail selection between offline and online even though the patterns are an influential factor on e-commerce.

Using the data from the 2016 CBSF, Park (2016) analyzed the consumer behavior on internet food shopping. The findings of the study suggested that region, cooking-at-home, dual-income, age, education, and occupation have significant influence on internet food purchases. Using

data from the 2017 CBSF⁴, Jin (2017) examined purchasing food through mobile and internet. Jin (2017) identified that age, education, region, and number of cars are important variables to explain and predict the probability of purchasing food online. Further, Jin (2017) found that lower educated, young and one-person households are more likely to use mobile food shopping compared to internet food shopping.

Little is known about consumer choice of convenience stores in the literature. However, the convenience store chains have released more home meal replacements, small pack products that can cater to such consumers, in view of the growing trend of one-person households. As a result, convenience stores are enjoying such substantial growth, while department stores and supermarkets are struggling due to sluggish domestic consumption (Jung, 2017). Ha and Lee (2017) found that convenience stores provide consumers more product options than large discount stores, department stores, supermarkets, and traditional markets. They suggested that product characteristics like freshness, taste, and quality of food affect consumers' choice of convenience stores.

2.2. One-Person Household, Aging Population, and Grocery Store Choice

Population and household structures will change. As pointed out in the previous section, one-person households will grow quickly. Statistics Korea, which carries out a comprehensive population and housing study every five years (Census), defines one-person households as households in which a single person makes a living, cooks, and sleeps alone. According to Statics Korea, the total number of households has increased by 51% since 1995 while the number of one-person households has increased by 217%. Essentially, one-person households are driving the increase in the number of total households. There are 5.2 million one-person households in Korea (27.2% of the total 19.6 million households in 2016) and one-person

⁴ 2017 KREI CBSF is not available for the public.

households are projected to grow to 6.7 million (32% of the total households) in 2025 and 8.1 million (36% of the total households) in 2045 (Statistics Korea, 2017). The elderly (age 65 and up) population is also projected to rise. In 2015, the number of elderly population was 6.5 million (13% of total population), which will grow to 10 million (20% of total population) in 2015 and more than 18 million in 2045 (36% of total population) (and start declining but the share of elderly people will continue to grow) (Statistics Korea, 2017a, 2017b). Households with heads aged 65 or over are projected to increase from 3.7 million (19% of population) in 2015 to 10.7 million (48% of population) in 2045 (Statistics Korea, 2017a, 2017b).

Lee and Kwak (2015) investigated one-person households' characteristics, expenditure structure, and consumption pattern in Korea with the survey on 1,000 one-person households. Lee and Kwak (2015) found that one-person households had struggled with consumer competence such as information search and product comparison when purchasing food items. Their major concern was food safety such as checking manufactured/expiration dates on products and sanitation. Most of one-person households encountered problems in food and parcel services, followed by food products. According to Lee and Kwak (2015), one-person households purchased food and grocery products in supermarkets (55.6%), SSM (25.6%), internet malls (8.0%), convenient stores (5.1%), traditional markets (4.8%), and department stores (0.9%).

The growth of one-person households are related with aging. The elderly one-person households in Korea consist of mostly female, educated under elementary school, and lower level of health and economic status (Kim and Cho, 2015). According to a consumption expenditure study, the elderly one-person household's food expenditure proposition was higher than any other age group (Sung, 2013). Park (2014) also examined the one-person household's food consumption behavior using data from the 2014 CBSF. The findings of this study indicated that 13.9% of the entire sample (N=3,344) were one-person households and the main food purchase stores among one-person households were supermarkets (38%), traditional markets (39%), and large discount stores (24%). Male and high school graduates used supermarkets more, while female, those older than 40 years old, lower educated people used

traditional food markets.

Statistics Korea's press release reveals that consumers' food store choices have changed rapidly due to the increase of one-person households and development of mobile shopping skills. Several previous studies also indicate age as a significant variable to influence food store choices in Korea. In addition, education, dietary life pattern, consumer's competence, and attributes of grocery stores were considered as important factors influencing consumers' grocery store selection. However, even though the importance of household composition has grown, few studies have focused whether household type, with a combination of household composition (one-person vs. multi-person) and age, could have an influence on food and grocery store choices.

3. Methods

3.1. Data

To examine household food and grocery store choices, we use data from the Consumer Behavior Survey for Food (CBSF). This survey has been conducted by the Korea Rural Economic Institute (KREI) yearly since 2013. The CBSF is a nationally representative sample of Korean households (Lee et al., 2015), and includes detailed information on household food consumption, consumer behavior, primary grocery store choice, eating-out behavior, satisfaction on food policies, and demographic characteristics. The CBSF, by design, has three focus groups: main meal planners at home, adults, and youth. The current study utilizes the 2016 CBSF, while focusing on the main meal planners at home and its associated data since it has information regarding one-person vs. multi-person households. All the raw data, survey questionnaires, survey procedures, and the list of KREI studies using the survey are available at <http://foodsurvey.krei.re.kr/>.

3.2. Sample

Table 1 presents socio-demographic characteristics of survey respondents and households. Total number of observations used in the study is 3,286 households. Among them, female respondents are 90.3% of the sample, implying that females are the majority of main meal planners at home. Occupation of the respondents also tells that the main meal planner is a homemaker (42.1%) and 26.1% of respondents are working in sales and service industries. Many respondents had completed high school education (44.1%) and the average monthly income is 3.86 million won (approximately \$3,509); however, 43.4% of the respondents' monthly household income is less than 3 million won. It also shows that approximately 42% of the sample respondents reside in urban areas.

