

**The role of perceived quality, ambivalence and health involvement as a
basis for clustering – A study of fish consumption in Vietnam**



Master thesis in Fisheries and Aquaculture Management and Economics
(30 credits)

By
Bui Bich Xuan

The Norwegian College of Fishery Science
University of Tromsø, Norway
&
Nha Trang University, Vietnam

May 2009



Abstract

The purpose of this study was to examine the applicability of benefits sought – based segmentation for fish market in Vietnam. A convenient sample of 809 Vietnamese households was provided to answer the questionnaires, including the questions about attitudes towards fish consumption. Cluster analysis was used to identify three distinctive consumer segments based on evaluation of quality, ambivalence and health involvement towards fish consumption. These three segments were termed the Satisfied, the Ambivalent and the Neutral segments. While the Satisfied have positive attitudes and the Neutral have uncertain feelings towards fish consumption, the Ambivalent have mixed feelings towards fish eating behavior. The Ambivalent consumers reveal the attitudes and behavior towards fish products somewhere between the Satisfied and the Neutral segments on most variables. However, they are close to the “Satisfied” on most areas, e.g. perceived quality, health involvement, perception of fish convenience, social and moral norms. The quality and the smell of fish are found as the main variables contributing to determine the classification of the Satisfied segment. And the variable of “*mixed emotions*” is found as the most important to determine the classification of the Ambivalent segment,. The practical implications for marketers within the fish industry are the effectively strategies to increase the satisfaction and the loyalty of the Satisfied and Neutral consumers.

Keywords: Fish consumption, ambivalence, segmentation, health involvement, perceived quality.

Acknowledgements

I specially would like to thank my supervisor, Professor Svein Ottar Olsen, who supported me and gave me a lot of guidance and valuable comments.

I also give many thanks to m colleagues in Nha Trand University, Dr. Nguyen Van Ngoc and Msc. Ho Huy Tuu, who helped me in analyzing the data.

I would like to thank NORAD for funding my study in Fisheries and Aquaculture Management and Economics at Nha Trang University. Thanks to NTU for the time and facilities they have provided to this International Master course.

Thank you very much for my family, they have supported and encouraged me a lot. Thanks my closest friend for giving me valuable comments and suggestions and help me improve the English language.

The data used in the thesis is provided by the NORAD Project.

Nhatrang, May 15th 2009

Bui Bich Xuan

TABLE OF CONTENTS

List of figures.....	iv
List of tables.....	iv
1. INTRODUCTION.....	1
1.1. Background.....	1
1.2. Purpose of research.....	3
2. CONCEPTUAL FRAMWORK.....	5
2.1. Classifying consumers and identifying segments.....	5
2.2. Segmentation based on attitudes, benefits and preferences.....	6
2.3. Perceived quality.....	7
2.4. Ambivalence.....	9
2.5. Health involvement.....	10
2.6. Fish/seafood and consumer behavior.....	12
2.6.1. Convenience and convenience orientation.....	12
2.6.2. Norms and moral.....	13
2.6.3. Demographics (including regional aspects).....	14
2.7. Analytical model.....	15
3. MATERIALS AND METHODS.....	17
3.1. Sample and subjects.....	17
3.2. Measurements of constructs.....	18
3.3. Data analysis procedures.....	20
4. RESULTS.....	22
4.1. Cluster identification.....	22
4.2. Testing the clustering solution.....	24
4.3. Segment profiles.....	26
4.3.1. Consumption.....	32
4.3.2. Convenience.....	33
4.3.3. Social norms and moral obligations.....	33
4.3.4. Demographics.....	33
4.3.5. Summary of the segments.....	34
5. DISCUSSION AND IMPLICATIONS.....	37
References:.....	41

List of figures

Figure 1: The structure model of category and profiling variables.....	16
------------------------------------------------------------------------	----

List of tables

Table 3-1: Social-demographic characteristics of the sample	18
Table 4-1: Summary statistics of cluster solutions	23
Table 4-2: Results of the discriminant analysis	24
Table 4-3: Results of the discriminant analysis	24
Table 4-4: Results of the discriminant analysis	25
Table 4-5: Profiling the different segments against statements about social norms, moral obligation, convenience and fish consumption (ANOVA-analysis).....	27
Table 4-6: Characteristics (group mean values) of demographic, by three segments.....	29
Table 4-7: Model fitting information for multinomial logistic regression.....	30
Table 4-8: Likelihood Ratio Tests.....	30
Table 4-9: Multinomial logit regression of segments on selected independent variables.	31

1. INTRODUCTION

1.1. Background

There are several ways to segment the market depending on marketing objectives. The first step in developing a segmentation strategy is to select the most appropriate bases on which to segment the market. According to Schiffman and Kanuk (2004), there are many different bases used for segmentation including geographic segments, demographic segments, psychological segments, lifestyle segments, social cultural segments, use-related segments, use-situation segments, benefits-seeking segments and hybrid segments. The second step is to profile the differences between segments based on profiling variables which are different from category variables. Previous studies suggested that preference or benefit - based segmentation is a beneficial way to identify segments because it often provides better relationship with actual purchase or consumption (Haley, 1968; Connor & Sullivan, 1995; Honkanen et al., 2004; Olsen et al., 2008).

Consumers differ in their preferences, attitudes and behavior related to products and services. For example, Sohail and Shanmugham (2003) suggested that the preferences for e-banking services by consumers in Malaysia are different for each of the factors such as accessibility, reluctance, costs, trust, security, convenience. Some consumers prefer to go shopping by traditional way (physical retailer), believing that the most important attributes of a product are best displayed in these stores. By contrast, other consumers will do online purchases of products that are standardized and which do not require personal inspection for quality evaluation (Korgaonkar et al., 2006; Levin et al., 2003). In the area of tourist research, Molera and Albaladejo (2007) found five segments of tourists who sought different benefits (e.g., natural, culture, or family benefits) for their holiday experiences. Matear and Gray (1995) indicated that consumers differ in their search for benefits in a freight transport market. The benefit could be divided into three segments: route sensitive (convenience of the route), not price sensitive (stress high level of service care), and price sensitive. Several other studies suggested that differences in attitudes, preferences or benefits with products or services ought to influence marketing or consumer segmentation (Kim et al., 2002; Myrland et al., 2000; Honkanen et al., 2004; Olsen et al., 2008; Vinson et al., 1977).

