Wageningen University - Department of Social Sciences

MSc Thesis: Development Economics

Determinants of People's Preference to Consume Food Out of Home

The Case of Northern Vietnam

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Abstract

Food consumption patterns have changed around the world, due to demand and supply effects. Demand effects include population and economic growth, changes in income distribution, and effects of urbanisation and globalisation on the food system. Supply effects – shifts in agricultural practices – led to falling food prices. Changing food consumption patterns caused an increase in the food consumed out of home. The reason why people consume more ready-made food out of home is explained by the lack of time available to prepare food (changing time-allocation patterns), falling food prices, and reforms of economic systems. In Vietnam, food consumption patterns changed and food consumed out of home became more popular after the economic reforms of the 1990s. A clear picture of the choices people make when consuming ready-made food out of home in Northern Vietnam is missing. Therefore, the objective of this thesis is to examine the determinants of consumer's preferences on the demand for out of home food consumption in Northern Vietnam, using the data of the consumer behaviour survey of 2018. Cragg's double-hurdle participation model is used to analyse the consumer demand model. The findings indicate that the income, education level, nutritional knowledge, and region affect the decision to consume food out of home. Moreover, gender, income, education level, nutritional knowledge, employment status of the spouse, home production of vegetables and/or fruits, and region are found to influence the amount of food consumed out of home. In addition, this thesis identifies food preferences when consuming ready-made food out of home. The results of the food preference of consumers showed that the intrinsic factor – the appeal of the food – is the most important factor influencing consumer's preference when eating out of home.

Keywords: *Food Consumed Out of Home, Consumer Demand Model, Double-Hurdle Participation Model, Food Preference, Vietnam*

Table of Contents

List of Tables

List of Figures

List of Abbreviations

A4NH	Agriculture for Nutrition and Health
BMI	Body Mass Index
CIAT	International Center for Tropical Agricultural
NIN	National Institute for Nutrition
NPAN	National Plan of Action for Nutrition
OH	Out of Home
VHLSS	Vietnamese Household Living Standard Survey
VND	Vietnamese Dong
WUR	Wageningen University and Research

Chapter 1 Introduction

In the past few decades, food consumption patterns have changed around the world (Godfray et al., 2010; Kearney, 2010; Mergenthaler, Weinberger, and Qaim, 2009; Popkin, 2001; Schmidhuber and Shetty, 2005). These changes can be attributed to demand and supply effects (Godfray et al., 2010). Shifts in agricultural practices – rise in productivity, greater diversity of foods, and less seasonal dependence – are part of the supply effects (Mergenthaler et al., 2009; Kearney, 2010). Supply effects led to falling food prices (Schmidhuber and Shetty, 2005). Demand effects include population and economic growth, changes in income distribution, and effects of urbanisation and globalisation on the food system (Gerbens-Leenes, Nonhebel, and Krol, 2010; Godfray et al., 2010; Kearney, 2010; Pingali, 2007; Popkin, 2001; Schmidhuber and Shetty, 2005). Both the supply and demand effects have contributed to changes in food consumption patterns worldwide.

One change in the food consumption pattern is the increasing importance of the consumption of food and drink out of home (OH) (Bezerra and Sichieri, 2009; Lachat et al., 2011; Lachat et al., 2012; McCracken and Brandt, 1987; Mergenthaler et al., 2009). Due to the increasing importance of OH food consumption, this thesis focusses specifically on OH food patterns. This thesis refers to OH food consumption in case the consumer buys ready-made food (meal or snack) OH. It does not include meals which are prepared at home but eaten outside the home. This is considered as self-made food and not ready-made food. The opposite, ready-made meals which are consumed out of home but eaten at home, are still considered as OH food consumption since the food is not prepared by the consumer or a household member itself. Therefore, in this thesis the preparation process is the central criteria for OH food consumption.

The reason why people consume more ready-made food OH is partly explained by the lack of time available among households to prepare food (changing time-allocation patterns) and falling food prices (Prochaska and Schrimper, 1973; Bonke, 1992). Furthermore, reforms of economic systems play a significant role in the expansion of OH food expenditures (Ma et al., 2006). Vietnam (the focus area of this thesis) is one of the countries which dealt with a rapid economic reform in the 1990s. During this period, food supply diversified, and prices of key products declined, while real household income rose. This led to an increase in OH food expenditure (Thang and Popkin, 2004). The percentage of consumption expenditures on ready-made meals expanded from 7.1% in 2002 up to 12.5% in 2012 (VHLSS, 2012). This increase in OH food consumption caused a major shift in the lifestyles of people in Vietnam and across the world.

Studies link the change in lifestyles and expansion of OH food consumption with higher energy intake, increased body mass index (BMI), as well as lower intake of vegetables and fruit (Bezerra and Sichieri, 2009; Gurthrie, Lin, and Frazao, 2002; Orfanos et al., 2007). A meta study by Lachat et al. (2012) concluded that various researchers have expressed their concerns with regard to larger portion sizes, higher energy densities, lack of consumer information, and a lack of available healthy choices when eating OH. This could turn into a serious health problem in many countries.

However, in Vietnam, conflicting results were published (Lachat et al., 2009). As mentioned before, Vietnam experienced a transition in consumption patterns and rising popularity of OH food consumption (VHLSS, 2012). Even though OH food consumption became more popular, a study by Lachat et al. (2009) revealed healthy changes in the food patterns, due to OH food consumption. They found positive changes of diets, as vitamin intake increased, and energy intake decreased. This is contradictory to most

of the research on increasing OH food consumption. Many studies address the link between OH food consumption and obesity (Bezerra, and Sichieri, 2009; Guthrie et al., 2002; Lachat et al., 2010). The divergent results of Lachat et al. (2009) are very interesting, since so many other studies showed negative changes in diets due to OH food consumption.

What makes the situation in Vietnam even more interesting, is the so-called double burden of malnutrition phenomenon. The double burden of malnutrition exists when a country faces both undernutrition rates and over-nutrition rates. A lot of countries facing economic development, also experience the double burden of malnutrition (SEANUTS, 2012). Until recently, Vietnamese people suffered from high undernutrition rates. Since 1995, when the Government of Vietnam ratified the National Plan of Action for Nutrition (NPAN), improvements in food intake are noticeable. These improvements were facilitated by the focus on poverty reduction of the NPAN. Poverty reduction would lead to higher nutritional status and improvement in food intake. Before 1995, the diets of Vietnamese people consisted mainly of rice, white meat, beans, and fish (which was negligible). Results after the second national survey in 2000 showed clear improvements in the energy intake of the people; where the consumption of staple foods was much higher compared to the first survey in 1987 (Hop, 2003). The improvement in energy intake resulted in a decline in underweight and stunting among under-five children between 1985 and 2001. The percentage of underweight has fallen from 51,5% to 31,9% from 1987 to 2000. Despite these improvements, Vietnam is ranked among the 36 countries worldwide with the highest stunting rates among under-five children (Hop, 2003; Le Nguyen et al., 2013). The number of stunting are especially high in rural areas (Le Nguyen et al., 2013). At the same time, the percentage of children that are overweight are on the rise, as shown in the figure below (WHO, 2018).
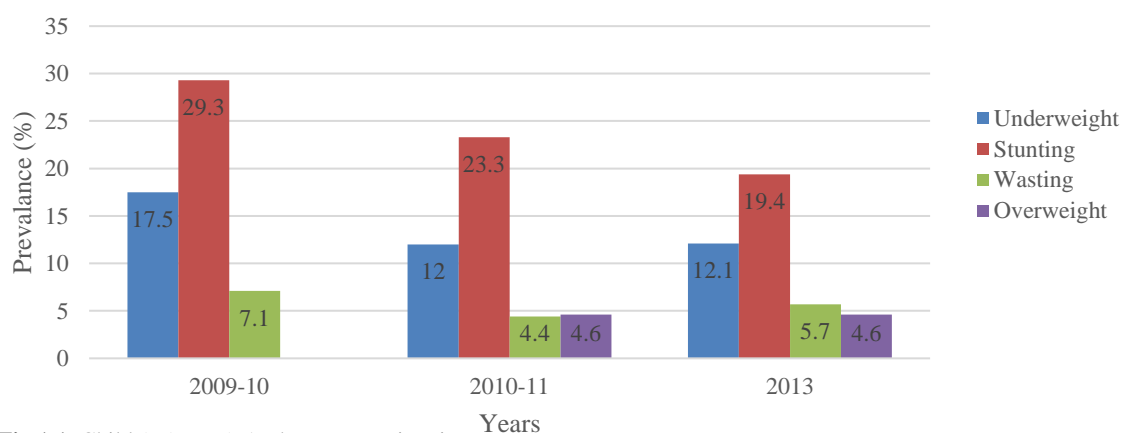
Fig 1.1: Child (<5 years) Anthropometry in Vietnam
(Source WHO, 2018)

The NPAN contributed to an improvement of the nutritional status in Vietnam. However, as undernutrition rates are still considerably high and overweight rates are rising, it is important to keep working on the progress of diets and the nutritional status of the people in Vietnam. To do so, a clear overview of the food systems in Vietnam is crucial.

Agriculture for Nutrition and Health (A4NH) is a programme which aims to understand and improve food systems in Vietnam. A4NH consists of 5 pillars: 1) food systems for healthier diets, 2) biofortification, 3) food safety, 4) supporting policies, programs, and enabling action through research, and 5) improving human health. This thesis contributes to Pillar 1, Food systems for healthier diets, which is led by Wageningen University and Research (WUR). In Vietnam, the programme is executed by CIAT in collaboration with the National Institute of Nutrition of Vietnam (NIN).

Since OH food consumption is gaining popularity and since a clear picture of the choices people make while consuming ready-made food in Northern Vietnam is missing, it is important to research this topic. Therefore, the research question tackled in this thesis is: *What determines people's decision to consume food out of home, and what determines people's preference of the amount of food consumed out of home in rural, semi-urban, and urban areas of Northern Vietnam?* The reasons to consume ready-made food out of home is analysed by the consumer demand model, moreover the food preferences of consumers when eating out of home are observed. What determines people's decision to consume ready-made food and the amount of ready-made food consumed out of home is tested by quantitative data. The food preferences of the consumer is examined by both quantitative and qualitative data. The quantitative data, a consumer behaviour survey, is collected by CIAT in the period July to October 2018. During a field visit to Vietnam, I collected the qualitative data by conducting semi-structured interviews in June 2018.

The main findings of this thesis are that of the different variables of the consumer demand model, the budget constraint of the consumer is, as expected, a limiting factor in the preference to consume food out of home. The results do not show a clear impact of the time constraint of the consumer on the preference to consume food out of home. Only the employment status of the spouse influences the amount of food consumed out of home. Furthermore, price differences, captured by the different regions, affect the decision to consume food out of home and affect the frequency of food consumed out of home. Living in the rural region is negatively linked to the decision to consume food out of home and the frequency of out of home food consumption. Last, of the set of variables indicating the preference of the consumer, only the variables education level of the consumer and the home production of vegetables and/or fruits affect the preference to consume food out of home. The education level is for both the decision and the frequency of eating out of home negatively correlated with the preference to consume food out of home, and the home production of vegetables and/or fruits is negatively linked to the expenditures of food consumed out of home. Moreover, consumers identify the intrinsic value – the appeal of the food – as the most important factor influencing their food preference when eating out of home.

The remainder of the thesis is structured as follows: the next chapter presents the theoretical framework. The consumer demand model and the food preference model will be discussed in this chapter. Chapter 3 presents the methodological design which consists of the study side, data sources and sample selection, and the empirical strategy. The fourth chapter shows the empirical results of the qualitative and quantitative data analysis. Chapter 5 provides the discussion and limitations, and chapter 6, the last chapter of this thesis, presents the conclusions and recommendations.

Chapter 2 Theoretical Framework

As mentioned in the introduction, this thesis focusses on the demand side of food systems. To better understand the underlying theories and concept used in the thesis, this chapter provides an overview of the important theories and concept. In this chapter the consumer demand model is divided into the budget constraint, preferences, optimal choice, and the time constraint. These different elements of the demand model will be addressed individually, and afterwards the elements will be specified for the consumer demand model when consuming food out of home. Next, this chapter will address the hypotheses of the consumer demand model. Last, social and economic theories on food preferences will be combined to link the food preferences of the consumer to the consumption of food out of home.

2.1 The Consumer Demand Model

The empirical strategy of this thesis is based on consumer demand models. The consumer demand model helps to explain the effect of changes in (food) prices, household income, and available time on the demand for a specific good, in this thesis ready-made food. Central in the decision making process is the optimal choice of consumers. The optimal choice of the consumer is the most preferred bundle from his/her budget set (Varian, 2010). Becker (1965) added the importance of the allocation of time to the concept of optimal choice.

Different studies on the demand for eating out of home are taken into consideration to specify the consumer demand model of this thesis. In studies on the demand for food consumed out of home, a lot of authors referred to the model of Prochaska and Schrimper. In their article "*The opportunity cost of time and other socioeconomic effects on away-from-home food consumption*", Prochaska and Schrimper (1973) divided the consumer production theory for eating away from home into four components; a utility function, a production function, a time input constraint for the homemaker, and an income constraint.

In this thesis, time allocation, budget set, and the consumer's utility are combined into the demand model for food consumed out of home. The following sub-sections will explain the general theories on how the preferred bundle, the budget set, and the time allocation are established. And how the effect of changes in price and income are linked to changes in the optimal choice of consumers. Thereafter, the general model will be applied to the context of this thesis, food consumed out of home.

2.1.1 Optimal Choice

Basic economic demand models explain the optimal choice of consumers. The optimal choice of the consumer is the point in which he/she picks the set of bundles that he/she prefers and at the same time that he/she can afford. The optimal choice of the consumer can be described in the form of an indifference curve. The indifference curve consists of all bundles of goods that leave the consumer indifferent to the given bundle. The figure below (Fig 2.1) shows the optimal choice of two goods. The optimum point (x_1^*, x_2^*) in the figure refers to the set of bundles that a person prefers and what he/she can afford. The indifference curve below the budget line represents the choice in which he/she did not reach the maximum yet, while the indifference curve above the budget line represents the choice which he/she cannot afford.

Taking the price and income into account, this optimal choice (x_1^*, x_2^*) at some set of prices and income refers to the consumer's demanded bundle. The consumer's demanded bundle is not the same for each individual, since different preferences lead to different demand bundles. People give different values to the consumption of two goods. Some people are willing to pay a higher price for certain goods compared to others. Basically, the price of a good measures the rate at which people are willing to substitute one good for another, also named the marginal rate of substitution. This is useful to predict what people will consume given certain prices. If we use the example of milk and bread. One person likes milk more than bread while another person likes bread more than milk. Changes in price of milk will affect the optimal choice for the two persons differently, due to differences in preferences of people. If a person chooses one bundle while another bundle is also affordable, then you can say something about the preferences of the person. In this case, the first bundle is preferred to the second. This example highlights the influence of changes in price of a certain good. Sub-section 2.1.4 will further elaborate on changes in price and income related to the optimal choice of consumers.
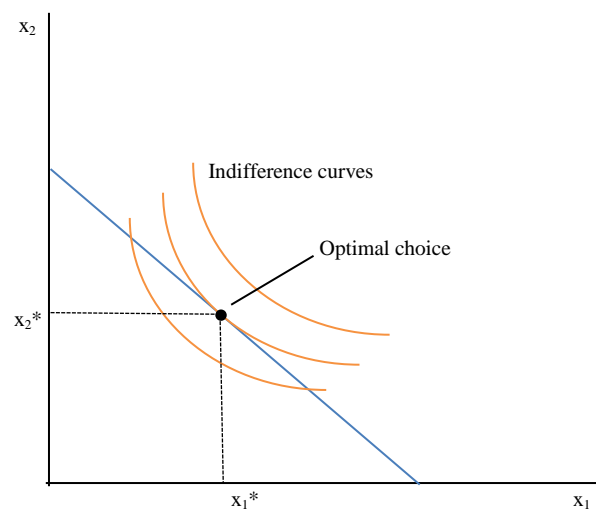
Fig 2.1: Optimal choice: the optimal consumption position
is where the indifference curve is tangent to the budget line.