Table 1. Socio-Demographic Characteristics of the Sample (N=3,286)

		Frequency	Percent
Gender	Male	319	9.7%
	Female	2,967	90.3%
Age	Less than 25 years old	39	1.2%
	25 - 34 years old	310	9.4%
	35 - 44 years old	697	21.2%
	45 - 54 years old	955	29.1%
	55 - 64 years old	753	22.9%
	65 years old and up	532	16.2%
Occupation	Office / administration	460	14.0%
	Sales / service	860	26.1%
	Agro-industries	231	7.0%
	Skilled/unskilled labor	214	6.5%
	Homemaker	1,384	42.1%
	Student	19	0.6%
	Others	122	3.7%
Education	No formal educational credential	171	5.2%
	Completed middle school	650	19.8%
	High school diploma	1,449	44.1%
	College degree and up	1,016	30.9%

(Continued)

		Frequency	Percent	
Monthly household income	Less than 1 million won	340	10.3%	
	1-2 million won	476	14.5%	
	2-3 million won	612	18.6%	
	3-4 million won	717	21.8%	
	4-5 million won	553	16.8%	
	5-6 million won	385	11.7%	
	6 million won and up	203	6.2%	
Residence	Seoul/Incheon	540	16.4%	
	Other urban areas	838	25.5%	
	Rural areas - central region	1,048	31.9%	
	Rural areas - southern region	860	26.2%	
Household Type	One-person	Age less than 25	29	0.9%
		Age 25 - 34	81	2.5%
		Age 35 - 44	57	1.7%
		Age 45 - 54	101	3.1%
		Age 55 - 64	120	3.7%
		Age 65 and up	200	6.1%
	Sub-total		588	17.9%
	Multi-person	Age less than 25	10	0.3%
		Age 25 - 34	229	7.0%
		Age 35 - 44	640	19.5%
		Age 45 - 54	854	26.0%
		Age 55 - 64	633	19.3%
Age 65 and up		332	10.1%	
Sub-total		2,698	82.1%	

In the analyses, to create household type variable, respondents (households) are divided into twelve different groups based on household structure (one-person vs. multi-person) and age of the respondent. First, a household is classified as either a one-person or a multi-person household. The percentage of one-person households in the 2016 CBSF is 17.9% (Statistics Korea (2016) estimates that the share of one-person households in 2016 was 27%). Second, respondents (households) are further divided based on six age categories following the U.S. Census age categories as shown in household classification rows in Table 1 such as age less than 25, 25-34, 35-44, 45-54, 55-64, and 65 and up. Elderly person household is a household

where the survey respondent's age is 65 years or older. The percentage of elderly person households in the 2016 CBSF is 16.2% (Statistics Korea (2016) estimates the share of elderly person households in 2016 was 19.8%).

3.3. Model

Consumers' grocery store choices among supermarkets, super-super markets (SSM), large discount stores, traditional markets, and other types of markets (definitions of grocery stores and markets follow in the next section) are unordered and thus the multinomial logit model is constructed based on a random utility model, which is given by

$$(1) \quad \Pr(y_i = j) = \frac{e^{\beta'z_{ij}}}{\sum_{j=1}^J e^{\beta'z_{ij}}}$$

where j is a subscript to denote choices of grocery stores, i.e., $j \in \{\text{supermarkets, super-super markets, large discount stores, traditional market, other markets}\}$, i is a subscript to indicate individual (respondent), i.e., $i1, \dots, 3,286$, and $\mathbf{z}_{ij} = [\mathbf{x}_{ij}, \mathbf{w}_i]$ is a vector of explanatory variables in the model where \mathbf{x}_{ij} contains variables varying across the choices and across the consumers (attributes) such as: distance to the store, and quality of the grocery in the store. \mathbf{w}_i contains the characteristics of the individuals and is, therefore, the same for all choices such as: respondents' household types, education, income, residence, and so on.

3.4. Statistical Analyses

Descriptive statistics for all of the variables in the multivariate analyses are provided in Table 2. A multinomial logit regression is used to determine the effect of household type on grocery store choices and to identify which, if any, of the independent variables explains grocery store

choices. A multinomial logit model is appropriate when data related to outcomes are individually specific (Greene, 2000). In this model, the dependent variable is respondents' grocery store choices.

Dependent variable. The main objective of this study is to examine whether there exist differences in selection of primary food and grocery stores across household types. To accomplish this objective, this study employs survey results available from the 2016 CBSF, asking "what is the primary food and grocery store you are using?" There are nine possible food and grocery store choices available for the responses in the survey. To this question, responses are classified into five types of grocery stores choices. The five grocery store choice variables are: 1) supermarkets which include small-medium sized supermarkets (mini shop) operated by small retailers; 2) super-super markets (SSM) which are chain stores operated by larger retailers such as Home-plus Express, Lotte Super, and E-Mart Everyday; 3) large discount stores are the large chain stores operated by larger retailers such as E-Mart, Hanaro Club, and Home-plus; 4) conventional or traditional markets which represent "Jae Rae Si Jang"; and 4) other grocery stores that include department stores, cooperation, online or mail order, home shopping (TV channels), or convenience stores. In the estimation of equation (1), traditional market is set to be a reference choice.