These differences described above are also relevant for food and seafood. Honkanen et al., (2004) indicated that the preferences by Norwegian teenagers for common meals

differ with respect to their like and dislike of for example fish and meat, and that the different segments (e.g., fish lovers versus fish haters) differ in their attitudes towards health, interest, lifestyle, demographic attributes. Moreover, the evaluation and perception of fish quality by the consumers are used as a basis for benefit-based segmentation in Belgium (Verbeke et al., 2006). In addition, different attitudes to time and to shopping for food by individuals were suggested as basis for segmentation and conduct-different shopping behavior. In these studies time attitudes were thus used as a basis for food consumer segmentation (Chetthamrongchai & Davies, 2000; Darian & Cohen, 1995).

Vietnam is a country with abundance of fish and seafood from aquaculture and fishery. Fish/seafood is popular and important as food in Vietnam. Based on the Food Balance Sheets data provided by FAO, the annual per capita consumption of fish/seafood was 17.45 kg in 2003 and estimated increasing to 20-25 kg in 2010. Comparing to other animal products, per capita consumption of pork and poultry meat being 22.01 kg and 5.61 kg in 2003 respectively, fish/seafood was the second largest consumption of animal products.

Several studies have suggested that preferences for fish differ between cultures and regional areas. Pieniak et al., (2008b) suggested that the large differences in fish consumption between countries are mostly by traditions and habits; the level of consumption is also enhanced by nutrition education and effective promotion of fish. There is also the substantial regional differences in level of seafood consumption based on the availability of fresh local seafood (Myrland et al, 2000; Verbeke & Vackier, 2005). The different levels of convenience orientation and perceived inconvenience of fish between cultures in five European countries were explored by Olsen et al., (2007).

In the study reported in this thesis some possible differences in fish preferences for four different regions in Vietnam have been investigated. No study I am aware of has previously tried to identify different segments for fish consumers in Vietnam.

Important benefits for fish and seafood are perceived quality/taste (including smell, odor, texture and appearance), health benefits, nutrition, convenience, price, and availability. A previous study by Olsen (2004) indicated that perceived quality is one of the most important factors determining the behavior of the consumer toward fish/seafood. However, some recent studies have shown that consumers in Western countries are ambivalent or have mixed feelings or preferences toward seafood (Olsen, 2001; Olsen,

2004). Pieniak et al., (2008b) suggested that in some European countries it is a positive relationship between health involvement and fish consumption. The perceived health benefits of seafood have been shown in several studies (Foxall & Maddock, 1998; see also Olsen, 2004 for a review; Verbeke & Vackier, 2004). On the other hand, risk perception of poisoning from eating fish has negatively affected fish consumption. Both positive and negative attitudes (trustworthiness, health, safety, nutritional value, taste and satisfaction versus high price and bones in fish) towards fish were also found in Belgium (Verbeke & Vackier, 2005). Only one study (Olsen et al., 2008) I am aware of has included ambivalence as a basis for segmentation. Thus, the study reported in this thesis will include both ambivalence and health involvement as basis for segmentation as well.

1.2. Purpose of research

The purpose of this thesis is to discuss how segmentation can be used to give a better understanding of the consumer market for fish in Vietnam. Specifically, the objectives of this thesis are:

- To identify the roles of product benefits, ambivalence and health involvement in segmenting the market for fish in four areas of Vietnam.
- To profile the characteristics of consumers of each conducted segment based on distinctive consumer characteristics (e.g., attitude towards consumption, convenience, norms, obligation, demographics) and geographic areas.
- To suggest managerial implications.

More specifically, the thesis will answer the following main questions:

- (1) How many clusters can be inferred from data analysis?
- (2) Which predictor variables contribute to most of the inter-group differences?
- (3) Do various market segments differ in terms of consumption of fish, perceived product convenience, social norms, moral obligation, demographic variables and geographic areas?

Only by an understanding of the different consumer segments the marketers will be able to develop effective strategies to attract and maintain the customers. This study is unique

in a number of ways. First, it is the first study I am aware of which perform a segmentation of fish market in Vietnam. Second, the study examines the usefulness of applying attitudes - based segmentation on fish consumption, using three attitudes towards fish eating as basis for segmenting consumers, i.e. taste preferences, ambivalence and perceived health benefits.

The present study is built on the preference and ambivalence literatures and researches about food and seafood consumption behavior (Berndsen & Pligt, 2004; Conner & Sparks, 2002; Conner et al., 2002; Conner et al., 2003; Drewnowski, 1997; Li et al., 2000; Mozaffarian & Rimm, 2006; Myrland et al., 2000; Olsen, 2004; Olsen et al., 2007). According to Myrland et al., (2000), consumers who are similar in beliefs, attitudes, or preferences within a particular classification can be grouped together. Moreover, Olsen et al., (2008) showed that consumers who are both positive and negative in their attitudes towards convenience food can also be classified into one group, namely ambivalent consumers. Fish/seafood has been shown to be healthy food (Foxall et al., 1998; Olsen, 2003; Pieniak et al., 2008b). However, many people dislike eating fish because fish is experienced as having bad smell and bones, high price, being inconvenient and people lack knowledge to cook (Olsen, 2004).

Data used in this thesis is from a survey that was performed in four cities, Nhatrang, Dalat, Ho Chi Minh and Cantho in the South of Vietnam. A convenience sample of 809 questionnaires was collected in 2006. The market segmentation will be performed by hierarchic cluster analysis and discriminant analysis. The profiling of the segments will be performed by ANOVA, cross-tabulation, and multinomial logistic regression. These analysis processes will be supported by SPSS 16.0

In the next part (part 2), the relevant literature in this area has been reviewed. In this part (part 1) the concepts of segmentation, perceived quality, ambivalence, health involvement, convenience and some profiling variables have briefly been introduced. In part 3 the materials and the research methodology have been described, focusing on the measurement, cluster analysis, and techniques for group mean differences. Then, the following (part 4) is presentation of the results from the empirical survey. The last part (part 5) is discussion and implication of this study.