2.1.2 Budget Constraint

Now we know the optimal choice is influenced by the budget set of the consumer, but how? The budget set of a consumer equals the available income of a consumer. Income is not infinite, so the available income influences the consumption pattern of consumers. The limited budget set is called the budget constraint of the consumer. The budget constraint consists of two components; a consumption bundle, which identifies how much units a consumer choses of a specific good, and the budget set of the consumer. The following equation represents a possible budget constraint in which x_1 represents good 1 and x_2 good 2. This equation consists of only two goods, however in reality more complex consumption bundles are common.

$$p_1 x_1 + p_2 x_2 \leq m \ (2.1)$$

p_1 equals the price for good 1 and p_2 the price for good 2. This equation states that the amount of money spent on both goods cannot be more than the total amount of money the consumer has to spend in total (m). So, income limits the consumption level of consumers, people cannot spend more money than they have. The next question is what do people buy with the available budget set? This depends on their preferences, which is explained in the next sub-section.

2.1.3 Utility

As stated before, the optimal choice is influenced by the utility of consumers. Consumers rank various consumption possibilities. The way in which the consumer ranks the consumption bundles describes the consumer's preference. There are different types of preferences; strict preference, weak preference, and indifference. Strict means that a consumer always prefers one bundle of goods above another bundle of goods, weak preference means that a consumer prefers one bundle of goods slightly more than another bundle of goods, while indifference means that a consumer does not prefer on bundle of good above another bundle of goods.

In economic analyses, preferences of consumers are often formulated as a utility function. A utility function is described by Varian (2010) as follows:

"A utility function is a way of assigning a number to every possible consumption bundle such that more-preferred bundles get assigned larger numbers than less-preferred bundles. That is, a bundle (x₁, x₂) is preferred to a bundle (y₁, y₂) if and only if the utility of (x₁, x₂) is larger than the utility of (y₁, y₂)" (Varian, 2010 p.55)

A utility function is a way to label indifference curves such that higher indifference curves get larger numbers. The numerical magnitudes of utility levels have no intrinsic meaning. A standard utility function of two goods, x_1 and x_2 is written as:

$$U = U(x_1, x_2, l; Z) \quad (2.2)$$

in which l represents the leisure time of the consumer and Z the preferences.

Lancaster (1966) promoted the new approach to consumer theory, in which he promoted new insights on people's utility and preference. He stated that goods consist of multiple characteristics. Different goods can share some of the same characteristics. For example, a mobile phone and a laptop are two different goods. However, they share a lot of the same characteristics. Both a mobile phone and a laptop have a camera function and they have a function to browse on the internet. The laptop and mobile phone also differ in characteristics. A mobile phone is mainly used to call people, while a laptop is designed mostly for work related activities. These differences in characteristics determine the utility of the consumer. It is not the good itself, but the characteristics of a good that give rise to utility. Due to the theory of Lancaster, goods are not seen as one element but as a combination of multiple characteristics which all influence the utility of a consumer.

2.1.4 The Effect of Income and Price Changes

So far, the optimal choice is derived from the budget constraint and the utility of consumers. However, the budget constraint and utility can change over time due to different reasons – a new job, salary changes, changing sales, or changes in prices. The changes in income and price affect the consumption patterns. Elasticity is often used to measure the effect of changes in income and prices. Elasticity means the percentage change that will take place in one variable in response to a 1 percent increase in another variable. For example, the price elasticity of demand measures the sensitivity of quantity demanded to price changes. The equation is written as:

$$E_p = \frac{(\%\Delta Q)}{(\%\Delta P)} \quad (2.3)$$

where %ΔQ represents the percentage change in Q and %ΔP the percentage change in P. Another type of elasticity is the income elasticity of demand, which is the percentage change in the quantity demanded, Q, resulting from a 1 percent increase in income, I.

$$E_I = \frac{\Delta Q / Q}{\Delta I / I} \quad (2.4)$$

Next to the income elasticity, cross-price elasticity also affects the demand for specific products. Cross-price elasticity reflects changes in demand for a particular commodity, Q_l, when prices of other products change, P_m (Varian, 2010).

$$E_{Q_l P_m} = \frac{\Delta Q_l / Q_l}{\Delta P_m / P_m} \quad (2.5)$$

These three types of elasticity are important if you want to analyse the relation between consumption of certain bundles and income, as changes in price, income, and price of other commodities affect directly the food consumption of another commodity. Hence, it is important when analysing the consumption behaviour when buying ready-made food out of home. Two well-known theories, which discuss the effect of changes in income on food consumption patterns, are Engel's Law and Bennett's Law. Engel's Law states that if income increases, the proportion of the budget spent on food decreases. (Godfray et al., 2010; Timmer, Falcon, and Pearson, 1983). This would imply that food costs of consumers in developing countries cover a larger proportion of their income than for consumers in developed countries, which are on average richer than consumers in developing countries. Hence, price changes in the food sector have a stronger effect on the total expenditures of consumers in developing countries compared to developed countries (Caballero, 2005; Timmer et al., 1983). Next to Engel's Law, Bennett's Law states that if income increases, the proportion of the budget spent on 'starchy-staples' decreases. This reflects a desire for dietary diversity. There is a limitation to the two theories. Both theories show the outcomes of changes in income on food consumption patterns in general, but these theories, however, do not analyse the individual family behaviour (Timmer et al., 1983).

Timmer et al. (1983) combine Engel's Law and Bennett's Law in the figure below (Fig. 2.2). The "Food expenditure" represents Engel's Law and "Starchy staples" Bennett's Law. The graph shows that if income increases, the quality of food consumed increases as well. It also shows a decline in the amount of 'starchy staples when income increases. Thus, poor people spend more of their income on starchy staples.

A study by Gale and Huang (2007) revealed the same results as Timmer et al. (1983). Their study in China showed that both the quantity and quality of food demand rose when the income of people increased. Especially poor households faced impressive growth in food quantity and quality. But not only low income classes face quality improvements, the food quality rose with income at all income levels. Safety reasons are one of the reasons to buy higher quality food products.

Gale and Huang (2007) confirmed that the theory of Engel's Law and Bennet's Law is applicable to the case of China. When people's income increased, the share on food decreases. There is a maximum on the food quantity, so food quantity will not rise until infinity. Bennett's Law, which stated that the quality of the diets of people will increase if income increases, is also revealed in China. The diets of the Chinese people changed from a starch-based diet towards more animal protein-based diets. Moreover, people bought products of higher quality and more expensive brands.
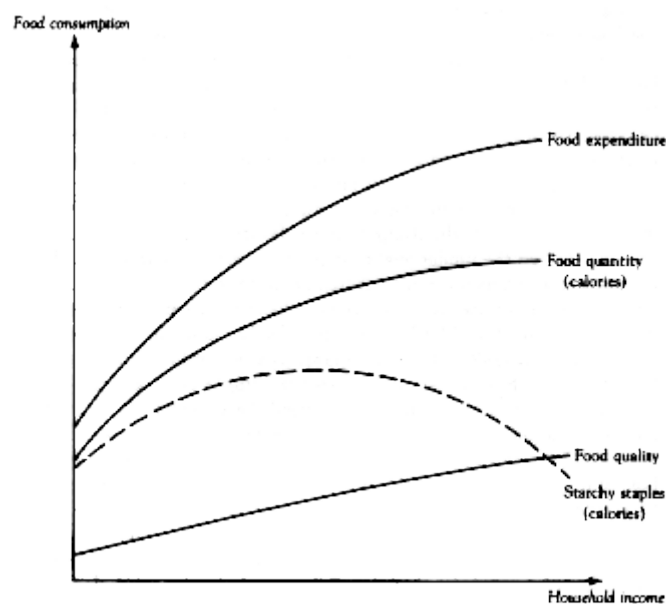
Fig. 2.2: Various measures of food consumption relative to household income level

Note: The figure is drawn in logarithms to illustrate elasticities. (log) Food quality = (log)food expenditure - (log) quantity. *Source: Timmer et al. (1983). p. 57.*

2.1.5 Time Constraint

An additional element to the demand model is the influence of time. The theory of the allocation on time is a well-known theory analysing the influence of time constraint on decision making processes. Becker's theory of the allocation of time concludes that consumers allocate its time to one of three uses: labour market time, household production time, and consumption time. Hence, if you spend more time on generating income (labour time), you have less time available to spend on cooking or eating. Since the introduction of Becker's theory, time has become an important parameter in consumer's theory. Not only the budget constraint and preferences are seen as factors influencing consumer's decision, but time allocation as well. The theory of Becker is useful to understand how people decide to consume ready-made food or prepare (cook) their own food, because this is related to the available time people have. If household members work a lot of hours on generating an income, they have on the one hand less time available to cook and on the other hand more money to spend on food. In that case, one of the options would be to buy ready-made food.

The function related to the time constraint of a consumer equals the following:

$$T \leq L_m + L_h + l \ (2.6)$$

Where T represents the time constraint, L_m the labour market time, L_h the household production time, and l the leisure time.

Based on the idea of Becker, Bonke (1992) conducted a research on the choice of foods. Bonke concluded that there is a relation between the level of income and the time spend on household activities. A consumer with more available money – due to more labour market time - and less time to spend on household activities, will have less time to spend on cooking (household production time) and because of this, the consumer will consume more convenient foods. This is in line with the theory of Becker, since more time spend on generating income will lead to less time spend on production and consumption time. Bonke argued that richer households, which spend more time on working and less time on cooking,

are supposed to demand a higher proportion of convenience foods, as shown in Figure 2.3. Changes in OH food consumption patterns could therefore be linked to the allocation of time of households.

Fig 2.3: Percent expenditures on foodstuffs in different households in Denmark (*Source: Bonke, 1992)*

2.1.6 Applying the Reduced Form for Food Consumption Out of Home

The previous sub-sections explained the theories behind the consumer demand model. Now, the demand model will be specified to the demand for consumption of ready-made meals. Consumers can choose between food consumed out of home and food consumed at home. As defined previously in this thesis, prices of food products, the budget set, time endowment, and the utility influence the decision of the consumer to consume food at or out of home. Now, the general budget set, the utility function, and the time constraint will be transformed into the context of this thesis.

The general budget set of the consumer is explained in section 2.1.2. In this thesis, the budget set is influenced by the prices of food out of home (Po), prices food prepared at home (Ph), and prices of non-food market goods (Pm). The following budget set is specified for this thesis:

$$P_m X_m + P_o X_o + P_h X_h \leq m \text{ (2.7)}$$

in which Xm represents non-food market goods, Xo food consumed out of home, Xh food consumed at home, and m the available budget of the consumer. Xo and Xh together represent the food purchases (Xf). The following equation for food purchases is derived:

$$X_f = X_o + F(L_h, X_h) \text{ (2.8)}$$

As the equation shows, the food consumed at home, Xh, is influenced by the available household time, Lh. The utility function of the consumer specified for this thesis is:

$$U = U(X_m, X_f, l; Z) \text{ (2.9)}$$

Xm in this function represents the non-food market goods, Xf represents the food purchases, *l* represents the leisure time of the consumer, Z the preferences.

Last, the time constraint, which consists of the labour time, household time, and leisure time, in this thesis equals equation 2.6, mentioned in section 2.1.5. In this thesis, labour time is assumed to be constant, due to limited flexibility in the amount of hours worked on a day. Therefore, this thesis considers the employment status of the consumer as an indicator for labour time.

Combining the different elements of the consumer's food demand model, the final consumer food demand model is specified as follows:

$$F_o = F(p, T, m, Z) \text{ (2.10)}$$

in which F_o represents the food consumed out of home, p the prices, T the time endowment, m the budget set, and Z the preferences.

F_o is divided into two components; the choice to consumed food out of home and the amount of food consumed out of home. Both components are influenced by the same factors.

Differences in prices of (food) products (p) are captured by the three different locations; urban, semi-urban, and rural region. It is assumed that consumers in the same district face the same level of market prices for goods.

As discussed in section 2.1.5, the time endowment influences the division of the labour time, household time, and leisure time. In this study case, time endowment consists of the employment status of the respondent (since work hours are considered as given), travel time to work or school, the household size, and the household composition. The employment status of the respondent in this study population consists of the household member responsible for the food purchases and food preparations (household manager). Since respondents in similar literature on food consumed out of home are often the household member responsible for the income (household head), I also included the employment status of the spouse in the model. Moreover, the household size is included as time factor due to the scale economies associated with household meal preparation. Preparing a meal for one person is relatively more time consuming than preparing a meal for multiple persons. Last, the household composition is the share of preschool age children in the household. Preschool age children need care during the day which would restrict parents to both work fulltime. If one of the parents stays at home, this parent will spend more time at home and therefore consume less meals out of home.

In this reduced form, m, the budget set, represents the total household income. Since I assume consumers have limited flexibility in the amount of hours they work, m in this thesis represents the income.

The preference of the consumer consists of a set of variables indicating the individual and household characteristics of the consumer. Individual characteristics included in the model are: age, gender, education level, and nutritional knowledge of the household manager. The educational level is separated in two categories; the household manager completed an education level higher than primary school and the household manager completed an education level higher than secondary school. The nutritional knowledge of the household manager is calculated as the share of correct provided answers of a set of 40 questions about nutritional knowledge. Furthermore, the household characteristics included in the model are: the household production of vegetables and/or fruits for home consumption, and the raise of livestock for home consumption. If the household produces its own vegetables and/or fruits or raises livestock for home consumption. In case the consumer produces its own vegetables and/or fruits or raises livestock, the costs to prepare a meal at home decreases and therefore it becomes more convenient to consume a meal at home compared to consume a meal out of home.

2.2 Hypotheses

The demand model of food consumed out of home is explained and specified in section 2.1. Four components are expected to influence the decision of the consumer to consume food out of home: the time constraint, the prices, the budget set, and the preferences.

The model clarifies to what extent the different components influence the decision to consume food out of home and the amount of food consumed out of home. Below the different expected effects on the decision to consume food out of home are discussed.

First, the effect of the time constraint on the preference to consume out of home is addressed. As discussed in section 2.1.5, the available time to consume food is influenced by the time spend on labour, time spend on household labour, and leisure time. It is expected that people who are employed will consume more food out of home, since these people are expected to have less time available to prepare the food at home and have more money to spend on food (Bonke, 1992). Since similar studies targeted the household member responsible for most of the income (household head) in their study, this thesis included in the model the effect of the employment status of both the household manager (target group of the survey used in this thesis) and the spouse of the household manager (household head). The employment status of the spouse of the household manager is expected to positively correlate with the amount of food consumed out of home (Bonke, 1992; Nayga and Capps, 1994). The household manager's employment status is also expected to positively correlate with food consumed out of home. Studies which included the employment status of women who were responsible for the food purchases and preparations in the household, concluded that in case the women were employed, the households consumption of food out of home increased (Hiemstra and Kim, 1995; Yen, 1994).

Another time related issue is the distance people have to travel to work. It is expected that the distance correlates positively with the amount of food consumed out of home (Bonke, 1992; Nayga and Capps, 1994; Prochaska and Schrimper, 1973). Moreover, the household size has a negative impact on the consumption of food out of home. This reflects the scale economies associated with household meal preparation. Preparing a meal for one person costs more money and time compared to preparing a meal for more people. Hence, households consisting of one or two household members consume more meals out of home compared to larger households (Binkley, 2006; Nayga and Capps, 1994; Redman, 1980). Last component of the time endowment is the household composition. The household composition and the home production for self-consumption are the household characteristics. The household composition, indicating the amount of pre-school age children, has a negative impact on the consumption of food out of home. By holding the family size constant, the presence of pre-school age children tends to reduce the number of meals consumed out of home (Prochaska and Schrimper, 1973; Mihalopoulos and Demoussis, 2001; Stewart and Yen, 2004). This could be explained by the fact that a household member will stay at home to take care of the pre-school age children. This household member who stays at home is expected to consume less meals out of home.