Independent variables. The focus of this study is to examine the effect of household type (one-person and multi-person by age categories) on grocery store choices; thus, the household type is a main independent variable in the study. Twelve dummy variables (one-person and multi-person household and six age categories) are created using survey respondents' age and household structure. As shown in Table 1, these twelve dummy variables represent one-person age less than 25, one-person age 25-34, one-person age 35-44, one-person age 45-54, one-person age 55-64, one-person age 65 up, multi-person age less than 25, multi-person age 25-34, multi-person age 35-44, multi-person age 45-54, multi-person age 55-64, multi-person age 65 up, and multi-person age 45-54 is set to be a reference group in the model. We also include respondents' socio-economic characteristics such as household monthly income,

occupation, gender, education, and residential area. Household income and education are included as continuous variables. Residence is included as a 0-1 dummy variable (1 if urban residents, 0 if otherwise) in the empirical model. Table 1 presents socio-demographic characteristics of the sample households, including gender, occupation, education, household income, and residential area.

Table 2 shows the other set of independent variables and their descriptions of grocery store choices for the sample. In the empirical model, household eating preferences such as cooking at home, food-away-from-home (eating out), and take-out/delivery variables are included as 0-1 dummy variables. Household eating preferences variables are constructed as follows: in the 2016 CBSF, there are three choices for the question, “are you cooking at home?” Three choices are a) cook most of food at home, b) cook some at home and purchase precooked food, and c) do not cook at home. The variable cook-at-home takes 1 if a respondent answered a), otherwise it takes 0. Food-away-home question has two choices, a) eat out and b) do not eat out. The variable food-away-home takes 1 if a respondent selected a) or 0 if the respondent selected b). Take-out/delivery question has four choices in the 2016 CBSF, a) use both take-out and delivery, b) use only delivery, c) use only take-out, and d) do not use delivery nor take-out. When a respondent chose a), b) or c), the take-out/delivery variable takes 1.

The grocery frequency is also included as a continuous variable. The grocery frequency variable takes value of 7 if a respondent goes to a grocery store every day, 3 for 2-3 times per week, 1 for once a week, 0.5 for every other week, 0.25 for once a month, and 0.1 for fewer than once a month. As shown in Table 2, 44.3% of respondents go to the grocery stores once a week and 36.9% 2-3 times per week. The reasons to choose a grocery store (i.e., attributes of grocery stores) are included as five dummy variables: 1) quality of goods at the store, 2) price level of goods at the store, 3) distance to the store, 4) variety of goods at the store, and 5) others including delivery option, hospitality of the store (reference group). These five variables were constructed based on the question and responses in 2016 CBSF, “What is the reason for you to choose this grocery store as your primary grocery place?”

Table 2. Variable Description and Descriptive Statistics of Consumer Characteristics and Preferences (N=3,286)

Variables	Description	Responses	Percent
Cook at home	Whether respondents cook at home	Yes - 2,954	89.9%
		No - 332	10.1%
Food-away-from-home	Whether respondents go out to eat	Yes - 2,623	79.8%
		No - 663	20.2%
Take out/delivery	Whether respondents use take-out or delivery food	Yes - 2,207	67.2%
		No - 1,079	32.8%
		Everyday - 59	1.8%
		2-3 per week - 1,212	36.9%
Grocery frequency	Frequency of grocery shopping	Once a week - 1,456	44.3%
		Every other week - 449	13.7%
		Once a month - 88	2.7%
		Fewer than above - 22	0.7%
Quality of goods	Reason for respondents to choose the grocery store is quality of grocery at the store	635	19.3%
Price level	Reason for respondents to choose the grocery store is price level of grocery at the store	643	19.6%
Distance to store	Reason for respondents to choose the grocery store is distance to store	1,293	39.4%
Variety of goods	Reason for respondents to choose the grocery store is variety of grocery and other goods at the store	622	18.9%
Others/delivery	Reason for respondents to choose the grocery store is delivery option, service of the store and others	93	2.8%
Purchasing competence	Capability to use information such as food labels, nutrition facts	Average - 3.48 Std. Dev. - 0.46	
Eating/diet competence	Capability to organize what to eat regarding diet choice	Average - 3.63 Std. Dev. - 0.41	

(Continued)

Variables	Description	Responses	Percent
Civic	Ability and willingness to engage in	Average - 3.60	
competence	active participation in all the contexts of food consumption	Std. Dev. - 0.40	

The 2016 CBSF collects information regarding consumers’ attitude toward grocery shopping, eating/diet, food labeling and regulations, and government food policies that might affect their choice of the grocery store. Using the various questions in the 2016 CBSF we create so-called “competence” variables, where competence means the ability to do something successfully or efficiently. Grocery-purchasing competence is about the capability to use, coordinate or organize information about food and groceries such as food labels, nutrition facts, country of origin, and related information. There are total of 18 questions regarding grocery-purchasing competence (see Appendix for more about these variables and actual questions in the survey in use). Respondents are asked whether they agree or disagree with a statement in the survey and each option is given a score (Likert-type scale) between 1 (extremely no) and 5 (absolutely yes). For instance, one of the questions is whether a respondent uses food labeling to get more information about food and groceries. If the respondent says absolutely yes, it is coded 5. We average all the responses to create an index for the grocery-purchasing competence. Eating/diet competence is about the attitude towards eating and diet choice, consideration of nutrition, food safety, and pursuing healthy life. There are another set of 18 questions asked in the survey (see appendix for actual questions in the survey) and we average all the responses to create an index. Lastly, civic competence is the ability and willingness to engage in active participation in all the contexts of food consumption, consumers’ rights and government food policies. In total, 20 questions related to civic competence are asked and the responses are averaged (see appendix for actual questions in the survey).