2. CONCEPTUAL FRAMWORK

Segmentation is a research area that has been popular in many years (Assael & Roscoe, 1976; Green, 1977). According to Schiffman and Kanuk (2004), “market segmentation can be defined as the process of dividing a market into distinct subsets of consumers with common needs or characteristics and selecting one or more segments to target with a distinct market mix”. Market segmentation is thought to be a strategic marketing tool to understand markets and thereby help allocating resources for targeting specific consumer or customer group (Assael & Roscoe, 1976; Wind, 1978).

Faced with heterogeneous markets, how can companies maximize their profits? By following a market segmentation strategy, a firm can increase the expected profitability. Based on some characteristics – segmentation bases, consumers can be classified into relative homogeneous groups that differ substantially in purchase behavior. These segments would then be profiled following other characteristics – descriptors to highlight the differences between these groups.

2.1. Classifying consumers and identifying segments

In practice, marketing segmentation starts with a process of dividing the consumer market in meaningful buying groups based on some kind of consumer classifications. Different levels of consumer classification are suggested in the literature (Schiffman & Kanuk, 2004) such as personal characteristics, benefits sought by consumers or different kind of behavioral variables. These segments would then be profiled following other characteristics/descriptors to highlight the differences between the various segments. Methods used for carrying out segmentation have also developed in variety and sophistication (Assael & Roscoe, 1976).

E. Green (1977) indicated there are two basic approaches to segmentation – a priori and post hoc, or possibly a hybrid of the two – as described by previous researches. A priori segmentation is an approach where the number of clusters are chosen in advance by the researchers, and then respondents are categorized into these segments and are further examined regarding their differences in other characteristics. By post hoc segmentation, in which respondents are grouped according to the similarities of their characteristics – called bases, then these segments can be further examined for differences in other characteristics – profiling variables, these variables are not used in the original definition

(bases variables). The number of clusters is not being known until the cluster analysis has been completed.

2.2. Segmentation based on attitudes, benefits and preferences

There have been various approaches to the use of bases for segmentation. Product benefit-seeking have been used as the bases for segmentation (Honkanen et al., 2004; Olsen, 2008; Verbeke et al., 2006). Market segmentation based on consumer time shortage for shopping was done by Darian & Cohen (1995). Attitudes of the consumer to shopping (Chetthamrongchai & Davies, 2000), lifestyle (Schewe & Calantone, 1978) and involvement-based segmentation (Verbeke & Vackier, 2004) have also been used as bases for segmentation. Of these bases, benefits sought – based segmentation is probably the most widely used to identify the segments, because the benefits sought by people when consuming a product give the basis reasons for the existence of true market (Haley, 1968). The purpose of seeking product benefits is to satisfy the personal needs. Thus, benefits sought – based segmentation is most useful approach to describe behavior and explain it (Myers, 1996). And a post hoc segmentation method should be preferred (Maenpaa, 2006).

Attitudes or preferences are suggested as being one of the main factors in explaining generally food consumption behavior or seafood consumption behavior particularly (Myrland et al., 2000; Honkanen et al., 2004; Olsen et al., 2008). Aikman and Crites (2007) defined attitudes as evaluations (like/dislike, favor/disfavor, good/bad) of a particular entity (e.g., food) that summarize information regarding this object (e.g., healthiness, taste). In this aspect, Olsen (1999) included factors such as perceived quality of products, product preferences and satisfaction as different facets of attitude evaluation. Base on identified information, Aikman et al., (2006) suggested that food attitudes are based on five distinct information bases: positive affect, negative effect, cognitive qualities (e.g., healthy, natural), general sensory qualities (e.g., taste, smell), and specific sensory qualities (e.g., salty, greasy).

The various definitions of attitudes have guided marketing researchers to use benefit or need as the core concept in attitude – based segmentation (Olsen et al., 2008). Benefit - based segmentation is a method in which consumers are classified according to their actual needs and wants of a given product (Maenpaa, 2006). These product benefits can

be economy, price, prestige, convenience, quality or taste, time used, nutrition and so forth.

The present thesis chooses a post hoc segmentation approach with benefits sought-based segmentation. The main benefit factors that form the basis for segmentation of this study are including perceived quality, ambivalence related to perceived health effects, negative perception for fish consumption by the consumer (e.g., bones, bad smell) and competing motives between internal and external norms, and health involvement. This study also is discussing about some of the main variables used to profile consumers in the area of seafood/fish such as social norms, moral obligation, convenience, demographics variables (age, sex, marital status, income, size of the household, education) including regions.

2.3. Perceived quality

How do consumers perceive food quality? According to Ophuis and Trijp (1996), the perceived quality depends on the judgments by the consumers, this likes an attitude. It is the result of a perception process. The quality evaluation may be based on previous experience by the consumer or on credence (Brunso et al., 2002; Anderson & Anderson, 1991; Grunert, 2005; Holm & Kildevang, 1996). Steenkamp (1989) suggested that perceived quality plays an important role in making decision processes of the consumer, like the mediator. Because consumers differ in their perceptual abilities, personal preferences and experience level, then perceived quality must be considered as a variable.

Which quality characteristics will the consumers perceive as the most important? Within the context of foods, taste is considered to be the most important quality attribute influencing food selection ((Drewnowski, 1997; Roininen et al., 1999). Some taste sensation can be thought of as good or bad. Some other quality attributes for foods are freshness, convenience, nutritional values, healthy, safety perception, and label of products (Nielsen, 2002; Ophuis & Trijp, 1996).