Second, previous similar studies concluded households living in urban areas consume more meals out of home compared to rural households, due to the higher availability of outlets where ready-made food is sold in urban areas (Binkley, 2006; Lachat et al., 2011). The reason for including the region dummies urban, semi-urban, and rural was to capture price differences among different regions.

Third, in this thesis the budget set is defined as the total income of the household. The total income of the household is expected to have a positive effects on the expenditures of food consumed out of home, due to a higher income elasticity of demand for food out of home relative to demand for food at home (Prochaska and Schrimper, 1973). Many other studies concluded that income has a positive effect on the amount of food consumed out of home (Binkley, 2006; Hiemstra and Kim, 1995; Nayga and Capps, 1994; Stewart and Yen, 2004; Stewart et al., 2005). A case study of urban China, concluded that income growth led to an increase in the share of expenditures on food consumed out of home, while the food expenditures of food consumed at home decreased (Ma et al., 2006).

Last, the preferences of the consumer consist of the individual and household characteristics. Individual characteristics include age, gender, education level, and nutritional knowledge. Age is expected to correlate negatively with the amount of food consumed out of home. Younger people are expected to consume more food out of home, since they are expected to prefer convenient (out of home) food options (Stewart and Yen, 2004). Moreover, research have shown that women eat out less often compared to men, since women are expected to spend more time at the house. However, in case the woman is employed, she will consume more food out of home compared to unemployed women (Binkley, 2006; Redman, 1980; Nayga and Capps, 1992). Furthermore, previous studies detected mixed effects of the influence of the education level on the preference to consume food out of home. Some studies claimed to detect positive relations between a higher completed education level and food consumption out of home (Mihalopoulos and Demoussis, 2001; Stewart and Yen, 2004; Stewart et al., 2005). While McCracken and Brandt (1987) did not find a significant effect. And some studies did not include the education level in their model (Nayga and Capps, 1992; Prochaska and Schrimper, 1973). Due to the mixed results on the influence of the education level on the preference to consume food out of home, it is unclear how the education level will affect the preference to consume food out of home in this case study. The last component of the individual characteristics is the nutritional knowledge – the score of 40 nutritional knowledge questions – of the respondent. Binkley (2006) expected that consumers with a higher nutritional knowledge would consume less food out of home due to the fact that out of home food consumption is often associated with unhealthy food options. However, as Lachat et al. (2009) concluded, food consumption out of home is associated with a healthier diet in Vietnam. Consumers with a higher nutritional knowledge, who are expected to consume more healthy food options, will consume more food out of home due to the healthy food options. Therefore, the effect of nutritional knowledge on food consumed out of home is expected to have a positive effect on the decision to consume food out of home in Vietnam. In addition, the household characteristic home production for self-consumption consists of the production of vegetables and/or fruits and the raise of livestock. Both are expected to have a negative impact on the consumption of food out of home.

2.3 Linking Social and Economic Concepts: Food Preference

Food preference is a highly complex concept where multiple factors are interconnected. So far, the preference of the consumer is explained as the set of bundles which he/she prefers above another set of bundles. In the consumer demand model, the preference of the consumer is linked to individual and household characteristics. In literature about food consumption, food preference is also defined as the indication of the amount of satisfaction an individual experiences from eating a type of food (Asp, 1999; Story, Neumarkt-Sztainer, and French, 2002). Food preference is an important concept in the literature on food consumption decision-making and behaviour economics (Birch, 1999; Randall and Sanjur, 1981; Sobal and Bisogni, 2009). It is important, since it is seen as one of the strongest predictors of food

choices. When consuming food, a lot of decisions are made, including what, where, when, with whom, how long, and how much to eat. A study among students in the USA revealed that considering all these different decisions, the students made on average 220 food decisions per day (Wansink and Sobal, 2007). Therefore, it is very interesting to look into the decision-making process of food consumption. This thesis dives into the decision-making process of consumers by comparing the amount of satisfaction a consumer experiences of a set of factors indicating the food preference.

There are different factors linked to the food preference of consumers. Food preference is often linked to taste, pleasure, or familiarity (Birch, 1999). Moreover, Story et al. (2002) highlighted the importance of early childhood experiences with food and eating. However, there are a lot of other factors influencing the preference of consumers. The preference for a specific food type originates from the birth and continues to have an impact throughout life. Khan and Hackler (1981) combined 7 factors and many sub-factors in the theory on food preferences. According to Khan and Hackler, intrinsic, extrinsic, socioeconomic, personal, educational, cultural, and biological, physiological and psychological factors affect the food preference. Although the theory consists of multiple factors, the list of Khan and Hackler is not exhaustive and is dynamic. Hence, I have chosen to adapt some changes to their model and combine it with other literature to specify the sub-factors to the case study of this thesis. Figure 2.4 outlines all the different factors.
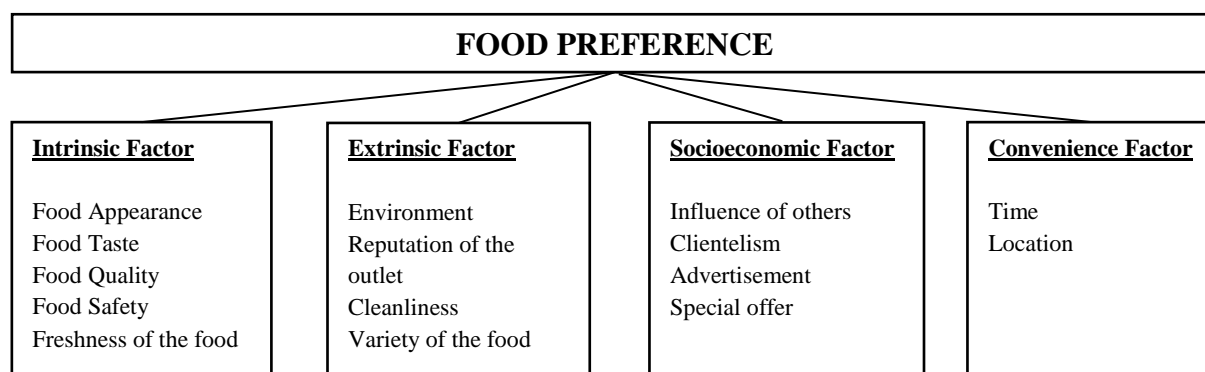
Fig. 2.4: Food preference
(based on: Binkley, 2006; Birch, 1999; EUFIC, 2006; Khan and Hackler, 1981; Randall and Sanjur, 1981; Stewart et al., 2005; Story et al., 2002)

As figure 2.4 shows, the food preference of the consumer is divided into four factors; intrinsic factor, extrinsic factor, socioeconomic factor, and convenience factor. The intrinsic factor highlights the appeal of the food, including the appearance, taste, quality, safety and freshness of the food. The extrinsic factor – the appearance of the outlet – includes the environment (service), reputation of the outlet, cleanliness, and variety of the served food. Influence of others (family & friends and doctor & dietician), clientelism, advertisement, and special offer represent the socioeconomic factor. While time and location define the convenience factor. In appendix A, the factors are discussed in detail. This thesis will address the importance of the different (sub-)factor in the decision-making process of consumers when they consume food.

Chapter 3 Data and Methodological Design

This chapter provides information regarding the methodological design of the thesis. First, the study site of the thesis is addressed. Second, the different data sources and the sample selection are highlighted. Third, and last, the empirical strategy and methods are discussed.

3.1 Study Site

The study site of this thesis is the Red River Delta and Northwest region in Northern Vietnam. The focus is on three different districts; urban, semi-urban, and rural district. The division between urban, semi-urban, and rural districts is important for this thesis, since there are different stages of development among rural, semi-urban, and urban areas in Vietnam (Thang and Popkin, 2004). Therefore, different outcomes are expected among the different districts. For this study, the Cầu Giấy district, the Đông Anh district, and the Mộc Châu district were selected as urban, semi-urban, and rural districts respectively. Cầu Giấy and Đông Anh are the two districts in the Red River Delta region and Mộc Châu in the Northwest region. The urban district, Cầu Giấy, has a population of around 237.000 people, the semi-urban district, Đông Anh, has in total a population around 375.000 people, and the rural district, Mộc Châu, includes a population around 105.000 people.

Vietnam has faced remarkable economic growth rates since the end of the 1980s, due to the economic and political reform (Doi Moi). The economic growth rates led to improvements in the nutritional status of the Vietnamese people. The food intake increased during the 1990s and was linked to the economic growth in the country. Nonetheless, poor households and rural households still experience higher rates of undernutrition compared to non-poor and urban households. However, greater improvements in food intake are seen among the poor households (Thang and Popkin, 2004).

In Vietnam, it is common to buy your ready-made food on the streets. Food on the street is cheap, and you can find a street vendor on every street corner. As mentioned in the introduction, the consumption of out of home food has become more and more important in the life of the Vietnamese people. However, out of home food consumption is more present in urban areas compared to rural areas. The VHLSS (2012) indicated a difference in percentage of expenditures on out of home meals of the total consumption expenditures between rural and urban areas. The expenditures in rural areas were 10.1% and in urban areas 15.6% in 2012 (VHLSS, 2012).

3.2 Data Sources and Sample Selection

The data used in this thesis are derived from a consumer behaviour survey and semi-structured interviews. The consumer behaviour survey was conducted by CIAT between July and October 2018. The purpose of the survey was to collect data on food intake and preferences, and consumer behaviour. The survey contained sections on the socioeconomic status of the household, food consumption, food habits and preferences, nutritional knowledge, food safety, and risk perception. I included several questions concerning food preferences when eating out of home to the survey. These questions contributed to the analysis on the determinants to consume food out of home and food preferences of consumers.

The consumer behaviour survey is part of the A4NH programme. Next to the consumer behaviour survey, a 24h dietary recall is conducted in collaboration with NIN. The 24h dietary recall contains of detailed questions regarding the food intake of the last 24 hours. This thesis does not include data of the 24h dietary recall.

The sample of the survey consists of households in the three previously mentioned districts. These three districts are classified as strata, since they are not randomly selected. For the sample selection two stage clustering is applied with probability proportion size methods to ensure that the probability to select a unit is proportional to its size. The clusters are 10 communes within each district. The second stage of clustering is the selection of households which match the criteria of the study. The A4NH programme focusses on the person who takes care of food purchases and preparations in the household. The respondent is the person taking care of the food purchases and/or food preparations (the household manager).

In each district 250 households were selected, which leads to a total sample size of 750 households. Within the districts, 126 households only participated in the consumer behaviour survey and the other 124 participated in both the 24h dietary recall and the consumer behaviour survey. In the end, of the 750 selected households, 722 actually participated and finished the consumer behaviour survey. For each selected household, a back-up household was randomly assigned. However, in case none of the household members in the selected and back-up households were present, the observation was dropped.

Next to the quantitative data, this thesis also used qualitative data. During a field visit to Vietnam, I conducted semi-structured interviews in June 2018. With the help of a translator, I conducted 21 interviews in the urban (18) and semi-urban (3) districts. Due to logistic reasons, it was not possible to conduct interviews in the rural area. However, I visited Mộc Châu for the weekend, to explore the area. The sample consists of people who consumed food at street vendors and small restaurants. The outlets were selected while driving through the districts. All the respondents were people who consumed food out of home.

Since I visited different restaurants and street vendors, I mastered to interview a mixed group of people. Both men and women, young and old, students, employed people, and people who enjoy their retirement. However, the sample is not random. The different locations and respondents were not randomly selected. Not all street vendors and local restaurants are officially registered, so I decided to pick the locations while driving through Cầu Giấy and Đông Anh. Together with my translator, we picked locations around offices, universities/colleges, and residential areas. Hence, the variety of the respondents increased. When arrived at a location, we would order some food and pick a table. We approached people who finished or nearly finished with their meals, so people could eat their meal in peace. We would introduce ourselves and explain briefly who I was and introduced the thesis topic. We asked the respondents if they were willing to answer a few questions. The interview consisted of questions related to the choice for food consumption out of home and their food preference. The questions are based on the central theories discussed in the thesis. An overview of the interview questions is presented in Appendix B. The results of the interviews contribute to the analysis of the food preferences when eating out. The results are used as additional information to the quantitative data. The interviews are useful to understand the local food habits and practices.

Before the results of the qualitative data are provided, I would like to state that I am fully aware of my role as researcher in the qualitative part, both the interviews and the analysis afterwards, of this thesis. My personal involvement influenced the preparation of the interviews, the interviews itself, and the

coding and structuring of the answers afterwards. The fact that I both made the questions and interpret the results, leads to a possible bias of the results. The involvement of the researcher is somethings that should be taken into account while reading the results. Next to my role, the translator played a role in the interpretation of the responses of the respondents as well. To limit the influence of the translators and myself on the qualitative results, I asked natural questions based on the consumer behaviour survey. Moreover, my translator was not aware of the hypotheses, to prevent him of interpreting answers of respondents differently.

3.3 Empirical Strategy

In the previous chapter the consumer demand model described the optimal choice of consumers, which is affected by the budget constraint, time constraints, prices, and utility. In this section, the translation of the consumer demand model into the empirical strategy is highlighted to answer the research question: *What determines people's decision to consume food out of home, and what determines people's preference of the amount of food consumed out of home in rural, semi-urban, and urban areas of Northern Vietnam?*

Due to the relatively high proportion of zero observations in the dependent variables, Cragg's model is used to answer the research question. Cragg's model is an extension to the Tobit model, the model for censored dependent variables. Both the Tobit model and Cragg's model analyse the choice between 0 and a continuous variable (Dougherty, 2016). Do you consume food out of home (choice between 0 and 1), if yes, what is the optimal consumption amount given the consumer's circumstances (the continuous variable)? The last part, how much, is important in this thesis, since the amount of out of home food consumption could influence the food choice of people. There is a difference between people who consume food out of home once a week and people who consume food out of home on a daily basis (or multiple times a day).

The main drawback of the Tobit model is that a single mechanism determines the choice between y=0 versus y>0 and the amount of y given y>0. An alternative to the Tobit model is Cragg's model, which integrates the probability of y>0 (Probit model) and the truncated normal model (Tobit model) for given positive values of y (Burke, 2009; Cragg, 1971; Wooldridge, 2002). Cragg's model contains of a selection and outcome equation, or also defined as the participation and quantity decision. In this thesis, the desire to consume ready-made meals out of home represents the selection equation; the consumer decided to participate in the market. And the level of consumption represents outcome equation; the consumer determines an optimal consumption amount given his or her circumstances. The selection and outcome equation are written as:

$$S_i^* = X_{1i}\gamma + \varepsilon_i, \qquad \varepsilon_i \sim N(0,1) \quad \text{(selection equation)} \qquad (3.1)$$
$$Y_i^* = X_{2i}\beta + u_i, \qquad u_i \sim N(0, \sigma_i^2) \quad \text{(outcome equation)} \qquad (3.2)$$

S_i^* represents the net effect of the various factors that influence the desire to consume. If the net effect is greater than zero, then the consumer decides to consume ready-made meals out of home. Y_i^* represents the net effect of the various factors that influence the level of consumption. X_{1i} and X_{2i}, the two explanatory variables, could include the same variables, however it is assumed that the variables influence the latent variables differently. The relationship between the observed dependent variable Y_i and the latent variables S_i^* and Y_i^* is:

$$Y_i = Y_i^* = X_{2i}\beta + u_i \qquad \text{if } S_i^* > 0 \text{ and } Y_i^* > 0 \quad (3.3)$$
$$Y_i = 0 \qquad \qquad \text{otherwise} \qquad (3.4)$$

In chapter 2, the reduced form function of the consumer demand model is given. In this thesis, X_{1i} and X_{2i} contain the variables time constraint, budget set, (food) prices, and preferences.