4. Results

4.1. Descriptive Results

Table 3 presents information on the primary food and grocery store choice of sample households and compares by household type. The household type includes six age groups of one-person households (one-person age less than 25, one-person age 25-34, one-person age 35-44, one-person age 45-54, one-person age 55-64, and one-person age 65 and up) and six age groups of multi-person households (multi-person age less than 25, multi-person age 25-34, multi-person age 35-44, multi-person age 45-54, multi-person age 55-64, and multi-person age 65 and up).

There are, indeed, differences in the selection of primary food and grocery stores across household types. A relatively higher portion (42%-52.5%) of one-person age 25-34, 35-44, and 45-54 households use supermarkets as their primary food and grocery stores, and the next highest portion of the one-person 25-34, 35-44, and 45-54 households use large discount stores (24.8-37.0%). These household types rarely use SSM (6.9%-12.4%) or traditional markets (3.7-14.9%). While a relatively higher proportion (39.2%) of the one-person age 55-64 households select supermarkets, 31.7% of the households select traditional markets as their primary grocery stores. A relatively higher portion (58.0%) of one-person age 65 and up households use traditional markets as their primary food and grocery stores. Other than traditional markets, one-person age 65 and up households select supermarkets (29.0%) as well. Other types of grocery markets (e.g., department stores, home shopping or convenience stores) are mostly to be used by one-person age less than 25 (17.2%) and 25-34 households (4.9%) but the number of households who select other markets is very few. Overall, relatively young one-person households use supermarkets and large discount stores and relatively old one-person households are more likely to use supermarkets and traditional markets as their primary food and grocery stores.

Table 3. Selection of Grocery Stores by Household Type (N=3,286)

Household Type		Grocery Store Choices					Total
		Super-market ¹	Super-Super Market ²	Large Discount Store ³	Traditional Market	Other Market ⁴	
One-person	Age < 25	9 (31.0%)	2 (6.9%)	12 (41.4%)	1 (3.5%)	5 (17.2%)	29 (100%)
	Age 25-34	34 (42.0%)	10 (12.4%)	30 (37.0%)	3 (3.7%)	4 (4.9%)	81 (100%)
	Age 35-44	25 (43.9%)	7 (12.3%)	18 (31.6%)	5 (8.8%)	2 (3.5%)	57 (100%)
	Age 45-54	53 (52.5%)	7 (6.9%)	25 (24.8%)	15 (14.9%)	1 (1.0%)	101 (100%)
	Age 55-64	47 (39.2%)	11 (9.2%)	23 (19.2%)	38 (31.7%)	1 (0.8%)	120 (100%)
	Age 65 up	58 (29.0%)	5 (2.5%)	21 (10.5%)	116 (58.0%)	0 (0.0%)	200 (100%)
	Sub-total	226 (38.4%)	42 (7.1%)	129 (21.9%)	178 (30.3%)	13 (2.2%)	588 (100%)
Multi-person	Age < 25	2 (20.0%)	2 (20.0%)	5 (50.0%)	1 (10.0%)	0 (0%)	10 (100%)
	Age 25-34	56 (24.5%)	15 (6.6%)	136 (59.4%)	15 (6.6%)	7 (3.1%)	229 (100%)
	Age 35-44	156 (24.4%)	67 (10.5%)	353 (55.2%)	60 (9.4%)	4 (0.6%)	640 (100%)
	Age 45-54	218 (25.5%)	90 (10.5%)	347 (40.6%)	187 (21.9%)	12 (1.4%)	854 (100%)
	Age 55-64	216 (34.1%)	55 (8.7%)	162 (25.6%)	198 (31.3%)	2 (0.3%)	633 (100%)
	Age 65 up	94 (28.3%)	12 (3.6%)	46 (13.9%)	179 (53.9%)	1 (0.3%)	332 (100%)
	Sub-total	742 (27.5%)	241 (8.9%)	1,049 (38.9%)	640 (23.7%)	26 (1.0%)	2,698 (100%)
Total		968 (29.5%)	283 (8.6%)	1,178 (35.9%)	818 (24.9%)	39 (1.2%)	3,286 (100%)

1 Supermarket represents a small to medium size food and grocery store.

2 Super-Super market (SSM) represents a food and grocery store which is a chain store operated by relatively larger retailers such as Home-plus express, Lotte Super, and E-mart Everyday.

3 Large discount store represents a food and grocery store which is operated by large retailers such as E-mart, Home-plus, Lotte Mart.

4 Other market includes department stores (food section), cooperation, online/mail order, and convenience stores.

Table 3 also shows information on how multi-person households select different stores as their primary food and grocery stores. It shows that relatively young (less than 25, 25-34, 35-44, and 45-54) multi-person households select SSM as their primary food and grocery stores. The multi-person age 55-64 households use supermarkets (34.1%) as well as traditional markets (31.3%) as their primary food and grocery stores. Similar to the one-person age 65 and up households, a relatively higher portion (53.9%) of the multi-person age 65 and up households frequently use traditional markets, suggesting that elderly groups, including one-person and multi-person elderly, use traditional markets rather than SSM or large discount stores. Overall, relative young multi-person households select large discount stores as their primary food and grocery stores and elderly multi-person households shop their food and groceries in traditional markets.