In this study the discussion of quality will be limited to quality of fish/seafood. In a study by Anderson and Anderson (1991), seafood quality is a mixture of attributes, including nutritional value; presence of micro-organisms and bacteria; incidence of parasites; shelf life; level of additives, irradiation, pesticides, or preservatives; taste; amount of discoloration; number of bones; size; number of scars or cuts; odor; uniformity; and a

host of other factors which may be used to define quality. Different attributes of quality are important to different users.

Also according to Anderson and Anderson (1991), there are two methods that may be used to evaluate fish quality, i.e. consumers can use experience characteristics such as taste and texture attributes or alternatively, they can use credence characteristics to determine the quality of fish such as nutritional content, contamination levels, and presence of additives. What cues do consumers use to assess fish/seafood quality? Nielsen et al., (2002) suggested that when considering sensory evaluation of fish/seafood one has to think of both intrinsic quality cues such as species, fat content, smell, appearance and extrinsic quality cues including price, convenience, origin, handling. How do consumers perceive fish/seafood quality? Grunert (2005) showed a hierarchical value map for fresh fish which was cited from Nielsen et al., (1997), where the perceived quality of fish mainly related to taste, texture, health (the content of vitamins and minerals)/perceived nutrition and lack of convenience (fish is difficult to prepare, bones, etc.). Besides these attributes which are considered as important in food choice, consumption patterns are also affected by product safety, price, prestige (Olsen, 2004). Other demographic, sociocultural, and economic factors also make an impact on fish consumption (Myrland et al., 2000).

This study will focus on taste perceptions as the main attributes of perceived quality. Perceived taste of fish will be used as a preference measurement because it helps determine preferences and eating habits towards fish consumption (Drewnowski, 1997) and because it is proved that general liking may present stable segments and these are useful for managerial implementation (Olsen et al., 2004). Myrland et al., (2000) suggested that taste of both fat and lean fish and smell of lean fish are attributes affecting consumption frequency. However, perceived taste of fish as a negative attribute depends on the experience of the consumer in preparing fish as a meal. The more experienced consumers have a more positive attitude towards healthiness of fish rather than focusing on less important negative aspects (taste, bones, difficult to cook, etc). Vice versa for the less experienced consumers, the health factor is less important and the negative attributes are more clearly mentioned (Verbeke & Vackier, 2005).

Besides taste perception which is considered as emerging attribute of perceived quality, nutritious value and price of fish are also suggested as important determinants affecting

fish consumption (Olsen, 2004). Sidhu (2003) showed that contains omega-3 polyunsaturated fatty acids (PUFAs) in fish, with their nutritional health benefits, are important attributes. Thus, health beliefs are found to be a mediator of fish consumption behavior (Pieniak et al., 2008a). Trondsen et al., 2003 indicated that perception of fish as high priced food (for consumers with low income) was negative significant affection to fat fish consumption.

As can be seen from discussion above, perceived quality is defined in various ways; this study will define quality as attribute- or belief-based evaluation, including general perceived quality, taste perception, nutritional value and price of fish (Olsen et al., 2008).

2.4. Ambivalence.

Ambivalence has been defined in various ways, given our the beliefs that ambivalence is important to attitude research. Most of the definitions about ambivalence in literatures are discussed around the simultaneous existence of positive and negative evaluations towards an attitude object (Conner & Sparks, 2002). People who are ambivalent may perceive both advantages and disadvantages towards an object simultaneously (Povey et al., 2001). Conner et al., (2002) suggested some researches on ambivalence focus more on people's beliefs, while others focus more directly on people's attitudes, given that the relationship between beliefs and attitudes may be complicated. Food attitudes and behavior has been linked to ambivalence from different perspectives as mixed feelings, competing motives or variations in food preferences (Olsen, 1999). This study defines ambivalence in accordance with attitudinal ambivalence.

Many health-related behaviors are likely to be associated with ambivalence, e.g. eating sweet and fatty food is perceived as bad for body image (Sparks et al., 2001) or eating healthy foods (e.g., fish) can be perceived as less tasty, bad smell during preparation, difficult to prepare (Trondsen et al., 2003). Holm and Kildevang (1996) indicated that the consumers have difficulties in choosing foods which involves feelings of ambivalence, helplessness and personal shortcomings.

Sparks (2001) reported that ambivalence can act as an important moderator of the attitude-behavior relationship. The higher levels of ambivalence would be linked to a weaker relationship between attitudes and behavioral intentions; ambivalence is an important effect on attitude strength (Povey et al., 2001; Conner et al., 2003). According

to Berndsen and Pligt (2004), the persons who are more ambivalent consume less meat and are more willing to reduce their consumption in the future than less ambivalent persons. In a study consequence of ambivalence on satisfaction and loyalty, Olsen et al., (2005) indicated a negative relationship between ambivalence and satisfaction; ambivalent consumers are less satisfied in eating seafood than less ambivalent ones. According to Olsen (1999), mixed feelings may increase when people feel that some foods have a good taste but a bad after taste, or taste good with some other food but not as single article. The present thesis explores how ambivalent attitudes and preferences can be used in understanding consumer behavior related to fish consumption.

From a number of different research perspectives, fish consumption has been associated with ambivalence. According to Olsen (2004), the reasons for eating fish include taste, nutrition and health involvement, as well as social influences such as family and friends; reasons for not eating fish include negative effects of smell and bones, high price, inconvenience and lack of knowledge. Berndsen (2003) indicated that there is a relationship between ambivalence and feelings, morally issues and perceived risks. The more ambivalent the consumers are the more negative feelings they have towards fish and moral issues and perceived risks are more important, and vice versa. This study suggests that ambivalence between perceived quality and health involvement or between social and moral norms may cause different segments of consumers. The reasons for this may be a possible conflict between taste preferences and fish as a healthy meal or because of the conflicting between external norms and internal norms (Olsen, 2004, for an overview).

2.5. Health involvement

The concept of involvement has been used widely in the research literatures of consumer behavior. Involvement is defined as “a person’s perceived relevance of the object based on their inherent needs, values, and interests” (Solomon, 2004). Involvement has been shown as a mediator between satisfaction and repurchase loyalty (Olsen, 2007), including fish consumption behavior in particular (Olsen, 2001). Involvement in healthy eating has been proved to have positively influence on fish purchasing behavior, the greater the involvement in healthy eating the greater the probability that people are willing to buy polyunsaturated fatty acids (PUFAs) fish (Foxall et al., 1998). Based on Solomon’s definition, we can define health involvement as personal relevance and importance attached to health matter, based on their inherent needs, values, and interests.