Included in the empirical results are the marginal effects of the independent variables on the dependent variables. The marginal effects help to explain how the dependent variables changes when an independent variable changes, while the other independent variables are held constant.

Table 3.1 shows the variables included in the model. The outcome variable of the model is divided into two parts; does the respondent consumes ready-made food out of home and if yes, what is the amount of ready-made food consumed out of home? The first part is a dummy variable for eating out yes or no and the second part is calculated by two continuous variables; the expenditures and frequency of eating out. The consumer behaviour survey provides data on both these aspects.

From the theory, four different independent variables arise, the time constraint, the budget set, price differences, and the preferences. The following table provides an overview of the dependent and independent variables.

Table 3.1: Composition of variables of the household food consumption model

Empirical model	Variables	Description
Dependent Variables		
Dependent variable 1: Food consumed out of home	Food consumed out of home in the last 7 days	*1= yes*
Dependent variable 2: Amount of food consumed out of home	Total expenditures of food consumed out of home	*Total expenditures of the last 7 days in VND (x1000)*
	Total amount of meals consumed out of home	*Total amount of meals consumed out of home the last 7 days*
Independent Variables		
Time constraint	Employed or student	*1=yes*
	Employment status spouse	*1=yes (employed)*
	Time traveling to work	*Time in minutes*
	Household size	*Total of household members*
	Household composition	*Share of preschool age children*
Budget set	Household's total income	*Income earned by all household members and property rent in Vietnamese million VND. Divided into three dummy variables (income class 1 (zero-6.9 million VND), income class 2 (7-12.9 million VND), and income class 3 (more than 13 million VND)*
Prices	Geographical region	*Urban, semi-urban & rural*
Preferences	Age	*Age in years*
	Gender	*1=male*
	Education level	*Dummy variables (higher than primary education & higher than secondary education), 1=yes*
	Nutritional knowledge	*% correct of 40 questions*
	Home production for self-consumption	*1=yes*

Analysing the Food Preferences of the Respondents

Next to the consumer demand model, I will also analyse the food preferences of people when eating out of home and when eating at home. Since the effects of food preferences of consumers is not included in previous studies, the food preferences are not part of the consumer demand model but examined separately. Only descriptive statistics will be provided for this part of the thesis. The quantitative results will be compared with the qualitative results.

The food preference of the consumer will be discussed in detail. The main food characteristics and the main factors influencing the food preferences of the consumer will be analysed as well as the food preference factors defined in section 2.3. The food preference of the consumer consists of 4 components: intrinsic, extrinsic, socioeconomic, and convenience factors. The intrinsic factor – the appeal of the food – consist of the appearance, taste, quality, safety, and freshness. The extrinsic factor consist of the environment (service), reputation of the outlet, cleanliness, and the variety of the food the location offers. Recommended by friends/family, recommended by doctor/dietician, advertised in the media, special offer of the vendor, and clientelism are considered as the socioeconomic factors. Last, convenience is divided into the convenience of the location and time consideration. For these factors, consumers indicate how important they rank the defined food preference factors. Consumers choose between scores ranged from 1-5, in which 5 represented the highest score of importance and 1 the lowest. Food preference is divided into food preference when eating at home and food preference when eating out of home.

Chapter 4 Empirical Results

In this chapter, the empirical results are presented and discussed. The chapter presents the descriptive statistics of the study population, followed by the empirical results of the research question. The research question is split into two elements: 1) the question if the respondent consumed food out of home yes or no, and 2) the amount of food consumed out of home. Last, the food preferences of the consumer will be analysed.

4.1 Descriptive Statistics

To understand the context and background of the study population, a list of descriptive statistics is presented. The descriptive statistics cover the general information of the respondents and the households they live in. Moreover, the descriptive statistics focus on the independent and dependent variables of the model explained in section 3.3. First the descriptive statistics of the quantitative results are presented, and second the basic characteristics of the respondents of the qualitative results are discussed.

4.1.1 Descriptive Statistics of the Quantitative Results

Table 4.1 shows general background characteristics of the respondents. Respondents were on average 46.5 years old. The maximum value of age equals 88, which means that at least one of the respondents was 88 years old. Moreover, nearly all respondents were female (89.38%), this could be explained by the fact that the respondents are the people preparing the food at home. In general, women are more often responsible for the work in the household.

Table 4.1 Descriptive characteristics of respondents

Variable	N	Mean	Std. Dev.	Min	Max
Age	612	46.54	14.67264	19	88
Gender *(1=male)*	612	.1062	.3083572	0	1

Table 4.2 indicates the division of the geographical regions. Of the 612 respondents, 31.86% live in the urban region, Cầu Giấy, 33.17% live in the semi-urban region, Đông Anh, and 34.97% live in the rural region, Mộc Châu. The urban region is represented least in the sample population.

Table 4.2 Geographical region of respondents

Region	Freq.	Percent	Cum.
Urban	195	31.86	31.86
Semi-urban	203	33.17	65.03
Rural	214	34.97	100.00
Total	**612**	**100.00**	

Table 4.3 specifies the education level of the respondents. Secondary school represents the highest frequency of the education levels (28.27%). 20.92% of the respondents indicated that their highest formal education was high school. The education level of the respondents of the study population are not very representative compared to the whole of Vietnam. In Vietnam in 2012, only 0.3% of the total population graduated from a postgraduate education (VHLSS, 2012). In this study population 3.27% indicated that they graduated from a postgraduate education. Also the percentage of university graduates

in this study population (16.50%) is much higher compared to the whole of Vietnam (7,1%). The difference between the education level of the whole of Vietnam and this study population should be taken into account when analysing the empirical results.

Table 4.3 Education level of the respondent

Education respondent	Freq.	Percent	Cum.
No formal education completed	62	10.13	10.13
Primary school	84	13.73	23.86
Secondary school	173	28.27	52.12
High school	128	20.92	73.04
Vocational college	44	7.19	80.23
University	101	16.50	96.73
Postgraduate	20	3.27	100.00
Total	**612**	**100.00**	

Note: the education level equals the highest level of formal education that the respondent has completed

Table 4.4 shows the nutritional knowledge of the respondents. The nutritional knowledge equals the total score based on 40 different nutritional knowledge questions. Participants could earn 1 point for each correct answer, 0 points if the respondent was not sure about the answer, and they would lose 1 point for each incorrect answer. The respondents scored on average for the nutritional knowledge questions a 0.36, which indicates that on average the respondents answered more questions correctly than incorrectly. The minimum value of -.3 shows that at least one respondent answered more questions incorrect than correct. In addition, the share of correct answered questions is showed. On average respondents answered 59.52% of the questions correctly. At least one respondent answered none of the questions correctly and at least one respondent answered 90% of the questions correctly.

Table 4.4 Descriptive statistics of the nutritional knowledge

Variable	N	Mean	Std. Dev.	Min	Max
Nutritional knowledge	612	.357	.2154036	-.3	.85
% correct answers	612	.5952	.1701725	.025	.9

Note: Nutritional knowledge is the average score (ranging between -1 and 1) of 40 knowledge questions on nutrition. The percentage of correct answers is the total amount of correct answered questions divided by the total amount of questions.

Table 4.5 shows the household characteristics. On average, 54.74% of the respondents produced their own vegetables and fruits for home consumption and 43.30% raised their own livestock for home consumption.

Table 4.5 Descriptive statistics of the household characteristics

Variable	N	Mean	Std. Dev.	Min	Max
Home production vegetables *(1=yes)*	612	.5474	.4981567	0	1
Home raise livestock *(1=yes)*	612	.4330	.4958969	0	1

Table 4.6 shows the main activity of the respondents. Self-employed in agriculture represents the largest activity among the respondents (33.01%), followed by retired (18.95%) and self-employed in non-agriculture (12.91%).

In many previous studies on the amount of food consumed out of home it is shown that an important factor in the model explaining the amount of food consumed out of home is if the respondent is employed or unemployed. As discussed in the previous chapter, someone who is employed is expected to consume more food out of home. Therefore, the variable main activity is used to calculate the percentage of (un)employed respondents. Adding unpaid housework, looking for work, retired, and unable to work, the amount of unemployed respondents equals 142 (23.20%). 466 respondents (76.14%) indicated that they were committed to paid work, as is listed in table 4.7. Of the 466 working respondents, 60.30% were self-employed.

Table 4.6 Main activity of the respondents

Main Activity	Freq.	Percent	Cum.
Public sector employee	70	11.44	11.44
Self-employed in agriculture (running own or family business)	202	33.01	44.44
Self-employed in non-agriculture (running own or family business)	79	12.91	57.35
Employed at private company/NGO	56	9.15	66.50
Non-agricultural daily labourer	49	8.01	74.51
Agricultural daily labourer	9	1.47	75.98
Student	1	0.16	76.14
Unpaid housework	15	2.45	78.59
Looking for work	4	0.65	79.25
Retired	116	18.95	98.20
Unable to work (sick, old, other)	7	1.14	99.35
Other (specify)	4	0.65	100.00
Total	**612**	**100.00**	

Table 4.7 lists the summary statistics of the other components of the time constraint variable; employment status of the spouse, travel time to work or school, the household size and the household composition (share of preschool age children).

Next to the employment status of the respondent, also the employment status of the spouse is calculated. 73.37% of the 612 spouses were employed. Furthermore, it took the respondents on average 24 minutes to reach work or school. The minimum value of 0 indicates at least one respondent does not face travel time to work or school, which could imply that the respondent works from home. The maximum of 120 minutes indicates that at least one respondent travelled two hours to work or school. And on average, the household size equals 4.6 household members and the share of preschool age children corresponds to 16.04%.

The number of respondents for the variable travel time to work or school is much lower compared to the other variables. Less respondents answered this question because the related survey question was part of the section on food consumed out of home. Since only respondents who consumed food out of home in the last 7 days answered these questions on food consumed out of home, the number of respondents is much lower compared to the total sample size.

Table 4.7 Descriptive statistics time constraint

Variable	N	Mean	Std. Dev.	Min	Max
Employment *(1=yes)*	612	.7614	.4265531	0	1
Employment spouse *(1=yes)*	612	.7337	.4424056	0	1
Travel time to work/school	200	23.72	17.12272	0	120
Household size	612	4.63	1.554678	2	10
Household composition	612	.1604	.1564754	0	.5714

Note: household composition equals the share of preschool age children of the total household size. Preschool age children are children below an age of 6.

Table 4.8 provides the distribution of the total income of the household. The largest group, representing 16.67% of the total sample population, earns more than 20 million VND per month. 15.69% of the respondents indicated their household earns an income between 9 and 10.9 million VND, while 13.40% indicated that their household earns less than 3 million VND.

Table 4.8 Distribution of the income

Income	Freq.	Percent	Cum.
1) Less than 3	82	13.40	13.40
2) 3 – 4.9	57	9.31	22.71
3) 5 – 6.9	71	11.60	34.31
4) 7 – 8.9	58	9.48	43.79
5) 9 – 10.9	96	15.69	59.48
6) 11 – 12.9	33	5.39	64.87
7) 13 – 14.9	26	4.25	69.12
8) 15 - 16.9	51	8.33	77.45
9) 17 - 19.9	36	5.88	83.33
10) More than 20	102	16.67	100.00
Total	**612**	**100.00**	

Note: income class is calculated as household monthly total income, in million VND

In the empirical analysis, the income is included as dummy variable. In total three income classes are defined. The low income class represents households with an income lower than 7 million VND, the middle income class represents households with an income lower than 13 million VND, and the high income class represents households with an income higher than 13 million VND. Table 4.9 shows the descriptive statistics of the income classes. 34.31% of the respondents indicated that their household income was below 7 million VND. 30.56% of the respondents indicated that their household income was below 13 million VND, and 35.13% of the respondents indicated that their household income was larger than 13 million VND.

Table 4.9 Descriptive statistics of the income classes

Variable	N	Mean	Std. Dev.	Min	Max
Low income class	612	.3431	.4751452	0	1
Middle income class	612	.3056	.4610191	0	1
High income class	612	.3513	.4777692	0	1

Note: low income class represents the households with an income below 7 million VND, middle income class represents the households with an income between 7 million VND and 13 million VND, and the high income class represents the households with an income higher than 13 million VND. Income is calculated as household monthly total income, in million VND

Descriptive Statistics Dependent Variables

The two defined dependent variables of the model are a dummy variable for food consumed out of home yes or no and the continuous variable for the amount of food consumed out of home. Below the descriptive statistics for both variables are portrayed. The amount of food consumed out of home is calculated in two ways; 1) the total expenditures of food consumed out of home and 2) the amount of meals consumed out of home.

Table 4.10 Descriptive statistics dependent variables

Variable	N	Mean	Std. Dev.	Min	Max
Food consumed OH *(1=yes)*	612	.4248	.4947225	0	1
Expenditures OH	214	432.089	698.0017	0	5000
Extreme values excluded	*200*	*329.585*	*315.7598*	*10*	*2000*
Meals consumed OH	213	4.93	3.212552	0	30
Extreme values excluded	*200*	*4.87*	*2.709888*	*1*	*14*

Note: food consumed out of home indicates if the respondent consumed any ready- made food out of home in the last 7 days. Expenditures of food consumed out of home is calculated for the last 7 days in VND (x1000). The meals consumed OH represents the total amount of meals consumed out of home in the last 7 days.

Table 4.10 shows that of the 612 respondents, 260 respondents (42,84%) consumed food out of home in the last 7 days. Only 214 respondents of the 260 respondents who indicated they consumed food out of home answered all the question about the amount of food consumed out of home. A reason why not all respondents answered all questions could be that this was one of the last parts of the survey, respondents could have been tired of the long survey.

Of the respondents who did answer all questions related to the food consumption out of home, their average total expenditures of food consumed out of home equalled 432.089 VND. Figures 4.1 shows that the expenditures of food consumed out of home consist of a few extreme values. A value is indicated extreme in case it has a value of 0 or higher than 2000. Respondent(s) indicating their food expenditures of food consumed out of home at 0 means that they did not consume food out of home in the last 7 days and are therefore not part of this sub-sample of people consuming food out of home. Without the extreme values, on average respondents consumed 329.585 VDN on food consumed out of home in the last seven days.