4.2. Multinomial Logistic Regression Results

We attempt to examine the effect of household type on food and grocery store choices using the multinomial logistic regression analyses. Table 4 presents the estimates of the logistic model with traditional markets as the base outcome, thus we can assess the significant differences between supermarkets (Super), super supermarkets (SSM), large discount stores (LDS), and other markets (OTH) compared to traditional markets. Since the parameter estimates are relative to the reference group (traditional markets), the standard interpretation of the coefficient is that, for a unit change in the predictor variable, the logit of choosing the grocery store relative to the reference group is expected to change by its respective parameter estimate given the variables in the model are held constant.

Table 4. Multinomial Logistic Regression Results for Grocery Store Choices (N=3,286)

	Super-market (Super) (n=968)	Super-Super Market (SSM) (n=283)	Large Discount Store (LDS) (n=1,178)	Other Market (OTH) (n=39)
	Coeff.	Coeff.	Coeff.	Coeff.
<i>Household Types:</i>				
One-person age < 25	2.2310 **	2.0093	2.2931 **	4.7240 ***
One-person age 25-34	2.1074 ***	2.1739 ***	1.8262 ***	3.3686 ***
One-person age 35-44	1.6257 ***	1.4836 **	0.9402 *	2.3682 **
One-person age 45-54	1.2787 ***	0.5935	0.3677	0.7174
One-person age 55-64	0.6483 **	0.7407 *	-0.0669	0.3623
One-person age 65 and up	-0.0238	-0.6518 ***	-0.8364 **	-13.614
Multi-person age < 25	0.5011	2.0006	1.2812	-13.690
Multi-person age 25-34	1.0007 ***	0.6113	1.4795 ***	1.8953 ***
Multi-person age 35-44	0.7358 ***	0.7788 ***	1.0628 ***	0.0056
Multi-person age 55-64	0.2635	0.0942	-0.2782 *	-1.3338 *
Multi-person age 65 and up	-0.6220	-0.4597	-0.7712 ***	-0.9750
(Multi-person age 45-54)				
<i>Household and Consumer Characteristics:</i>				
Gender:				
Female	0.1171	0.6179 **	0.3859 *	-0.2891
(Male)				
Household income	0.0448	0.2687 ***	0.2134 ***	0.2781 **
Education level	0.2565 ***	0.4073 ***	0.4618 ***	0.3370
Occupation	0.0229	0.0467	0.0044	0.2283 **
Residents:				
Urban	-0.1646	0.2934 *	-0.2433 **	-0.0591
(Rural)				
Grocery frequency	-0.0124	-0.1185 *	-0.2122 ***	0.0227
Consumer competence:				
Purchasing competence	0.3254 **	0.7292 ***	0.2624	1.0314 *
Diet competence	-0.1022	-0.7144 **	-0.1453	-1.4460 **
Civic competence	-0.2900	0.0346	-0.1155	-0.0561
Cook at home	-0.1964	-0.5229 **	-0.0753	-0.3738
Food away from home	0.1792	0.1198	0.1974	1.2979
Take-out/delivery	0.2810 **	0.0479	0.2729 *	-0.0916

(Continued)

	Super– market (Super) (n=968) Coeff.	Super–Super Market (SSM) (n=283) Coeff.	Large Discount Store (LDS) (n=1,178) Coeff.	Other Market (OTH) (n=39) Coeff.
<i>Attribute of Grocery Stores:</i>				
Quality	-1.0289 ***	-0.8070 *	-0.7691 **	-1.2731 *
Price	-1.7142 ***	-1.6124 ***	-1.5582 ***	-3.4288 ***
Distance	-0.0289	-0.2294	-1.1152 ***	-1.9809 **
Variety	-1.3454 ***	0.0313	0.8928 **	-0.2095
(Other reason)				
Constant	-0.1977	-3.2449 ***	-1.3391 *	-3.2009
LR $\chi^2(108)$			1675.92	
Prob > chi2			0.000	
Pseudo R ²			0.1906	

Standard errors are not reported to save space.

*p < .10; **p < .05; ***p < .01

Note: Reference categories are presented in parentheses. Traditional market choice is a base outcome (n=818).

Table 4 shows that all else being equal, most of coefficients associated with household type are statistically significant in predicting food and grocery store choices (note that multi-person age 45-54 as the reference household type). Unfortunately, the coefficients from multinomial logit are difficult to interpret because they are relative to the base outcome (traditional markets) and that would be misleading (Greene, 2000, page 861). Another way to evaluate the effect of variables is to examine the marginal effect of changing their values on the probability of observing choice of grocery stores. The marginal effect of the variable on the probability of choosing the grocery stores is

$$(2) \quad \delta_j = \frac{\partial P_j}{\partial z_i} = P_j \left[\beta_j - \sum_{k=1}^J P_k \beta_k \right] = P_j [\beta_j - \bar{\beta}]$$

where $P_j = \Pr(y = j)$, z_i is an independent variable, and $j = \{\text{supermarkets, SSM, large discount stores, traditional markets, others}\}$. These values can be computed from the parameter estimates in Table 4. Table 5 presents the marginal effects of all the explanatory variables at the mean. Note that for any particular z_k , $\partial P_j / \partial z_k$ need not have the same sign as β_{jk} (Greene, 2000, page 861).