Many previous studies have discussed fish intake and health benefits. Fish/seafood is an important part of a healthy diet (Trondsen et al., 2003), being an important source of nutrients, particularly proteins, retinol, vitamins (namely A, B3, B6 and D), minerals (calcium, iron, selenium, iodine, zinc, etc.) and the omega-3 polyunsaturated fatty acids (Sumner & Ross, 2002; Sidhu, 2003). By contrast, fish may be contaminated with pathogenic bacteria, viruses, biotoxins, biogenic amines and other environmental hazards. Mozaffarian and B. Rimm (2006) showed that health benefits of eating fish exceeded the potential risks; it is very healthy to consume modest amount of fish every week, especially for adults and women of childbearing age.

Sidhu (2003) mentioned that consumption of fish or fish oil containing omega-3 polyunsaturated fatty acids (PUFAs) decreases the risk of coronary heart disease, reduces mild hypertension, and prevents certain cardiac arrhythmias and sudden death. Pieniak et al., (2008b) indicated that in general consumers are very involved with their health and very interested in healthy eating and in fish consumption particularly. In a study about fish consumption in five European countries, the results indicated that the consumers from households with a medical history of cardiovascular diseases (CVD) have a higher frequency of total fish than consumers without medical history of CVD (Penniak et al., 2008a).

As mentioned above, fish/seafood can be seen as a healthy food, so people that are involved in healthy eating readily believe the health benefits of consuming fish/seafood (Foxall et al., 1998). Furthermore, health involvement is proved as a moderator towards consumer behavior on seafood (Olsen, 2001; 2003 & 2004). Several researches showed that elderly people are more aware of their health and therefore, they eat fish/seafood more often than younger (Myrland et al., 2000; Li et al., 2000; Olsen, 2003). However, involvement in healthy eating is not always a main reason for buying fish/seafood; since the fact that in a healthy diet it is unnecessary to include fish/seafood. A healthy diet can be made up by combinations of different foodstuffs which may or may not including fish (Foxall et al., 1998).

Oakes and Slotterback (2001) reported there was a significant difference toward perception of healthy foods between men and women. Similar findings reported by Roininen et al., (1999) showed that females were more interested than males in healthy eating. This makes sense in the context that the roles of women in preparing family meals

are very important. High evaluations on nutritious value of fish are the main reasons for them to serve their family with fish dishes.

2.6. Fish/seafood and consumer behavior.

As can be seen from discussions above, fish/seafood consumption behavior is affected by various elements. The determinants forming attitudes and preferences of the consumers towards buying and consuming seafood are taste, distaste (negative effect), nutritional value and quality. These factors are included in this study as basis for segmentation.

As reviewed by Olsen (2004), social norms, moral obligations and health involvement are also factors used in explaining seafood consumption. Some important barriers towards seafood consumption are price/cost, convenience, lack of knowledge and availability of top-fresh products. In a study by Myrland et al., (2004) on seafood consumption in Norway, it was shown that poor taste, bad smell, variable quality and supply and limited product choice did not affect seafood consumption. However, perceived taste, difficulties in preparing meal of fish/seafood and demographic variables (including size of household, age, education and income) play an important role in determining the frequency of consumption. This study will focus on convenience, norms and moral, frequency of consumption and demographic (includes region) in profiling the consumer segments.

2.6.1. Convenience and convenience orientation.

Convenience was shown to be a very important feature of food choice (Steptoe et al., 1995). There are many definitions of convenience. Most of the researchers within the area of food consumption behavior connect convenience not only to the attributes of a product, but also to the time available for cooking (Candel, 2001; Warde, 1999) and resource restrictions such as household resources, special skills and experience, or the combination between fish and availability of other ingredients to be used in the meal (Olsen et al., 2007; Scholderer & Grunert, 2004).

Olsen et al., (2007) also made a distinction between convenience orientation and perceived product convenience. Whilst the former refers to a feature of consumer, the latter refers to an attribute of the specific product. In this study, he proved that convenience orientation have directly effect on the perceived inconvenience of fish, this

impacts on attitude towards eating fish and fish consumption as well. Convenience-oriented consumers perceive fish as inconvenient, thus getting lower attitudes towards fish and less fish consumption. However, also in other study by Olsen (2003) proved that perceived convenience did not affect to seafood consumption in Norway. In a study by Candel (2001) convenience orientation is defined as the degree to which a consumer is tended to save time and energy with regard to meal preparation. Family size, presence of children was related to convenience orientation. Single households being more convenience oriented; family with children being less convenience oriented. Besides of that, convenience orientation is also connected with taste, health and price, which together may be considered as important evaluation criteria underlying consumers' preference towards food-related behaviors.

Fish is considered as inconvenient food item due to the need of a large amount of time and effort in shopping and cooking (Gofton, 1995). Moreover, the bones in fish and the smell of fish after cooking are perceived as negative attributes. The bones in fish are small and fine, so fish is potentially dangerous to children and elder (Leek et al., 2000). Concerning the knowledge and experience with fish, Gofton (1995) indicated that some consumers in all countries perceive fish as convenient, maybe because of their knowledge and skills to cook meal with fish.

The present study defines convenience as followings: first, convenience is considered as perceived product convenience, referring this to preparing or cooking (time use and ease/difficulty in cooking) (Olsen, 2003; Olsen et al., 2007) and second, convenience related to the knowledge and skill towards fish meal preparation.

2.6.2. Norms and moral.

Tuu et al., (2008) found that social norms have a significant positive influence on intention on fish consumption behavior in Vietnam within a family situation. Myrland et al., (2000) also showed that social norms and influence from the family, e.g. the presence of children in the household, especially teenagers, affected negatively the consumption frequency of fat and lean fish. Ajzen (1991) defined and measured social norms as social factors pressuring behavior of consumer to perform or not to perform, such as expectations from people in general (subjective norms) or from specific groups or individuals (normative beliefs) (Verbeke & Vackier, 2005).