On average, respondents consumed food 4.93 times out of home in the last seven days. The minimum value of the meals consumed out of home in the last seven days is 0, this means that at least one respondent did not eat out of home in the last week, and therefore 0 is indicated as an extreme value. The maximum value of 30 indicates that at least one respondent ate 30 meals out of home the last 7 days. This means that this respondent consumed food on average 4.3 meals out of home a day. Looking at the boxplot of this variable (fig 4.2), it shows that both the value 30 and the value 21 are two extreme values. Without the extreme values 0, 21, and 30, the average amount of meals consumed out of home by the respondents equalled 4.87.
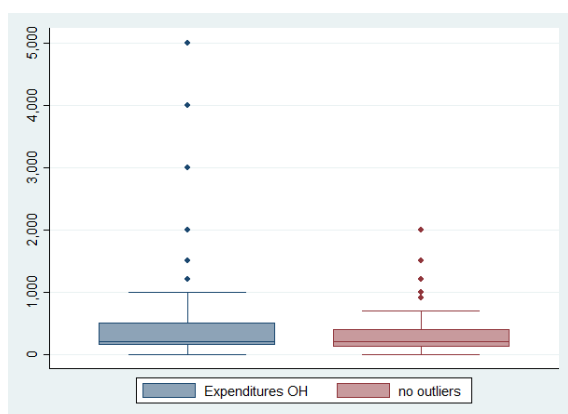
Fig 4.1 Boxplot of the *total expenditures* of food consumed out of home with and without outliers
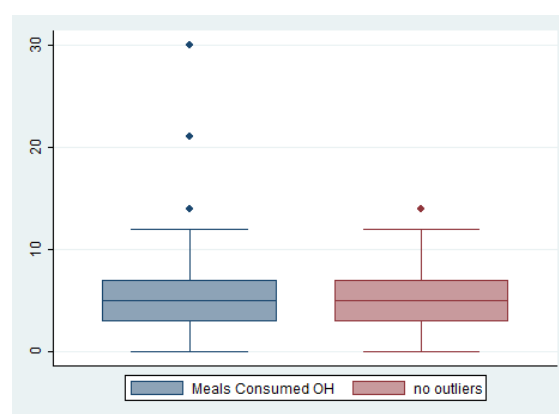
Fig 4.2 Boxplot of the *amount of meals* food consumed OH with and without outliers

Table 4.11 zooms in on the regional distribution of the respondents who consumed food out of home in the last 7 days. As shown, in the urban area most people consumed food out of home. 120 out of the 194 respondents (61.86%) mentioned they consumed food out of home. In the semi-urban region, 114 out of the 203 respondents (56.16%) consumed food out of home and in the rural area only 26 out of the 213 respondents (12.21%) consumed food out of home.

Table 4.11 Division food consumed out of home in the last 7 days per region

Food consumed OH	Region			
	Urban	Semi-urban	Rural	Total
Yes	120	114	26	260
No	74	89	187	350
Total	194	203	213	610

The descriptive statistics of the expenditures of food consumed out of home in the last seven days per region are shown in table 4.12. The average total expenditure on food consumed out of home was highest in the urban region. In the urban region, respondents spent on average 441.044 VND in the last 7 days on food consumed out of home. Respondents living in the rural region spent least on food consumed out of home, only 211.235 VND in the last 7 days. Respondents living in the semi-urban region spent 260.118 VND on food consumed out of home in the last 7 days.

Table 4.12 Descriptive statistics *expenditures* of food consumed OH, per region (excluding extreme values)

Variable	N	Mean	Std. Dev.	Min	Max
Urban	91	441.044	384.0475	30	2000
Semi-urban	93	260.118	266.8359	10	1500
Rural	17	211.235	248.6432	30	1000

The descriptive statistic of the amount of meals consumed out of home in the last seven days per region are shown in table 4.13. On average in the semi-urban region respondents consumed the most meals out of home, followed by the urban region. In the semi-urban area respondent consumed 5.24 meals out of home in the last 7 day. In the urban region the average was 4.84 meals and in the rural area 2.94 meals. The maximum amount of meals consumed out of home (excluding extreme values) was highest in the urban area, namely 14 meals in the last seven days. In the rural area, the maximum was lowest among the three regions, with 10 meals.

Table 4.13 Descriptive statistics *amount of meals* consumed OH, per region (excluding extreme values)

Variable	N	Mean	Std. Dev.	Min	Max
Urban	90	4.84	3.100964	1	14
Semi-urban	93	5.24	2.118233	1	12
Rural	17	2.94	2.703484	1	10

4.1.3 Basic Characteristics of the Qualitative Results

In total I conducted 21 semi-structured interviews. The sample differs from the quantitative data, so the two are analysed separately. Of the 21 interviews, 10 respondents were male, 9 female, and 2 were a couple (female and male). The respondents are a mix of working people, students, and people who are retired. 12 respondents mentioned that they work, 7 of the respondents are students, and 2 are retired.

Most of the interviews (18) took place in the Cầu Giấy district in Hanoi. Only three interviews took place in Đông Anh, the semi-urban district. Due to logistic reasons, it was unfortunately not possible to conduct interviews in Mộc Châu, the rural region.

The time of the interviews differed as well (7.30-9.00 (breakfast), 9.30-11.30 (coffee time), 11.30-13.30 (lunch), and 18.30-20.30(dinner)), due to the expectation that respondents have different reasons to eat out and different food preferences at different moments of time (Khan and Hackler, 1981).

It should be taken into account that all the respondents participating in the interviews were eating out at the moment the interview took place. The sample does not include people who are only eating at home.

4.2 Determinants of the Choice to Consume Food Out of Home

The following section presents the results for the research question of this thesis: "*What determines people's decision to consume food out of home, and what determines people's preference of the frequency of food consumption out of home in rural, semi-urban, and urban areas of Northern Vietnam?*" The research question is answered by Cragg's Double-Hurdle Participation model. First the results of the decision to consume food are presented, followed by the results of the amount of food consumed out of home.

4.2.1 The Decision to Consumed Food Out of Home

The first part of the research question is studied by the Probit model. The independent variables which are included in the model are explained in the previous two chapters. However, the variable *travel time to work* is replaced by the dummy variable *employed outside*. Since the variable of travel time to work only consists of information of the respondents who answered the section on food consumed out of home, the variable contains a lot of missing data. To overcome this problem, a proxy variable is created, employed outside. If a respondent is employed outside the home this could imply that the respondent needs to travel to work. Table 4.14 shows the small positive correlation between travel time to work and employed outside. Hence, it is expected that people who are employed outside the home spend more time traveling to their work or school. The proxy variable employed outside is included in the Probit model.

Table 4.14 Correlation travel time to work and employed outside the home

	Travel time to work	Employed outside
Travel time to work	1.0000	
Employed outside	0.1316**	1.0000
	(0.0420)	

*Note: ** p<0.05*

The following table (table 4.15) provides the output of the Probit model analysis. As the output of the Wald test shows (to detect heteroscedasticity), the null hypothesis for homoscedasticity is rejected ($p<0.05$) and therefore heteroscedasticity is identified. The first tier (Food consumed out of home) in table 4.15 provides the correct output, controlled for heteroscedasticity. The second tier provides the results of the marginal effects.

The results in table 4.15 show that for the Probit model (column 1) only the dummy variable for the lowest income class is significantly different from zero at a 0.01% level. If the income of the household was below 7 million VND, the income level had a negative influence on the decision to consume food out of home. As expected, a low income limits the respondent in the choice to consume food out of home. Out of home food consumpulsion is linked to higher food prices and hence a consumer with a lower income is limited in the decision to consume food out of home (Bonke, 1992).

For the marginal effects (column 2), the education level, the nutritional knowledge, and rural region are found to influence the decision to consume food out of home significantly. Below, I will study the significant effects of these three variables.

In case the respondent completed secondary school or higher, the respondent was 5.43% less likely to consume food out of home. I expected that respondents who completed a higher education level than secondary school would be more likely to eat out of home. However, due to the high percentage of university and postgraduate students of the study population, the reliability of the data of the education variable in this study was already questioned. The effect of the education variable on food consumption out of home are therefore also questionable.

As discussed in section 2.2, the effect of education on the decision to consume food out of home is also studied in previous literature. These previous studies on food consumption out of home showed mixed results of the effect of education on the decision to consume food out of home. Some studies concluded that a higher completed education of the respondent had a significant positive effect on the food consumed out of home (Mihalopoulos and Demoussis, 2001; Stewart and Yen, 2004; Stewart et al., 2005). While other studies did not find a significant effect (Binkley, 2006: McCracken and Brandt, 1987). And some studies did not include the education level in their model (Nayga and Capps, 1994; Prochaska and Schrimper, 1973). Due to mixed outcomes of the education variable among various studies, the effect of education on food consumed out of home should be studied in more detail to understand how the education level of the respondent affects the decision to consume food out of home.

The nutritional knowledge (share of correct provided answers to 40 specific questions about nutritional characteristics of foods) of the respondent had a positive effect on the decision to consume food out of home. If the respondent answered one extra question correct, the chance that the respondent consumed food out of home increased with 11.3%. Binkley (2006) expected that nutritional knowledge negatively influenced the decision to consume food out of home, due to unhealthy food options when eating out of home. Binkley claimed that eating out of home is associated with unhealthier food choices, therefore

people with a higher nutritional knowledge would consume less food out of home. However, the fact that consumers consume less healthy food option when eating out of home is not valid for the case study of this thesis. In Vietnam, Lachat et al. (2009) concluded that eating out of home added a number of desirable foods and nutrients, which led to a higher dietary diversity. Fruits and vegetables were the main contributions of the out of home foods in their study. Hence, due to the healthy available food options when consuming food out of home, respondents with a higher nutritional knowledge might decide to consume (healthy) food out of home.

Living in the rural region had a negative effect on the decision to consume food out of home by the respondent. Respondents living in the rural region, Mộc Châu, consumed 34% less food out of home compared to respondents who did not live in the rural region. Another study conducted in Vietnam detected the same negative effect of living in a rural region and food consumption out of home (Lachat et al., 2011). What could explain this negative effect, is the lower availability of street vendors in rural regions compared to the urban region. Previous studies linked the higher intake of food consumed out of home in urban regions to the growth of the informal sector in urban regions, including the availability of street vendors (Dawson and Canet, 1991). This is also what I witnessed while driving through Cầu Giấy, the urban region. Everywhere you looked, you would find several street vendors or small informal restaurants. In the rural region, the density of street vendors was much lower compared to the urban region, which could have led to the negative effect of living in the rural region and the decision to consume food out of home.

Table 4.15 Probit model: food consumed *out of home*

Independent variables	(1) Food consumed out of home	(2) Marginal Effects
Age	-0.0613	-0.00151
	(0.0748)	(0.000996)
Gender *(1=male)*	0.185	0.0112
	(0.976)	(0.0235)
Education level higher than secondary *(1=yes)*	-1.529	-0.0543**
	(1.637)	(0.0216)
Nutritional knowledge	2.608	0.113*
	(3.322)	(0.0633)
Employment *(1=yes)*	-9.827	-0.197
	(15.02)	(0.252)
Employment status spouse *(1=yes)*	21.14	0.566
	(34.42)	(0.699)
Employed away from home *(1=yes)*	9.770	0.180
	(14.60)	(0.239)
Household size	0.366	0.00798
	(0.445)	(0.00508)
Household composition	1.078	0.0167
	(2.722)	(0.0702)
Home production of vegetables/fruits *(1=yes)*	-0.866	-0.103
	(1.129)	(0.0752)
Home raise of livestock *(1=yes)*	-0.0401	0.0647
	(0.434)	(0.0580)
Low income class *(1=yes)*	-106,604***	-2,440
	(3,666)	(2,493)
Middle income class *(1=yes)*	0.149	0.110
	(0.793)	(0.0981)
High income class *(1=yes) (Omitted)*	-	-
i.Region		
Semi-urban	0.362	0.00857
	(0.649)	(0.0224)
Rural	-22.88	-0.340***
	(34.72)	(0.0535)
Constant	2.344	
	(3.717)	
N	612	612

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Wald test of lnsigma2=0: chi2(15)=5555.60, Prob > chi2 = 0.0000

4.2.2 The Amount of Food Consumed Out of Home

The second part of the research question focussing on the amount of ready-made food consumed out of home is analysed using the Truncated regression technique. The number of observations for the truncated regression is much lower compared to the Probit model. The study population of the second part of the research question consisted only of people who consumed food out of home, while the study population of the first part of the research question consisted of all the respondents who completed the survey.

The independent variables are the same as for the Probit model, apart from the independent variable travel time to work. Travel time to work is included in the model instead of the proxy variable self-employed, which was incorporated in the Probit model.

Due to heteroscedasticity, the regression included robust standard errors. A VIF test was executed to test for multicollinearity. All the variables had a value between 1 and 10, which indicates the independent variables in the regression model do not correlate. The largest variance inflation factor was 2.77, so there is even very little multicollinearity in the data.

The expenditures of food consumed out of home
The regression results in table 4.16 show the truncated regression results and the marginal effects. The following independent variables are all significantly different from zero: gender, nutritional knowledge, home production of vegetables and/or fruits, and the low and middle income classes. Below, I will discuss the different significant independent variables.

Gender had a negative effect ($p<0.05$) on the amount of food consumed out of home. Meaning that being a man had a negative effect on the amount of food consumed out of home. The marginal effect shows that men spent 126.100 VND less on food consumed out of home compared to women. This is not what was expected from previous studies. A previous study in Vietnam did not find a difference between men and women, while a study in the USA showed that men eat more food out of home compared to women (Lachat et al., 2011; Stewart et al., 2005). A reason to justify the negative effect of gender on the expenditures of food consumed out of home could be that the reason given in other studies is not valid in this sample population. Women used to consume less food out of home due to the fact that women more often than men are not participating in the labour market and hence spend more time at home. Redman (1980) concluded that when women participate in the labour market, they consume more food out of home. Of the respondents, 76.41% of the women were employed and 73.85% of the men. Hence, the reason women spend less money on food consumed out of home since they stay more at home is in this study population not valid.

Nutritional knowledge is negatively correlated with the expenditures of food consumed out of home at a 0.1% level. Respondents who answered one extra question correct, spent 240.600 VND less on food out of home. Previous studies detected a positive relation between nutritional knowledge and food consumed out of home, especially healthy food options (Binkley, 2006). In Vietnam, consumers often consume the traditional food options, which are considered as healthy, when eating out of home (Lachat et al., 2009). Respondents with a higher nutritional knowledge might consume more of these traditional food options, since they are considered healthy. The traditional food options are cheaper compared to the western, less healthy, food options like McDonalds, Starbucks, or Bubble Tea. The lower costs for healthy food options could possibly lead to lower expenditures of food consumed out of home by respondents with a higher nutritional knowledge than respondents with a lower nutritional knowledge, who consume less healthy food options.

The variable home production of vegetables and/or fruits is negatively correlated with the expenditures of ready-made food at a 0.1% level. If a household produced its own vegetables and/or fruits, the respondent spent 187.000 VND less on food consumed out of home. This is in line with the expectations. If a household already grows its own fruits and vegetables, the need to buy vegetables and fruits is less present compared to households who do not produce their own vegetables or fruits. Part of the ingredients to prepare a meal are present so costs to prepare a meal are lower, which could make it more convenient for the respondent to consume more meals at home.

The output in column 1 and 2 also show that when the household's income was below 7 million VND or below 13 million VND, the income had a significant negative effect on the expenditures of food consumed out of home by the respondent. If the household's income was below 7 million VND, the respondent spent 340.000 VND less on food consumed out of home. If the household's income of a respondent was below 13 million VND, the respondent spent 105.100 VND less on food consumed out of home. The effect of the income was larger for respondents of who the household's income was less than 7 million VND, compared to respondents of who the household's income was less than 13 million VND. The expectation was that a higher income would lead to more expenditures on food consumed out of home (Bonke, 1992). The results showed that a consumer with a lower income consumed less food out of home.

During the semi-structured interviews, a respondent (respondent #20) also argued that an increase in the household's income led to an increase of food consumed out of home. She mentioned now people have more money to spend, they increased their expenditures on food consumption and especially their expenditures on ready-made food. She looked back at the Vietnam war and the difficult times after the war, in which there was often not enough to eat. Due to economic growth, she mentioned there is now enough money available to buy food. She still considered the consumption of food out of home as a luxury. Especially to treat her grandchildren. She mentioned it became normal to give your (grand)child some pocket money so they could buy a snack after school. Before, it was financially not possible to do this.

The frequency of food consumed out of home
The output of the frequency of food consumed out of home is shown in column 3 and 4, representing the truncated regression results and the marginal effects. Column 3 and 4 show that of the independent variables higher than secondary education (0.05%), the employment status of the spouse (0.1%), and the rural region (0.01%) are significantly different from zero.