Table 5. Marginal Effects of Multinomial Logit Model in Selecting Grocery Stores (N=3,286)

	Super- Market (Super)	Super- Super Market (SSM)	Large Discount Store (LDS)	Traditional Market (TRD)	Other Market (OTH)
<i>Household Type:</i>					
One-person age < 25	0.1543	0.0264	0.2036	-0.3926 **	0.0083
One-person age 25-34	0.1769	0.0611	0.1051	-0.3482 ***	0.0051
One-person age 35-44	0.1954 *	0.0468	-0.0204	-0.2256 **	0.0038
One-person age 45-54	0.2138 ***	0.0003	-0.0809	-0.1336 **	0.0004
One-person age 55-64	0.1239 **	0.0472	-0.1151 *	-0.0564	0.0003
One-person age 65 and up	0.1206	-0.0230	-0.1545	0.0934	-0.0365
Multi-person age < 25	-0.0856	0.1176	0.1838	-0.1759	-0.0400
Multi-person age 25-34	0.0271	-0.0290	0.2061 **	-0.2069 ***	0.0027
Multi-person age 35-44	0.0141	0.0085	0.1356 ***	-0.1563 ***	-0.0019
Multi-person age 55-64	0.0862	0.0104	-0.0962	0.0032	-0.0036
Multi-person age 65 and up	0.0885 **	-0.0108	-0.1545 **	0.0786 **	-0.0017
(Multi-person age 45-54)					
<i>Household and Consumer Characteristics:</i>					
Gender:					
Female (male)	-0.0368	0.0368 *	0.0548	-0.0533	-0.0015
Household income	-0.0228 ***	0.0145 **	0.0347 **	-0.0268 ***	0.0004
Education level	-0.0097	0.0115	0.0633 ***	-0.0652 ***	0.0014
Occupation	0.0028	0.0032	-0.0034	-0.0031	0.0006
Residents					
Urban (Rural)	-0.0164	0.0389 ***	-0.0479 **	0.0253	0.0001
Grocery frequency	0.0249 **	-0.0025	-0.0436 ***	0.0209 **	0.0003
Consumer capability:					

(Continued)

	Super– Market (Super)	Super– Super Market (SSM)	Large Discount Store (LDS)	Traditional Market (TRD)	Other Market (OTH)
Purchasing competence	0.0173	0.0442 *	-0.0026	-0.0610 **	0.0021
Diet competence	0.0171	-0.0535	0.0044	0.0356	-0.0036
Civic competence	-0.0500	0.0157	0.0049	0.0292	0.0002
Cook at home	-0.0176	-0.0368 *	0.0235	0.0316	-0.0006
Food away from home	0.0113	-0.0022	0.0120	-0.0323	0.0032
Take-out/delivery	0.0279	-0.0137	0.0298	-0.0432 *	-0.0008
<i>Attribute of Grocery Stores:</i>					
Quality	-0.1081	-0.0121	-0.0322	0.1541 ***	-0.0016
Price	-0.1397	-0.0334	-0.1071	0.2862 ***	-0.0060
Distance	0.1285 *	0.0205	-0.2449 *	0.1002	-0.0043
Variety	-0.3897 ***	0.0117	0.3580 ***	0.0204	-0.0003
(Other reason)					

Standard errors are not reported to save space.

*p < .10; **p < .05; ***p < .01

All the marginal effects for one-person households are positive and marginal effects for age 35-44, 45-54 and 55-64 are statistically significant, suggesting that one-person households prefer to use supermarkets as their primary food and grocery store. All of marginal effects on SSM and large discount stores are not statistically significant, except the marginal effect of large discount store for one-person 55-64 which is negative. Most of marginal effects on traditional markets are negative and statistically significant. In short, one-person households, regardless of age categories, are more likely to go to supermarkets to shop food and groceries and do not use traditional markets. Relatively young (< 25, 25-34, and 35-44) multi-person households prefer to use large discount stores as their primary food and grocery place. Interestingly, both multi-person households age 55-64 and 65 and up select supermarkets and traditional markets as their primary food and grocery stores, but do not select SSM.

Household characteristics such as household income, education level, and residential area are examined for their impact on food and grocery store choices. Household income level is

statistically significant and positive for SSM and large discount stores, but it is negative for supermarkets and traditional markets. The findings suggest that as the levels of income increased, the likelihood of households to use SSM and large discount stores increased and the likelihood to use supermarkets and traditional markets decreased. Similar results are found for education level, suggesting that all else being equal, as the level of education increased, households are more likely to shop for their groceries in SSM (not statistically significant, though) and large discount stores, but they are less likely to shop for their groceries in supermarkets (not statistically significant) and traditional markets. In contrast, those living in urban areas are more likely to use SSM and less likely to shop in large discount stores as compared to rural residents.

As the frequency of visiting food and grocery stores increased, households are more likely to use supermarkets, but they are likely to use SSM (not statistically significant) and large discount stores. Marginal effects of consumer competence indices are not statistically significant, except purchasing competence for SSM and the traditional markets, which is anti-intuitive. As the level of index related to purchasing competence increased, the likelihood of choosing SSM increased, but the likelihood of using traditional markets decreased, perhaps because groceries from traditional markets do not provide enough food related information.