In consumer behavior context, it is necessary to consider not only perceived social pressures but also personal feelings of moral obligation or responsibility to perform or reject to do a certain thing (Ajzen, 1991). Social norms can drive a person not to perform a certain way, for example a housewife will not cook fish as a family meal if someone in the family does not want to eat. In spite of this, the moral obligation of a mother to give the family a healthy meal will force her to cook fish for the family (Olsen, 2001). This may result a conflict or mixed feelings between moral obligation (eating fish as a healthy diet) and social norm (Verbeke & Vackier, 2005). Thus, this study will include social norms (external expectations and demands) and moral obligation (internal moral norms) as profiling variables.

2.6.3. Demographics (including regional aspects).

Myrland et al., (2000) found that there is a positive relationship between age and attitude toward seafood, and that increase in age increases the seafood consumption in the households. Moreover, a higher health involvement is observed with older people (Olsen, 2003). Verbeke and Vackier (2005) indicated that social-demographic variables such as gender, age, region and presence of children are significant in explaining fish consumption decision.

With respect to education and income, Myrland et al., (2000) suggested that people with a higher education level have a larger fish consumption. This group of people has also a higher belief in the difficulties of preparing fish meals. This may explain a demand for convenience by this consumer group. However, income plays a small role in explaining the frequency of seafood consumption. Penniak et al (2008a) suggested that age, education and health believes influence the frequency of fish consumption.

Geographic – regions – cultural aspects have been shown to make differences in preferences, habits and level of consumption of food in general or fish in particularly. Larsen and Grunert (2003) in one conjoin study of the perceived healthiness of functional foods showed that the attitudes towards healthy foods of the Finnish people were more positive than the Americans and especially the Dannish people. The differences were also associated with cultural values. In a study on fish consumption behavior in two countries: Spain and Belgium, Pieniak et al., (2007b) showed that Spanish women are more experienced, have better knowledge of fish, and higher level of consumption of fish compared with the Belgian women. Myrland et al., (2000) found that difference in

regions plays an important role in seafood demand. For example, citizens living in northern Norway consume lean seafood dishes more frequently than do those from other regions because of the availability of lean fresh cod in this area.

2.7. Analytical model

The purpose of the conceptual discussion above is to clarify various concepts and to form a conceptual model for this study. A benefit set is some different attributes of product which a consumer considers in making a purchase decision. The attributes, selected to use as bases for the market segmentation in this study, are perceived quality/taste preferences, ambivalence and health involvement about fish/seafood. In this discussion we also describe how these attributes have an impact on fish consumption attitudes and behavior. A particular focus is on mixed feelings of eating fish related to perceived health benefits against a negative perception by the consumers for fish consumption (e.g., bones, bad smell, difficult to prepare, take time to cook) or conflict between social and moral norms and why these factors may contribute to a broad understanding of benefit-based segmentation.

In order to understand the complexity of fish consumption behavior, it is important to also understand the constructs together with other antecedents. Thus, this study includes the conceptual discussion with a more specific review of determinants on fish consumption. The results from this discussion identify some of the main variables used to profile consumers in different segments, including frequency of consumption towards fish, convenience, social norms, moral obligation, geographic and some basic demographics (age, gender, household size and education).

The choice of these variables was based on findings reported in the research together with the previous discussion of consumer behavior and of fish consumption as a healthy diet. A conceptual model for the benefit-based segmentation is illustrated in Figure 1.