Respondents of who the highest completed education level was higher than secondary school consumed 0.9 meals less out of home. Previous studies did not show a negative effect of the education level on the amount of food consumed out of home. However, as is mentioned in the hypothesis and in sub-section 4.2.1, the education variable has a few limitations; different studies concluded mixed outcomes of the education variable, and the data on education in this thesis was already questioned due to high percentage of university and postgraduate students in the study population. More research has to be completed to understand the effect of the education level on the preference to consume food out of home.

In case the spouse of the respondent was employed, the respondent consumed more food out of home. If the spouse was employed, the respondent consumed 0.9 meals more out of home. This is in line with the expectations. If the spouse is employed, the spouse spends less time during the day at home and hence might consume more food out of home. This could also affect the amount of food consumed by the respondent, due to the scale economies associated with household meal preparation. If the spouse is not at home, it could be convenient for the respondent to also quickly grab a ready-made meal out of home instead of preparing a meal just for him- or herself. Moreover, if the spouse is employed, this will increase the household's income. So, there will be more money available for the respondent to consume food out of home. Also, if the spouse spends less time at home during the day the available time to prepare a meal at home will decrease, which leads to more consumption of food out of home (Bonke, 1992; Nayga and Capps, 1994).

Living in the rural region had a strong significant negative effect on the amount of meals consumed out of home. Respondents living in the rural region consumed 2.3 meals less out of home compared to respondents who did not live in the rural region. This is in line with the expectation for this region. In a remote area, the density of outlet options to consume food out of home is lower, and hence respondents might choose to prepare a meal at home instead of consuming a meal out of home.

Table 4.16 Truncated regression: Expenditures and the amount of food consumed out of home

Independent Variables	(1) Expenditures of food consumed *out of home*	(2) Marginal effects	(3) Amount of meals consumed *out of home*	(4) Marginal effects
Age	1.833	0.405	0.00138	0.00106
	(7.842)	(1.774)	(0.0255)	(0.0196)
Gender *(1=male)*	-571.5	-126.1**	-0.809	-0.622
	(378.8)	(63.62)	(0.547)	(0.417)
Education level higher than secondary	14.63	3.229	-1.172*	-0.901*
(1=yes)	(276.0)	(60.83)	(0.621)	(0.462)
Nutritional knowledge	-1,090	-240.6*	2.114	1.626
	(674.1)	(138.7)	(1.800)	(1.360)
Employment *(1=yes)*	283.2	62.52	-0.0878	-0.0675
	(277.6)	(68.70)	(0.680)	(0.523)
Employment spouse *(1=yes)*	252.0	55.62	1.159*	0.891*
	(189.8)	(42.60)	(0.624)	(0.467)
Travel time	9.685	2.138	0.00856	0.00658
	(6.644)	(1.328)	(0.0129)	(0.0100)
Household size	9.648	2.130	0.248	0.191
	(71.38)	(15.54)	(0.175)	(0.134)
Household composition	-305.5	-67.44	-1.835	-1.411
	(795.0)	(170.5)	(1.770)	(1.354)
Home production vegetables/fruits *(1=yes)*	-847.4*	-187.0***	-0.199	-0.153
	(443.2)	(63.72)	(0.591)	(0.455)
Home raise livestock *(1=yes)*	147.9	32.65	-0.00886	-0.00681
	(321.1)	(69.37)	(0.612)	(0.471)
Low income class *(1=yes)*	-1,540*	-340.0***	-0.895	-0.688
	(812.9)	(112.0)	(0.853)	(0.652)
Middle income class *(1=yes)*	-476.3	-105.1**	0.0431	0.0331
	(308.9)	(52.56)	(0.511)	(0.393)
High income class *(1=yes)* *(Omitted)*	-	-	-	-
i.Region				
Semi-urban	-390.0	-82.90	-0.0273	-0.0218
	(278.2)	(52.42)	(0.632)	(0.504)
Rural	-260.1	-58.65	-3.607**	-2.276***
	(688.1)	(140.9)	(1.622)	(0.809)
Constant	50.40		2.399	
	(678.4)		(2.257)	
Observations	200	200	200	200

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.3 Consumer's Food Preferences when Eating Out of Home

As discussed in this thesis, food preferences of consumers are very relevant when analysing the preference to consume food out of home. In this section, the most and second most important food characteristic and factors influencing the food preference when eating out will be addressed. Thereafter, the food preference scores when eating out of home and at home will be presented.

4.3.1 Food Characteristics

The most and second most important food characteristic of the respondents are listen in table 4.17 and 4.18. Safety was most frequent indicated as the most important food characteristic. 40.44% of the respondents listed the safety of the food as the most important food characteristic. Healthfulness comes at the second place, with 36.84% of the respondents indicating healthfulness as most important food characteristic. Taste was least often indicated as most important food characteristic (4.02%), when leaving out the respondents selecting "don't know" as most important.

As second most important food characteristic, 29.64% of the respondents chose safety. 26.45% of the respondents indicated healthfulness and nutrition as second most important food characteristic. Again, taste was least often picked as second most important food characteristic.

Table 4.17 Most important food characteristic

Most important factor	Freq.	Percent	Cum.
Taste	29	4.02	4.02
Price	32	4.43	8.45
Healthfulness	266	36.84	45.29
Nutrition	91	12.60	57.89
Safety	292	40.44	98.34
Don't know	12	1.66	100.00
Total	**722**	**100.00**	

Table 4.18 Second most important food characteristic

Second most important factor	Freq.	Percent	Cum.
Taste	46	6.37	6.37
Price	61	8.45	14.82
Healthfulness	191	26.45	41.27
Nutrition	191	26.45	67.73
Safety	214	29.64	97.37
Don't know	19	2.63	100.00
Total	**722**	**100.00**	

Also in the qualitative interviews, the respondents were asked if they base their food choice on healthy beliefs or if they are not concerned about healthy food options. Contradicting to the quantitative results, most respondents of the semi-structured interviews admitted that healthy food options are not very important to them. Although a balanced diet is important to 4 respondents. Respondent #21 stated that when eating dinner at home with family, he eats a balanced meal consisting of rice, vegetables, and some meat, chicken, or fish. He considered this meal as a healthy meal. Something which he is less concerned about when eating out of home.

4.3.2 Factors Influencing the Food Preference

Respondents of the consumer behaviour survey were asked to name their most and second most important factor influencing their decision to consume food out of home. Table 4.19 and 4.20 show the results of the most and second most important factors. Quality was selected most often as most and second most important factor influencing food preferences when eating out of home. 48,18% of the respondents indicated that quality of the food is most important to them and 19.18% of the respondents indicated quality as second most important factor. The quality of the food was also often indicated as an important factor by the respondents of the semi-structured interviews. 10 out of the 21 respondents addressed the importance of the quality of the food. Respondents stated that they base their choice of the outlet and the choice of the food on the quality of the food that is served. Two of the respondents were concerned about the quality of the ready-made food they buy out of home. Respondent #13 stated that she never knows how the food is prepared and where it comes from. She prefers to cook herself, so she has control over the food she is eating. In this case the quality of the food is very close related to the safety of the food.

In the consumer behaviour survey food safety was also often selected as important factor influencing the food preference of the respondent. 22.67% of the respondents indicated that the safety of the food was the most important factor and 18.37% of the respondents selected food safety as second most important factor.

Table 4.19 Most important factors influencing food preference when eating out of home

Most important factor	Freq.	Percent	Cum.
Quality	119	48.18	48.18
Price	6	2.43	50.61
Good custom service by the outlet staff	14	5.67	56.28
Quickly served food	8	3.24	59.51
Cleanliness and layout of the vendor	6	2.43	61.94
Healthy food products	13	5.26	67.21
Safe food	56	22.67	89.88
Variety of food	8	3.24	93.12
Freshness of food	5	2.02	95.14
Meal is tasty	7	2.83	97.98
Location on the way to work / home	1	0.40	98.38
Location close to my home/work	1	0.40	98.79
Social relationship	1	0.40	99.19
Appearance of the food itself	2	0.81	100.00
Total	**247**	**100.00**	

Table 4.20 Second most important factors influencing food preference when eating out of home

Second most important factor	Freq.	Percent	Cum.
Quality	47	19.18	19.18
Price	22	8.98	28.16
Good custom service by the outlet staff	30	12.24	40.41
Quickly served food	11	4.49	44.90
Cleanliness and layout of the vendor	23	9.39	54.29
Reputation of the vendor	5	2.04	56.33
Healthy food products	22	8.98	65.31
Safe food	45	18.37	83.67
Variety of food	12	4.90	88.57
Freshness of the food	4	1.63	90.20
Meal is tasty	16	6.53	96.73
Location close to my home/work	4	1.63	98.37
Social relationship	1	0.41	98.78
Appearance of the food itself	3	1.22	100.00
Total	**245**	**100.00**	

The importance of food safety is an important issue for the respondents for both the general food characteristics and when consuming food out of home. Therefore, I would like to elaborate more on this issue by studying the food safety concerns when eating out of home. Respondents were asked to indicate, on a scale of 1 to 5, how concerned they are about the food safety when consuming food out of home. As table 4.21 shows, most respondents (42.22%) indicated that they were fairly concerned about the food safety when they consumed food out of home. Only 3.7% of the respondents indicated that they are totally not concerned about the food safety when consuming food out of home.

Table 4.21 Food safety concerns when consuming food out of home

Food safety concerns	Freq.	Percent	Cum.
Totally not concerned	10	3.70	3.70
Not so concerned	28	10.37	14.07
Neutral	80	29.63	43.70
Fairly concerned	114	42.22	85.93
Totally concerned	38	14.07	100.00
Total	**270**	**100.00**	

During the semi-structured interviews, I also asked about the factors influencing the decision of the respondent to consume a specific ready-made meal out of home. A factor which was often named as an important factor in the decision making process to decide what to eat is the mood of the respondent. If respondents were asked how they decided to eat the ready-made meal they were consuming, respondents nearly all the times replied that they felt like eating that particular meal. In this thesis, I try to analyse what influences the mood of the respondent. Therefore, respondents were challenged to described what determined their mood. A few people found it difficult to answer that question, but others named the taste of the food, quality of the food, weather circumstances, or the familiarity of the food as factors which influenced their appetite for a specific dish. Mainly the taste of the food was linked to the mood. The taste of the food is important to 7 of the 21 respondents.

Moreover, I would also like to elaborate on the moment of eating out of home of the respondents. Table 4.22 shows the moment of eating out of home of the respondents. Most of the respondents (36.94%) consumed their meals in the early morning, followed by lunch (27.99%). Respondents indicated that they nearly never consumed a meal out of home in the afternoon. The low number is probably affected by the fact that 13:00 until 16:00 falls under working hours and therefore employed respondents are busy working during these hours.

Table 4.22 Moment of eating out of home

Moment of eating OH	Freq.	Percent	Cum.
Early morning (before 8:00)	99	36.94	36.94
Morning (8:00-11:00)	6	2.24	39.18
Lunch (11:00-13:00)	75	27.99	67.16
Afternoon (13:00-16:00)	1	0.37	67.54
Late afternoon (16:30-19:00)	10	3.73	71.27
Evening (after 19:00)	10	3.73	75.00
Early morning + Lunch	25	9.33	84.33
Lunch + Late afternoon	8	2.99	87.31
Lunch + Evening	8	2.99	90.30
No regular time	26	9.70	100.00
Total	**268**	**100.00**	

During the semi-structured interviews, I also asked when the interviewee would eat out most often. Most of the respondents mentioned that they eat out for breakfast (12) and lunch (13). Only a few of the respondents ate out for dinner (4). Dinner is seen as a time of the day which you should spend with family. After work or school, people go home to have dinner with their family instead of eating in a restaurant.

4.3.3 Food Preference
In chapter 2, the different factors of the food preference of the consumer are defined. The food preference is measured both for when the consumer consumes food out of home and when the consumer consumes food at home. Table 4.23 shows the descriptive statistics of the food preference when eating out of home, while table 4.24 shows the descriptive statistics of the food preference when eating at home. The descriptive statistics of the food preference when eating out of home consist of the respondents who consumed food out of home in the last 7 days, while the descriptive statistics of the food preferences when eating at home consist of the whole study population. Therefore, the sample size for the descriptive statistics of the food preferences when eating out of home is much lower compared to the sample size of the descriptive statistics of the food preference when eating at home.

To calculate the food preference of the respondent, respondents were asked to evaluate the importance of the different components of food preferences (presented in fig. 2.4). They could choose between scores ranged from 1-5, in which 5 represented the highest score of importance and 1 the lowest. For the food preference when eating out of home, the intrinsic factor – the appeal of food –, consisting of the appearance, taste, quality, safety, and presentation of the food, had the highest average score of 4.11, followed by the extrinsic factor (environment (good service), reputation, cleanliness, variety of food), with an average score of 3.91. The socioeconomic factor (recommended by friend / dietitian, advertised in the media, special offer of the vendor, clientelism) scored lowest of all, with an average score of 2.95.

Table 4.23 Descriptive statistics of the food preferences when eating *out of home*

Variable	N	Mean	Std. Dev.	Min	Max
Intrinsic OH	241	4.11	.6271232	1	5
Extrinsic OH	241	3.91	.6541667	1	5
Socioeconomic OH	241	2.95	.6991511	1	5
Convenience OH	241	3.65	.7373867	1	5

Note: score between 1-5 ranging the importance of intrinsic, extrinsic, socioeconomic, and convenience factors when consuming food out of home

Respondents of the semi-structured interviews often indicated convenience as an important factor when eating out of home. First the decision to eat where (mainly related to the convenient location of an outlet) and second what to eat (something which is easily and fast prepared) influence respondents when eating out of home. 15 of the 21 respondents named the importance of convenience, which makes it the most important factor influencing people's decision to eat at a specific outlet for the qualitative results. Saving time and the convenience of the location was mentioned by respondent #13. She has to attend classes in the morning, so instead of cooking herself – time –, she will eat breakfast on her way to the university – location.

Table 4.24 shows the results of the scores of importance of the different components influencing food preferences when eating at home. The intrinsic factor scored again the highest score, followed by the convenience factor, respectively an average score of 3.96 and 3.48. The socioeconomic factor scored lowest, with an average score of 3.17.

Table 4.24 Descriptive statistics of the food preferences when eating *at home*

Variable	N	Mean	Std. Dev.	Min	Max
Intrinsic general	719	3.96	.5438944	1	5
Extrinsic general	719	3.40	.6749223	1	5
Socioeconomic general	719	3.17	.7887	1	5
Convenience general	719	3.48	.7742112	1	5

Note: score between 1-5 ranging the importance of intrinsic, extrinsic, socioeconomic, and convenience factors when consuming food at home

Table 4.25 shows the correlations between the out of home food consumption preferences and the food preferences when eating at home, to test to what extend the food preferences when eating out of home and food preferences when eating at home are linked to each other. The correlation table shows that all the four factors for food consumed out of home and at home are all positively correlated at a 0.01% level, however the correlations are all not very strong. The socioeconomic factor for out of home food consumption and food consumption at home is most strongly correlated, while the extrinsic factor is least strongly correlated.

Table 4.25 Correlation table food preferences

Factors	Intrinsic OH	Extrinsic OH	Socioeconomic OH	Convenience OH
Intrinsic AH	0.2894***			
Extrinsic AH		0.2294***		
Socioeconomic AH			0.3938***	
Convenience AH				0.3352***

*Note: *** $p<0.01$*

Chapter 5 Discussion and Limitations

In this chapter, the different elements of this thesis – *the theoretical framework, the data and methodological design, and the empirical results* – will be discussed, and limitations of these elements will be highlighted.