In this study, five dummy categorical store attributes (e.g., quality, price, variety, distance, other attribute [reference group]) are included to measure consumers' reason to choose that store. Marginal effects in Table 5 indicate that as compared to other attributes, the coefficients associated with both quality of goods and price of goods in that store are statistically significant and positive for choosing traditional markets. The findings suggest that, if quality of goods and price of goods are important attributes to choose that store, households are more likely to go to traditional markets than supermarkets, SSM or large discount stores (note that marginal effects are negative, but not statistically significant). The distance attribute is statistically significant and negative for choosing SSM, suggesting that if households consider distance to the store, they are less likely to use large discount stores but choose supermarkets instead. The variety of

goods at the store is statistically significant and negative in choosing supermarkets, but is significant and positive in selecting large discount stores. These findings suggest that when the households are concerned about variety of goods at the store, they are more likely to shop their food and groceries in large discount stores, but they are less likely to go to supermarkets. Other consumer characteristics, such as whether they prefer to cook at home, to go out to eat, or to take-out food, do not play an important role in selecting food and grocery stores. If households cook most of food at home, they are less likely to use SSM as the primary grocery store. If households prefer to use take-out food or delivery food, they are less likely to visit traditional markets.

5. Discussion and Implications

This study examines the factors associated with selecting food and grocery stores among Korean households, while focusing on the effect of household type on food and grocery store choices. As other factors, we examine the effects of consumer competency factors, grocery store attributes, and household socio-demographics on food and grocery store choices. The resulting profile from this study suggests that there are significant differences in food and grocery store choices by different household types. One-person households, regardless of age categories, are more likely to choose supermarkets as their primary grocery stores, but they are less likely to select traditional markets (note that all of marginal effects are positive but some of them are not statistically significant, see Table 5). It is reasonable partly because one-person households purchase smaller packaged food items or pre-cooked food items.

Relatively young (age less than 45) multi-person households, however, are more likely to shop for groceries in large discount stores and less likely to choose traditional markets. It is partly because these households consist of many family members including their children, thus

they could prefer to purchase bulk food with lower prices. Multi-person age 55-64 and 65 and up households, however, are more likely to go to supermarkets and traditional markets. Multi-person age 55-64 and 65 and up households are less likely to go to large discount stores; it is partly due to changes in family members, for example, their children leaving home for college, job or marriage. Interestingly, elderly households (age 65 and up) select both supermarkets and traditional markets as their primary place for shopping food and groceries, and the magnitude (marginal effect) for supermarket is slightly larger (Table 5). It is noteworthy that all of marginal effects for SSM are not statistically significant, which is anti-intuitive. Many households do not choose SSM as their primary food and grocery stores (Table 3 and Table 5).

Other factors such as socio-demographics of the households that have impacts on the choice of grocery stores should be noted. One important variable is household income. Households with higher income tend to choose SSM and large discount stores, but not to choose supermarkets and traditional markets. Education of the respondent is another important variable to predict the food and grocery store choices. Respondents with higher education tend to choose large discount stores. Urban residents do not prefer to go to large discount stores, but they prefer to shop in SSM, implying that it is partly due to that urban residents are relatively young with smaller family size and they also shop groceries frequently. Consumer competence indices are not statistically significant except purchasing competence. If households believe food labeling, country of origin, nutrition facts, and other related information as important factors (i.e., higher purchasing competence), the likelihood of choosing traditional markets decreased. We believe that it is perhaps because groceries from traditional markets do not provide enough food related information. Regarding grocery stores attributes, both quality and price of goods in the stores are important to choose traditional markets. Large discount stores are not preferred if households consider distance as important attribute of the store. If a reason to select the store is variety of goods, they are more likely to choose large discount stores, but less likely to choose supermarkets.

This study attempts to examine how household types (one-person versus multi-person households by age groups), demographics, consumer competence, and grocery store attributes affect their food and grocery store choices. The results of this study are of particular interest for several reasons. First, the atmosphere or market environment where households purchase their food and groceries is changing. As shown in Table 5, one-person households prefer supermarkets, whereas relatively young multi-person households prefer large discount stores. Most of the households in this study do not prefer to shop their food and groceries in traditional markets. Only elderly multi-person households choose traditional markets as the primary grocery stores, implying that traditional markets might struggle with attracting consumers to their stores in the near future. Traditional markets play a diverse function and social role as a center of the local economy and life (Yim and Kim, 2017). It is, therefore, necessary to propose an effective development plan for stimulating traditional markets and attracting customers; however, it is beyond the scope of this research paper and this topic needs further investigation by future studies. Nonetheless, based on the results in Table 5, we may have some suggestions for traditional markets to attract more customers to their stores, such as marketing high quality of goods and low price of goods. In addition, it would be important for traditional markets to provide comprehensive food labeling information, including nutritional facts, country of origin, etc.

Second, one-person households are growing in Korea. The findings of this study suggest that one-person households, regardless of age categories, are more likely to use supermarkets as their primary food and grocery stores, and they are less likely to shop in traditional markets. Considering the growing trend of one-person households and competition of attracting customers with SSM and large discount stores, it is crucial for businesses and retailers to continue developing diverse food products in the supermarkets and design food retail stores that can meet needs for the one-person households' different age groups. In this way, Korean society prepares for the rapid growth of one-person households and its impact on food retail markets and grocery choices.

Third, as the population ages, elderly households will be more abundant in next two or three decades. This growth in older households requires some development of a marketplace tailored to elderly households. As shown in Table 5, supermarkets could be the primary choice of elderly households as household age 45-54 and 55-64 will become elderly in next two decades. The findings of this study imply that understanding elderly households' preferences on food and grocery store choices will be crucial. Thus, whether a food and grocery store is easily accessible to this age group and what types of food and groceries will be needed for this age group should be further investigated in future studies.