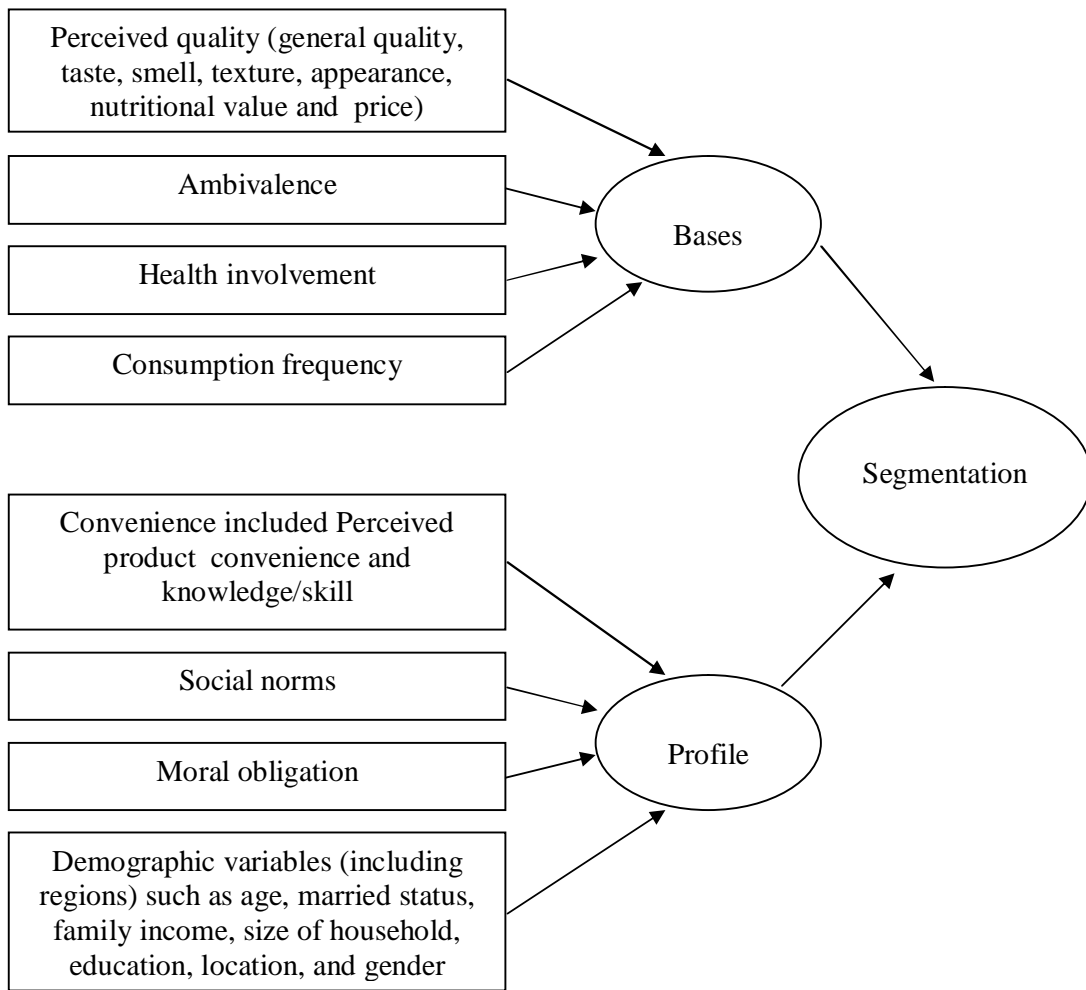


Figure 1: The structure model of category and profiling variables

The procedures for segmentation and the methodological parts of it will be discussed in the next part.

3. MATERIALS AND METHODS

This part presents the process of data collection, questionnaires and analysis methods. A convenience survey of attitudes towards and consumption of fish was performed by Vietnamese consumers. The designing items to measure the constructs was done. Cluster analysis, Discriminant analysis, ANOVA procedure, Crosstabs procedure and Multinomial logistic regression are main methods mentioned in this section.

3.1. Sample and subjects

A convenience consumer sample including 809 consumers from four cities in the South of Vietnam (HoChiMinh, Cantho, Nhatrang and Dalat) is the data used in this study. The questionnaires, including the questions about attitudes towards fish consumption, were distributed to the persons who are mainly responsible for shopping and preparing the family meals in the households. The sample was focusing on the population regarding age (above 18), gender, married status, education, family income, region, and the size of households.

The average family income in the sample is between 5 and 6 million VND and the average age of respondents is 37 years old. 61.8 percent of the respondents are married, 38.2 percent were single. 54 percent of the households are with four to five persons. The sample distribution is 35.8 percent in Nhatrang, 19.8 percent in HoChiMinh, 18.7 percent in Cantho and 25.7 percent in Dalat city. The respondents were divided into two groups depending on whether they were graduated from high school or not (categories of low education with lower or equal high school and high education with higher high school). Altogether 72.4 percent of respondents are female. Female are affirmed more involved in food behavior/preparing in their families and hence are more representative decision maker regarding meals in the households (Tuu et al, 2008). The table 3.1 shows details of the sample.

Table 3-1: Social-demographic characteristics of the sample (% of respondents, n = 809)

Gender	Male	27.6	Family size	1 - 3 persons	25.1
	Female	72.4		4 - 5 persons	54.0
				more than 5 persons	20.9
Education	Low education	51.3	Family income (VND per month)	less than 3 mills	21.6
	High education	48.7		3 - 5 mills	36.2
Age	18 - 30	36.7		more than 5 mills	42.2
	31 - 45	35.8	Location	Nhatrang	35.8
	over 45	27.4		HoChiMinh	19.8
Marital status	Single	38.2		Cantho	18.7
	Married	61.8	Dalat	25.7	

3.2. Measurements of constructs

Perceived quality was measured based on study done by Olsen, Prebensen & Larsen (2008) with eight semantic differential scales (seven-point): (1) low quality – high quality, (2) bad taste - good taste, (3) bad texture – good texture, (4) bad appearance – good appearance, (5) bad smell – good smell, (6) unhealthy – healthy, (7) innutritious - nutritious, (8) expensive price – reasonable price. The standardized z-scores for the perceived quality were used in the subsequent cluster analysis. Seven *demographic measures* were used to classify the segment in this study including: sex, age, married status, family income, size of household, education and the cities they live.

Subjective ambivalence was measured by three items on a seven-point Likert scale anchored by disagree strongly (-3), neither disagree nor agree (0) and agree strongly (+3): ‘I have mixed feeling about eating fish’, ‘My thoughts of eating fish are conflicting’, ‘I have both positive and negative thoughts of eating fish’ (Conner & Sparks, 2002) .

Involvement is often measured by words expressing the importance, relevance, caring, concern, or interests linked to the attitude object, issue or action (Olsen, 2007). Because health is an attitude object, Pieniak et al., (2008b) measured health involvement using three items: ‘Health is very important to me’; ‘I care a lot about health’ and ‘Health means a lot to me’. Based on both studies, *health involvement*, in this study, was

measured by the three statements: 'I think of myself as a health-conscious person', 'I think of myself as a person who is concerned about the long-term effects on my food choice' and 'I am probably the most health-conscious person in the family'. All these items were scored on a seven-point Likert scale anchored by totally disagree (-3) to totally agree (+3).

The construct of *social norms* was performed including both specific person and the family as reference groups (Ajzen, 1991; Verbeke & Vackier, 2005; Olsen, 2007) and measured by four statements: 'People who are important to me want me eating fish regularly', 'My family wants me to eat fish regularly', 'My family expect me eating fish regularly' and 'My children expect me to have fish regularly for meals'. These items were measured on a seven-point Likert scale anchored by disagree strongly (-3) to agree strongly (+3).

Olsen (2001) measured *perceived moral obligation* for family's health with two statements: 'I am the one who takes care that we eat healthy food' and 'I try to give my family nutritious food', these items take account of personal feelings of 'responsibility' and 'obligation'. In this study, *moral norms* was measured by the three statements using a seven-point Likert scale anchored by disagree strongly (-3) to agree strongly (+3): 'I feel obligated to serve fish for my family', 'I would feel guilty if I did not serve fish for my family' and 'I buy fish to give my family nutritious meal'.