5.1 Theoretical Framework

In this thesis, traditional economic theories were used to explain consumer preferences and behaviour. In chapter 2, it is stated that consumers choose the best available bundle according to their preferences and which they can afford, the question is however if that is always the case. It is assumed that consumers have full access to information and hence they are able to choose their best preferred available bundle. Due to information asymmetry the assumption of full information could be violated. Consumers could have only partial information on products, which limit the consumer to choose its most preferred bundle. Partial information in this case concerns among others information about the nutritional facts of meals, food safety, and/or food quality. This could especially occur in case of eating out, since not all outlet owners provide full information about their products (Stewart, Blisard, and Jolliffe, 2006). This could make people unaware of the difference between different bundles – different meal options. The absence of full information could particularly have large effects on food preferences. In Vietnam, people who are more concerned about food safety consume less food out of home (Lachat et al., 2011). Due to incomplete information about the food safety and quality, the amount and frequency of consuming food out of home could have been affected. Therefore, information asymmetry should be taken into account while interpreting the empirical results.

5.2 Study Set-Up and Survey Design

The data used in this thesis originates from the consumer behaviour survey which is part of the A4NH programme. The consumer behaviour survey targeted people responsible for the household's food purchases and / or responsible for the household's food preparation. This thesis focusses on food consumption out of home and not at home. Since respondents targeted in the consumer behaviour survey are responsible for the household's food preparation, I expect that the selected respondents spent a lot of time at home during the day. This could have had a negative effect on the decision and amount of food consumed out of home as discussed in section 2.2 of this thesis. In the design stage of the survey, this problem was already raised. The initial idea was to tackle the problem by targeting the household member who consumed most food out of home for the section of the survey focussing on food consumption out of home. However, this household member was often not present at the house while the survey was conducted. Lack of budget limited any further steps to reach out to the household members consuming most food out of home.

Future study efforts should centre attention to the set-up of the study. If the central focus point of the study is again to research the household purchases of food consumed at home, budget and time should be available to reach the household members who consume food out of home most often.

Furthermore, due to time limitations, the survey was designed before the finalisation of the empirical strategy of this thesis. After finalising the empirical strategy, I realised the survey design was not completely optimal for the set-up of the empirical strategy. The question about the travel time to work was part of the section about food preferences when consuming food out of home. Only respondents

who actually consumed food out of home in the last 7 days answered the question about the travel time to work, and therefore data was missing for respondents who did not consume food out of home in the last 7 days. The proxy variable self-employed was included in the model of the choice to consume food out of home, as solution for the missing data. When the travel time to work was added to another section of the survey, which was answered by all respondents, the problem of missing data did not occur and the proxy variable self-employed did not have to be included in the model.

5.3 Data Collection

A limitation of the data collection is that the respondents of the three different regions were not interviewed in the same month. Most of the respondents of the semi-urban and rural region were interviewed in July. However, respondents of the urban region were mainly interviewed in September and October. Different weather circumstances could have affected people's preference to consume food out of home or at home differently for the three regions. During the interviews in the rural region heavy rain showers caused inaccessible roads. People could have decided to stay at home during such weather circumstances instead of going to work, which could have influenced the amount of food consumed out of home by the respondents. Future studies should therefore pay attention to the time frame of the execution of the data collection. The qualitative results also highlighted that consumers have different preferences, both what to eat and where to eat, for different weather circumstances. For the analysis of this thesis, the influence of weather circumstances on the preference where to eat, at home or out of home, is important to take into account. When temperatures are very high in the summer months, people are less willing to drive on their motorbike through town to eat some lunch. A respondent of the qualitative interviews named that, due to the hot weather, he consumed ready-made lunch close to his office instead of driving home for lunch.

Next to the location where to eat, the food choice of respondents is also influenced by weather circumstances. As addressed by multiple respondents during the qualitative interviews, when it is very hot, people would consume a different type of meal than when it is cold. Respondent #18 mentioned she prefers rice and green vegetables when the temperatures are high, while she would prefer noodle soup (Phở) when temperatures are lower. The influence of the weather circumstances on the food choice is not relevant for this thesis, but should be taking into account when studying food choices.

To test if there is an influence of seasonal variation and weather circumstances on the amount of food consumed out of home, future studies could repeat the same survey among the same respondents multiple times during the year to compare outcomes of food consumed out of home among various seasons.

5.4 Internal and External Validity of the Study

This thesis is based on common and recognised theories used in various previous case studies on food consumption out of home. Moreover, the collected data suits the empirical strategy of this thesis. This ensures the internal validity of the study. However, as named previously in this chapter, the study population is not optimal to tackle the research question. Optimal for this study would to target the household head instead of the household manager. So, when targeting the household head in future studies, the internal validity can be improved.

A threat to the internal validity of the qualitative results is the biased position of me, the researcher, and my translator. I designed, monitored, and evaluated the semi-structured interviews. Because as

researcher, you are never completely objective, it could have happened that I interpreted the answers of the respondents slightly different than what the respondent actually meant to say. By not instructing my translator on the expected outcomes, I limited the influence of my translator. However, still he could have interpreted both my questions and the answers of respondents differently compared to what was meant.

The reliability of the thesis – the exact replicability of the processes and the results – is secured since the analysis of the empirical results are saved in a do-file, so the results can at any time being replicated.

The study randomly selected households in three districts in Northern Vietnam. The three regions included in this study were not selected randomly. Hence, the results of this study can be generalised for the three selected regions in Northern Vietnam. To a certain extent, the results might be applicable to other regions in Northern Vietnam. However, since context always plays a role, food habits and preferences might differ among different regions. Therefore, future research in other parts of Vietnam is recommended to improve the external validity of this research.

5.5 Analysis of Food Preferences

This thesis studied factors indicating the food preference of the respondent. A lot of previous studies on the decision and amount of out of home food consumption did not study food preference factors or only a few factors (for instance food quality or convenience). The factors included in this thesis are based on the food preference models of different authors and translated into the context of this thesis. The results of the food preference might be useful to better understand the decision making process when someone is eating out of home. However, it should be mentioned that the factors influencing the food preference are open for personal interpretation by the respondents. I expect that especially food quality could have been interpreted in different ways by the respondents. It could be that one respondent considered food quality as a meal which is healthy while another respondent indicate food quality as a meal which is safe, and another respondent can emphasis that a high quality meal should be prepared with expensive high quality ingredients. Even in previous literature the quality of food is defined in various ways. Furst et al. (1996) addressed the issue of different interpretations of food quality by respondents. They mentioned that some of the respondents linked it to price while others linked it to levels of excellence. Blisard, Variyam, and Cromartie (2003) named taste, nutritional content, safety, and convenience as components of food quality. Also in the semi-structured interviews respondents interpreted the food quality in different ways. Some respondents linked food quality to the safety of the food, which was addressed in section 4.3. Other respondents linked the food quality to how crowded an outlet was. Respondent #16 who is a taxi driver, eats lunch every day at a different place, depending on the place he is around lunch time. He picks the outlet which is crowded to make sure that the quality of the food is good. Respondent #6 also pointed out that he looks for crowded places to have lunch. He mentioned that there is probably something wrong with the quality of the food if the place is not crowded. Summarised, personal interpretation of food preference factors by respondents makes it tricky to understand and interpret the results.

This thesis combined quantitative and qualitative results for the analysis of food preferences. As mentioned before, unfortunately due to logistic reasons, I was not allowed to conduct semi-structured interviews in the rural area, Mộc Châu. Hence, the study area of the qualitative results differ from the quantitative results. When interpreting the results of the food preference of the respondents, this should be taken into account.

Chapter 6 Conclusion and Recommendations

The objective of this thesis was to analyse what determines people's preference to consume food out of home in Northern Vietnam. Data of the consumer behaviour survey of 2018 was analysed by the double-hurdle participation model. Additionally, the food preference of consumers was analysed.

The first part of the thesis focussed on the determinants of the decision to consume food out of home. The empirical results show that the decision to consume ready-made meals out of home is determined by the income of the household, the education level and nutritional knowledge of the consumer, and the region. If the household's income is low (below 7 million VND), the consumer is less willing to consume food out of home. In addition, the education level of the consumer negatively influences the decision to consume food out of home. Consumers who completed at least secondary school are less likely to consume food out of home. Moreover, consumers with a higher nutritional knowledge are more likely to consume food out of home. Last, consumers who live in the rural region, Mộc Châu, are less likely to consume food out of home compared to consumers who do not live in a rural region.

The second part of the thesis focussed on the amount of food consumed out of home by the consumer. The amount of food consumed out of home was analysed by the total expenditures of food consumed out of home and the frequency of eating out of home. Both outcome variables showed different results. The expenditures of food consumed out of home is significantly affected by the home production of vegetables and/or fruits, income of the household, gender of the consumer, and nutritional knowledge of the consumer. While the frequency of food consumed out of home by the consumer is significantly influenced by the education level of the consumer, the employment status of the spouse, and the region.

Analysis of the outcome variable expenditures of food consumed out of home indicates a significant negative correlation between home production of vegetables and/or fruits and expenditures of food consumed out of home. This means that in case the consumer produces its own vegetables and/or fruits for home production, the consumer's expenditures of food consumed out of home are lower. Other variables which are negatively correlated with the expenditures of food consumed out of home are the variables for the low and middle income class. Of these two income classes, the low income class negatively affects the expenditures of food consumed out of home strongest. Moreover, the variable gender indicates a significant negative effect on the expenditures of food consumed out of home. This means that the expenditures of food consumed out of home are lower for men than women. This most likely results from a changing role of the women in the household, in which women also participate on the labour market. Last, consumers with a higher nutritional knowledge spend less on food consumed out of home. What could have influenced this negative effect is the health and safety concerns of consumers when eating out of home in Northern Vietnam.

The frequency of eating out of home is negatively affected by the education level of the consumer. In case the consumer completes secondary school or a higher education, the consumer eats less meals out of home. Furthermore, the employment status of the spouse is positively correlated with the frequency of eating out of home. The consumers consume more meals out of home when their spouse is employed. And last, consumers living in Mộc Châu, the rural region, consume less meals out of home compared to consumers who do not live in a rural region.

Summarised, of the different variables of the consumer demand model (the budget set, time constraint, prices, and the preferences), the budget set of the consumer is, as expected, a limiting factor in the preference to consume food out of home. The results do not show a clear impact of the time constraint of the consumer on the preference to consume food out of home. Only the employment status of the spouse influences the amount of food consumed out of home. Furthermore, price differences, captured by the different regions, affect the decision to consume food out of home and affect the frequency of food consumed out of home. Living in the rural region is negatively linked to the decision to consume food out of home and the frequency of out of home food consumption. Last, of the set of variables indicating the preference of the consumer, only the two variables education level of the consumer and the home production of vegetables and/or fruits affect the preference to consume food out of home. The education level is for both the decision and the frequency of eating out of home negatively correlated with the preference to consume food out of home, and the home production of vegetables and/or fruits is negatively linked to the expenditures of food consumed out of home.

In addition, this thesis included an analysis of the food preference of the consumer, which is not common in previous studies on food consumption out of home. Both the quantitative and qualitative results were combined to analyse the food preference of consumer.

Food safety and healthfulness are the most import food characteristics. When eating out of home, the most important factors influencing what to eat are the food quality and the food safety. Also the qualitative results showed that food quality is an important factor in the decision-making process when eating out of home. Moreover, when eating out of home, most consumers are fairly concerned about the food safety of the meals they consume. Furthermore, the different factors where combined into four food preference components; intrinsic, extrinsic, socioeconomic, and convenience. Consumers indicate that the intrinsic component is the most important for both the food preference when eating out of home and eating at home. This means that consumers indicate the appeal of the food as most important factor when deciding what to eat. Contradicting to the quantitative results, the most important factor influencing consumer's food preference of the qualitative interviews is the convenience of food consumed out of home. Both the location of the outlet and the time saving when eating out have an important impact on the choice of outlet and eventually an influence on the food choice.

Another important conclusion from the qualitative results is the importance to understand the influence of the weather on the food preferences of people. Especially since the data collection of the survey as well as the semi-structured interviews took place mainly during the summer months. As people explained in the semi-structured interviews, hot temperatures affect their food preferences.

Furthermore, the moment of eating out of home was analysed. Most often, consumers consume food out of home for breakfast or lunch. Also participants of the semi-structured interviews indicated that breakfast and lunch are the most important meals of the day eaten out of home.

This thesis is one of the first studies investigating the determinants of the decision to consume food out of home in Northern Vietnam, by studying the consumer demand model. Since the study population only consist of households of three (non-random selected) districts, more research is needed to get a better picture of the situation in other parts of Northern Vietnam and the rest of Vietnam. Future research should take into account lessons learned from this study to improve the quality of the results. The two most important suggestions for future research are: to target the right sample population and to collect data in the same period of the year. In the case of the consumer's demand for food consumed out of home, the target group should be the household member responsible for most food consumed out of

home. In addition, it is important to collect the data in the same period of the year to overcome an effect of seasonal weather variation on the decision and amount of food consumed out of home. If data is collected in the same period of the year, it might be interesting to execute a follow-up study in another season, to study seasonal variations. Hereby it is important that the follow-up study uses the same survey and study sample, so data can be compared over time.

Another interesting opportunity for future research would be to study the relationship between the choice of outlet, consumer's preferences, and the food intake. In Vietnam, there are a lot of different options where to consume a ready-made meal, ranging from expensive restaurants to cheap street vendors. However, the relationship between the outlet and consumer's preferences and food intake is not yet studied in Vietnam. It would be interesting to understand the differences in food preferences and food intake for different outlet options, especially since eating out of home is related to changing diets. Each different outlet option could be linked to different preferences and different food intake.

To conclude, this thesis studied the consumer demand model and the food preferences of consumers separately. This thesis showed that, when studying the food preferences, especially the safety of the food a very important food characteristic is for consumers. Consumers are fairly concerned about food safety issues when consuming food out of home. I expect that there might be a negative relation between food safety concerns and the decision to consume food out of home. Hence, future studies could include food safety concerns is the demand model for food consumed out of home to test if there is indeed a (negative) correlation between the two.

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APPENDIX A | Food Preference Model

Intrinsic factors

Intrinsic factors are those which can be attributed directly to food. These consists of appearance, taste, quality, safety, preparation and methods and presentation. Especially food quality is highly relevant to explain the influence of intrinsic factors on food preference (Jung, Sydnor, Lee, and Almanza, 2015; Olsen, 2002). Neumark-Sztainer, Story, Perry, and Casey (1999) argue that taste and appearance were two other factors which had impact on the food preference of adolescents in the USA.

In a study in the southeast of the USA, food quality was positively correlated with the overall dining experience and people have the intention to come back to the same place if they experienced a good quality of the meals (Sulek & Hensley, 2004).

Extrinsic factors

Direct external influences on food preferences are extrinsic factors. Extrinsic factors included in this thesis are the environment, reputation of the outlet, the cleanliness, and the variation of the food. The environment addresses the location where the food is consumed (restaurants, offices, schools, clubs). The environment is different in a very fancy restaurant compared to a fast-food outlet (Khan and Hackler, 1981). However, both eating in a fancy restaurant and in a fast-food outlet results in a higher total energy intake compared when preparing food at home (Powell & Nguyen, 2013).

Also the situation or purpose of the eating occasion affects the preference of food (Jung et al., 2015). The situation is related to the persons you are with (friends, family, alone) when consuming food. But also on which time of the day and which day of the week. Special occasions, like holidays or parties, also influence the food choice (Kara, Kaynak, and Kucukemiroglu, 1995; Neumark-Sztainer et al., 1999). A study conducted in Vietnam concluded that when eating out with friends, the total energy intake was lower among adolescents (Lachat et al. 2011).

Moreover, time and seasonal variations is taken into account. The role of seasonal variations is less present compared to previous times, where regional variability in the food supplies played a significant role. This affected not only the availability of the food but also prices since the supply of goods decreased. Due to the globalisation of food patterns and trade and technological improvements, seasonal foods are produced and accessible the year-round. Hence, seasonal variation effects became less important to the food choice. However, there may still be a seasonal difference present as some foods are consumed more during different seasons (Randall and Sanjur, 1981).