Finally, most of the current elderly one-person households in Korea are female, educated under elementary school, and those with low-level health and economic status (Lee et al., 2013). The elderly one-person households' food expenditure composition is higher than any other age groups according to a consumption expenditure study (Sung, 2013). We expect the growth of one-person households, aging population, and technology advance in marketplace in next two decades. Thus, it is crucial for businesses, marketers, community developers, researchers, and policy makers to have collaborative efforts to assist some one-person households in vulnerable circumstances, while developing a variety of food choices, food and grocery stores, or convenience retail stores.

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Appendix. Consumer Competence

The 2016 CBSF collects information regarding consumers' attitude toward grocery shopping, eating/diet, food labeling and regulations, and government food policies that might affect their choice of the grocery store. Using the various questions in the 2016 CBSF we create competence variables, where competence means the ability to do something successfully or efficiently. Respondents are asked whether they agree or disagree with a statement below and each option is given a score (Likert-type scale) between 1 (extremely no) and 5 (absolutely yes). We average all the responses to create three indices such as i) purchasing competence, ii) diet competence, and iii) civic competence. Detailed descriptions of the statements are presented here.

Purchasing competence (Questions I1-1 in the survey)

Use of labels

- (1) Quality of food depends on the source of origin.
- (2) I check the source of origin when purchasing food.
- (3) GAP, HACCP certification are helpful to purchase safe food.
- (4) GAP, HACCP certified food has a priority.
- (5) Information about producer, location, contents, and grades on the package or sales desk are important to select food.
- (6) I check information on package or sales desk when purchasing food.
- (7) Nutrition facts are important when purchasing food.
- (8) I check nutrition facts when purchasing food.

Use of food information

- (1) I know how to search the information when purchasing food.
- (2) I compare information about location, price, and quality of food.
- (3) It is necessary to obtain the objective and accurate information about food.
- (4) I utilize the objective and accurate information for healthy food consumption.
- (5) Information from the government or public organizations is helpful to improve daily diet.
- (6) I utilize information about purchasing food and diet very often.

Environment of purchasing food

- (1) Distance to a grocery store and consumer's physical condition influence food procurement.
- (2) There is no issue to purchase food and cook food with nearby grocery stores.
- (3) Government's support is required for vulnerable class to maintain healthy

diet.

- (4) All my family members can afford to purchase enough and various food.

Diet competence (Question II-2)

Healthy diet

- (1) Breakfast makes me avoid overeating and helps me to be healthy.
- (2) I have breakfast regularly.
- (3) It is important to have a meal with the family members.
- (4) I have a meal with my (all or some of) family members at least once a day.
- (5) Portion (amount of food to eat) control is important for healthy life.
- (6) I eat proper amount of food.
- (7) I make an effort to eat five basic food groups; protein, calcium, minerals and vitamins, carbohydrate, and fat.
- (8) I eat various food for having proper nutritional contents.
- (9) I know vegetables, fruits and whole grain which are good for health.
- (10) I usually eat vegetables, fruits, and whole grain.

Safe diet

- (1) I know hazard factors in production, distribution, and consumption of food.
- (2) Food safety is more important than price or taste of food.
- (3) I know how to keep and cook food safely.
- (4) I do not eat food which might have safety issues.

Traditional diet

- (1) It is necessary to succeed and improve traditional diet.
- (2) I usually make *Kimchi* and *Jang* or plan to learn how to make them.
- (3) Korean diet is good for health.
- (4) I make an effort to eat Korean food with *Bap* (rice).

Civic competence (Question II-3)

Consumer right

- (1) Food is directly related to consumer's health; thus consumer right should be strengthened.
- (2) I intend to be a member of consumer groups or organizations, or support them to improve food safety.
- (3) We should purchase more food from producers and manufacturers who have responsibility to society.
- (4) I intend to attend a boycott movement when a producer or a food manufacturer causes any problems to society.
- (5) Diet education improves the wrong diet habits.
- (6) I intend to have a diet education to improve my diet.
- (7) Various promotion and campaigns by government, food manufacturers, and consumer organizations should be run for improving diet.

- (8) I will attend the campaigns on which government is working such as “Eat Breakfast”, “Family Meal Day”, “Caring Kitchen Garden”, “Eat Fruits and Vegetables”, “Reducing Food Waste”, “Eat Low-fat Meat”.

Consumer responsibility

- (1) Reducing food waste is helpful for the environment and a decrease in waste of resources.
- (2) I do not make leftovers in a restaurant or home.
- (3) Local products are good in taste and for health.
- (4) I purchase local products regardless of price.
- (5) Consuming eco-friendly products is good for health and the environment.
- (6) I purchase eco-friendly products regardless of price.
- (7) Dining etiquettes should be maintained despite the increase of the number of nuclear households and frequent eating-away-from-home.
- (8) My family makes an effort to keep dining etiquettes.

Solving problems

- (1) Consulting programs are required from government, food manufacturers, and consumer organizations to improve diet and food purchase.
- (2) I will consult government, food manufacturers, or consumer organizations about the issues in diet and food purchase.
- (3) I know the procedures for claiming compensation for food contamination, poisoning and any food related damages.
- (4) I will go through the procedures to claim compensation for food contamination, poisoning and any food related damages.