Socio-economic factors

Socio-economic factors are important factors influencing the food preference of consumers. The socioeconomic factors are influence of others, clientelism, advertisement, and special offer.

A special offer of the outlet owner has an influence on the decision to consume food at that specific outlet. The food costs at that specific outlet will decrease in case of a special offer. Food costs are undoubtedly related to the food choice consumers make, and it is considered as one of the main determinants of food choice (Glanz, Basil, Maibach, Goldberg, and Snyder 1998; Popkin et al., 2005).

Next, advertisement influences food preferences. The type of advertisement is dynamic, but overall researchers agree that advertisement influences people's food preference (Borzekowski and Robinson, 2001; Khan and Hackler, 198; Neumark-Sztainer et al., 1999; Tiu Wright, Nancarrow, and Kwok, 2001). Borzekowski and Robinson (2001) studied the impact of television food commercials on the food preference of preschool children. Their results showed that children exposed to the commercials were significantly more likely to choose the advertised items. The short term food preferences were influenced by the commercials. Tiu Wright et al. (2001) highlight the existing media manipulation and hence the creation of social status and prestige to food preferences.

Social factors are related to the people around us and the society we live in. Social eating norms define what is appropriate to eat and what not. Social eating norms exist on both personal level (family and friends) and on local or national level. Influence of others is both direct (cultural practices, actual behaviour in a given situation) and indirect (portion size). Patrick and Nicklas (2005) argued that if your friends, family, or dietitian would recommend a specific type of food – for instance a healthy food choice – you would pick this food quicker. Not only the people close to you influences your preferences. The society also plays a role in this process. People follow the social rules because it enhances a connection with a social group or because it is seen as the correct way of eating (Higgs, 2015; Story et al., 2002).

At a very young age, children start to create preferences for a certain food type. The preference for certain tastes is shaped by the norms and familiarities of your family (Birch, 1999; Story, Neumark-Sztainer, and French, 2002). It is even proven that children were more willing to try new food when it was offered by their mothers. This trend continues during the life of people, since people eat most of the times among family (Cruwys, Bevelander, and Hermans, 2015). Hence, familiarity plays an important role in the start of people's food preferences.

Convenience factors

The last factor is the convenience. The theory of Khan and Hackler (1981) does not explicitly focus on convenience however, multiple authors claim that convenience does influence the food preference of people (Jung, Sydnor, Lee, and Almanza, 2015; EUFIC, 2006; Lachat et al., 2011). Convenience consist of two components; location and time. Location focusses on the easiness of the location of the outlet. People like to go there because it is on their way to work, school, or house. People's preferences are also influenced by the time people are willing to spend on either eating or preparing a particular meal. Sometimes people prefer to spend a long time preparing meals while others don't (Neumark-Sztainer et al., 1999). In addition, some people have less time available to spend on preparing or eating meals. It is important to include convenience into the model since this thesis focuses on the food preferences when people buy ready-made food out of home. Therefore choices related to the location of an outlet and time issues are highly relevant to include in the model. Lachat et al. (2011) claimed that both the short preparation time and the easiness of the location is positively correlated with eating out in Vietnam.

APPENDIX B | Semi-Structured Interviews

Interview number:_____
Gender: _____
District: _____

Label	Interview Text	Comments
Q3	Where do you currently live?	District
Q4	Are you the person who is responsible for most of the food purchases? If no, who is responsible for these purchases?	
Q5	Are you employed at the moment? [If no, continue with Q7]	
Q6	How long do you need to travel to your work / school?	
Q7	How often do you consume food out of home*? On a weekly base (last seven days)?	Out of home: bought outside home, location where it is eaten does not matter
Q8	What was the reason for eating outside the home?	
Q9	Do you buy your food more often at this outlet? If yes, why?	
Q10	Where do you buy most of the ready-made food you consume outside the home?	
Q11	Why did you decide to consume this particular meal?	
Q12	What do you consider as most important when you eat a particular meal in general? Taste Price Healthiness Familiarity Safety Quality Convenience (time) Convenience (location)	Only mention options if the respondent struggles answering the question
Q13	What do you consider as most important when you consume a ready-made meal outside home? Taste Price Healthiness Familiarity Safety Quality Convenience (time) Convenience (location	Only mention options if the respondent struggles answering the question
Q14	Do you eat different types of meals when eating out of home compared to meals you eat at home? [if no, continue with Q16]	

Q15	How do the types of meals differ compared to the types of meals you eat at home?	
Q16	When you buy food at a street vendor, are you concerned about the food safety?	
Q17	Preparing food yourself is safer than buying ready-made food out of home?	

APPENDIX C | Consumer Behaviour Survey

Screening: The respondent for this survey should be the household member who is largely responsible for food shopping and/or food preparation for the household. So, the respondents should be selected accordingly.

S.no	Screening Questions	Unit	Answer
I	Are you the primary person who make food purchase decisions for your household? 1=Yes, 2=No	Code	
II	Are you the primary person who make decisions on food preparation for your household? 1=Yes, 2=No,	Code	

Location Information	Name	Code
Province/City		
District		
Commune/Ward		
Village/Neighbourhood		
Full address:		

Household composition

We are interested in the group of people who live and eat together most of the time in your home, that is more than 6 months of the year and more than 3.5 days of the week. How many are these in your household? (Number)

ID	*Now I would like to get some information about all these people individually.*							*Ask these questions only for members 7 years or older*				*Ask if 17 yrs. or older*
	Can you give their names?	How many months of the past 12 months has [name] lived with household?	Has [name] been living with household for most (more than 3.5 days) of the past 7 days? 1. Yes 2. No	What is the relationship between [name] and the head of the household? 1. Head 2. Spouse 3. Son/daughter 4. Grandchild 5. Father/mother 6. Sister/brother 7. Servant 8. Other relatives 9. Non-relatives (specify)	How old is [name] in completed years?	Is [name] a male or female? 1. Male 2. Female	What is the religion of [name]? 1.No religion 2. Buddhist 3. Catholic 4. Other	What is the highest level of formal education that [name] has completed? 1. No formal education; 2. Primary school; 3. Secondary school; 4. High school; 5. Vocational college/ College; 6. University; 7. Postgraduate	How many years has [name] spent in schooling in completed years?	What is the main activity of [name]? 1. Public employee, 2. Self-employed (running own or family business) 3. Employed at private company/NGO, 4.Non-agricultural daily labourer, 5. Agricultural daily labourer, 6. Student, 7. Unpaid housework, 8. Looking for work, 9. Retired, 10. Unable to work (sick, old, other), 11. Other	What is the second main activity of [name]?	What is the marital status of [name]? 1.Single, 2.Married, 3.Widowed, 4.Divorced, 5. Other (specify)
	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13
A												
B												
C												
D												
E												
F												
G												
H												
I												
J												

General socioeconomic information

S.no	Items	Unit	Answer
A18	Does your household either produce any crops (rice, maize, sweet potatoes, leafy vegetables, other vegetables) for self-consumption (home garden) or to sell? 0=No, 1= Yes, for self-consumption, 2= Yes, for sell, 3= Yes, for both (self-consumption and sell)	Code	
A19	Does your household either raises any livestock: chickens, pigs, fish, cows or other animals) for self-consumption or to sell? 0=No, 1= Yes, for self-consumption, 2= Yes, for sell, 3= Yes, for both (self-consumption and sell)		

Motives for Food Choice

S.no	Items	Answer
E1	It is important to me that the food I eat on a typical day… 1. Not at all important; 2. Somewhat important; 3. Neither unimportant nor important; 4. Quite important; 5. Extremely important	
1	Is easy and/or fast to prepare and cook	
2	Contains no additives	
3	Is low in fat	
4	Is low in calories	
5	Is high in fiber and roughage	
6	Is high in protein	
7	Contains a lot of vitamins and minerals	
9	Tastes good	
10	Smells nice	
11	Looks nice	
12	Has a pleasant texture	
13	Contains natural ingredients, no or little artificial ingredients	
14	Is not expensive/cheap/good value for money	
15	Is familiar/what I usually eat, is like the food I ate when I was a child	
16	Is easily available in shops and supermarkets	
17	Can be bought in shops close to where I live or work	
18	Makes me feel good emotionally (cheers me up, help me cope with stress, relax, etc.)	
19	keeps me awake/alert	
20	Is packaged in an environmentally friendly way	
21	Produced in a humane way	
22	Is produced without chemicals (e.g. pesticides)	
23	Comes from countries I approve of politically	
24	Keeps me healthy (including controlling my weight, good for my skin/teeth/hair/nails, etc.)	
25	Has the country of origin clearly marked	
26	Is not forbidden in my religion	
27	Is advertised in the media (television, radio, internet etc.)	
28	Is recommended by my friends or other people who are important to me	
29	It is safe (low chemicals, clean, properly stored, bacteria free)	
E2	What are the first and second most important of food characteristics to you? I._____ II._____ 1.Taste, 2. Price, 3. Healthfulness, 4. Nutrition, 5. Safety	

Food away from home

S.no	Item	Answer
F7	Did you eat anything / buy any (meal or snack) outside the home in the last 7 days? 0 Yes 1 No	
F8	How many members of your household have eaten food outside the home in the past 7 days?	
F9	Who is the household member who eats out more often? (HH member ID)	
	The following questions (F10 – F25) refer to the HH member who eats out more often	
F10	How many times in total did (you, she, he) eat anything / buy any (meal or snack) outside the home in the past 7 days?	
F11	On an average working/school day, how long does it take (you, him, her) to go to work?/school (in minutes)	
F12	What was the reason for eating outside the home during this period? 1 Work/school (far) away from home 2 No facility for cooking at home 3 For change with the family 4 Chilling out with friends 5. Tastier food 6. Better services and environment 7 Other (specify):	
F13	How much (thousand VND) did (you, he, she) spend on food consumed outside home in the past 7 days?	
F14	At what time of the day do you usually buy food away from home? (multiple answers possible) 1 Early morning: before 9.00 2 Morning: 9.00-11.00 3 Lunch: 11.00-13.00 4 Afternoon: 13.00-16.30 5 Late afternoon 16.30-19.00 6 Evening: after 19.00 7 No regular time	
F15	What is the average estimated time you spend on traveling to the outlet (from school/work or home) where you buy most of your ready-made food? 1 0-5 minutes 2 5-10 minutes 3 10-15 minutes 4 15-20 5 20 minutes or longer	
F16	Did you buy the ready-made food in the same neighbourhood / commune you live in? 0 Yes 1 No	
F17	Where do you buy most of the ready-made food you consume outside the home during a week? 1 street vendor 2 at work / canteen 3 fast food shop 4 restaurant 5 other (specify):	
F18	To what extent, does the food that you buy outside from home, meets your expectations? 1 to 5 code	
F19	How important are the following factors in your choice of outlet where you buy most of your ready-made (processed) food? 1 Not at all 2 Somewhat important 3 Neither unimportant or important 4 Quite important 5 Extremely important 1 Quality of the food 2 Prices of the food 3 Good customer service by the outlet staff 4 Quickly served food 5 Cleanliness and layout of the vendor 6 Reputation of the vendor 7 Healthy food products 8 Safe food 9 Variety of food 10 Freshness of food 11 Meal is tasty 12 Location on the way to work / home 13 Location close to my home or work 14 Social relationship (clientelism) 15 Appearance of the food itself 16 Locally produced food 17 Special offers of the vendor 18 Is recommended by my friends or other people who are important to me 19 Is recommended by my dietitian, doctor, nutritionist or other health care workers 20 Is advertised in the media (television, radio, internet, etc.)	
F20	What are the first and second most important factors mentioned in the previous question?	
F21	How concerned are you about food safety of the outlet where you consume most of your ready-made food? 1 Totally not concerned 2 Not so concerned 3 Neutral 4 Fairly concerned 5 Totally concerned	
F22	To what extent do you trust the food safety claims made by the retailers? 1 Don't trust at all 2 Little trust 3 Moderate trust 4. Much trust 5 Complete trust	

Nutrition Knowledge

The following questions are general questions about nutrition. Please answer based on your knowledge; don't make any guess. If you don't know the answer, you can always say "Not sure".

S.no		Answer
G4	In your opinion, given the knowledge that you have heard from nutritionist/health experts. Do you think that in healthy diet people should be eating more, the same amount, or less of these foods? 1. More, 2. Less, 3. Not sure I. Vegetables_____ II. Sugary foods_____ III. Meat_____ IV. Starchy foods_____ V. Fatty foods_____ VI. High fiber foods____ VII. Fruit_____ VIII. Salty foods_____	
G5	In general are these foods High or Low in starch (carbohydrate)? 1. High, 2. Low, 3. Not sure 1 Beef 2. Pasta 3. Cabbage 4. Bread 5. Rice 6. Chicken 7. Honey	
G6	Are the following foods High or Low in protein? 1. High, 2. Low, 3. Not sure 1. Chicken 2. Peanut 3. Beans 4. Watermelon 5. Potato 6. Egg	
G7	Evaluate the following statements. 1. True, 2. False 3. Not sure 1. What one eats can affect the risk of getting a disease._____ 2. Milk is important for the development and strength of our bones._____ 6. Soya beans are a good source of proteins._____ 7. Removing the skin from chicken reduces the fat content._____ 11. Carbohydrates are not as easily and rapidly digested as protein and fat._____ 12. Children without appetite should be forced to eat._____ 14. Saturated fats are usually found in animal products like meat and dairy._____ 15. Cooking vegetables for a long time can reduce their nutritional value._____ 16. Sun light is an important source of vitamin C._____ 17. Pregnant women should avoid fatty foods, like meat, milk and yoghurt to avoid fatty baby and difficulty during deliver._____ 18. Food leftovers should be kept in a cool place because higher temperatures make germs grow faster._____	
G8	Which food group is our body's highest source of energy? _____ 1. Meat Group; 2. Fats and oils; 3. Breads and cereals; 4. Milk and cheese; 5. Not sure	
G9	Which one of these is more likely to raise people's blood cholesterol level? 1. Vegetables, 2. Fruits, 3. Animal fats, 4. Plant oils, 5. Legumes, 6. Not sure	
G10	The bread, cereal, rice and pasta are a good source of 1. Carbohydrate, 2. Vitamin C, 3. Protein, 4. Vitamin D, 5. Not sure	
G12	Which of these serious health problems has/have been linked to obesity? 1. Type 2 diabetes; 2. Heart disease; 3. High blood pressure; 4. Stroke; 5. All of the above; 6. Not sure	
G13	Risk of high blood pressure is most likely to be reduced by eating a diet with 1. Less sugar, 2. More fiber, 3. More iron, 4. Less salt, 5. Not sure	
G14	Goiter is a disorder related to which diet 1. Calcium, 2. Iodine, 3. Iron, 4. Vitamin C, 5. Not sure	
G15	At what age should solid foods be introduced to children? 1. After six months; 2. After one year; 3. After 1.5 years; 4. After 2 years; 5. Not sure	
G17	Experts recommend consuming foods with more vitamins and minerals. Food companies add them through a process called fortification (i.e. fortified foods). Which of these foods has iodine mandatory added? 1. Vegetable oil, 2. Powdered milk, 3. Table salt, 4. Wheat flour; 5. Not sure	

Income

S.no	Items	Answer
	What is your household monthly total income, i.e., income earned by all household members and property rent in Vietnamese million VND? 1. Less than 3 ; 2. 3 – 4.9; 3. 5 – 6.9; 4. 7 – 8.9; 5. 9 – 10.9; 6. 11 – 12.9; 7. 13 – 14.9; 8. 15 – 16.9; 9. 17 – 19.9; 10. From 20	