Perceived product convenience was measured by three seven-point semantic differential items: 'How much time would it take you to prepare fish for meal? (From 1 = a lot of time to 7 = very little time); 'How much difficult to prepare fish for meal? (From 1 = difficult to cook to 7 = easy to cook) and 'How much difficult to cook fish in many ways?' (From 1 = difficult to cook in many ways to 7 = easy to cook in many ways) (Jaeger & Meiselman, 2004; Olsen et al., 2007).

Knowledge and skill was measured by three items on a seven-point Likert scale anchored by disagree strongly (-3) to agree strongly (+3): 'I find it easy to prepare delicious and tasty meals with fish'; 'I can prepare many different dishes from fish' and 'I have a lot of knowledge of how to prepare fish for dinner' (Verbeke & Vackier, 2005).

Fish consumption is based on a one-year time frame and were addressed by a seven-point scale in the form: 'How many times - on average - during the last year have you eaten fish

for meal': 7 = 12 times or more a week, 6 = 9 to 11 times a week, 5 = 7 to 8 times a week, 4 = 5 to 6 times a week, etc., down to 1 = never (Honkanen et al., 2004).

3.3. Data analysis procedures

The data were analyzed using several analysis techniques, briefly described as two stage operation. First stage, cluster analysis (SPSS version 16.0) was used to identify segments of consumers based on perceived quality, health involvement and ambivalence for fish consumption. Based on the study carried out by Clatworthy et al., (2005), procedure chosen for a cluster solution is performed by four steps. Firstly, the similarity measure is performed by using squared Euclidean distance. Secondly, one of the hierarchical cluster analysis (Ward's minimum variance method) is used to obtain a first approximation of a solution. Thirdly, the procedure used to determine the number of groups in the data is the Agglomeration schedule and the Dendrogram. Finally, the validation procedure is performed to examine both the stability and validity of the clusters. In terms of cluster stability, the analysis is randomly dividing the data into two samples and applying the described procedures to verify the accuracy of the solution. In terms of validity, the repeated K-means with different starting seeds is used to examine the validity of the final solution. For this procedure, Punj and Stewart (1983) reviewed that "the cases are reassigned by moving them to the cluster whose centroid is closest to that case. Reassignment continues until every case is assigned to the cluster with the nearest centroid. Such a procedure implicitly minimizes the variance within each cluster".

A discriminant analysis is also conducted to test the final clustering solution. The objectives of performing discriminant are to evaluate the accuracy of classification and to determine which predictor variables contribute to most of the inter-group differences.

The second stage in the analysis was to provide a meaningful profile of the clusters. The appropriate analysis procedures depend on different scale measurements. Hence, to profile social-demographics the Crosstabs procedure was used. This procedure forms the two-way table (demographic variables specified as rows and segments specified as columns) and provides the tests and measures of association between the demographic variables and the clusters. The Chi-square tests were used to test whether there existed a relation between the social-demographic variables and the clusters or not. Following this, we used the multinomial logit analysis (MLA) with each social-demographic variable as independent variable, and cluster membership as dependent variable. The objective of

performing MLA was to determine the estimated coefficients of belonging to each specific segment. The **Odds ratio** device generalized from the estimated coefficients was also used to identify the change of the ratio between the probability of category j compared to the probability of basic category (Hill, Griffiths and Lim, 2008). These estimations were done by using SPSS 16.0 software. The last analysis, profiling social norms, moral obligation, perceived convenience and fish consumption were done by analysis of variance (ANOVA) with Scheffe multiple comparison post hoc tests differences in group means between segments.

The next part will present the results of analysis procedures.

4. RESULTS

4.1. Cluster identification

A hierarchic cluster analysis was performed first to get an indication of the proper number of clusters. Ward's method was used to maximize within-cluster homogeneity. The Dendrogram and the increase in agglomeration coefficient indicated a three-cluster solution as the most appropriate. A K-means procedure was conducted with three-cluster solution to examine the validity of the final solution. For stability of three-cluster solution, the data samples were randomly divided into two samples and the K-mean procedure was run again to confirm the accuracy of the result. Table 4.1 shows the final cluster solution including three clusters.

The first cluster, being the largest segment, was named the Satisfied, consisting of 332 of the respondents (41 percent) in the households. This segment represented the households who were clearly positive in quality perception and involved in healthy eating in their responses to eating fish. On ambivalence, their responses were clear and indicated that no conflicting thoughts on fish consumption. The second largest segment was named the Ambivalent, consisting of 253 (31 percent) of the respondents. These were characterized by a positive rating on perceived quality and health involvement, but they also revealed ambivalence simultaneously, reflecting the conflicting thoughts on fish consumption. The third segment was named the Neutral, and consisted of the remaining 224 (28 percent) of the respondents. This segment represents households who were somewhat rating positively on nutrition value of fish and they were involved in healthy eating, but their mean scores are close to the midpoint of the seven-point Likert scale on variables of taste preferences and ambivalence, they neither liked nor disliked eating fish as well as they are uncertain whether they have ambivalent attitudes towards fish consumption or not. The term "Neutral" was used for this group, because of these descriptions above. However, I am aware of that other study (Verbeke et al, 2007) use the term "Uncertain" for a group somewhat between Self-confident and Uninvolved groups towards fish consumption.

Table 4-1: Summary statistics of cluster solutions

Segment	Satisfied (41%)	Ambivalent (31%)	Neutral (28%)
<i>Perceived quality</i>			
Low / High quality	2.0	1.7	0.3
Bad / Good taste	2.2	2.0	0.2
Bad / Good texture	1.9	1.8	0.0
Bad / Good appearance	1.9	1.8	-0.1
Bad / Good smell	2.1	2.0	0.2
Bad / Good for health	2.6	2.5	1.2
Not nutritious / Nutritious	2.6	2.5	1.3
Expensive / Reasonable price	1.6	1.5	0.6
<i>Ambivalence</i>			
I have mixed feelings about eating fish	-1.8	0.6	0.0
I have mixed emotions toward eating fish	-1.9	0.8	0.0
My thoughts about eating fish are both positive and negative	-1.7	0.9	0.3
<i>Health involvement</i>			
I think of myself as a health-conscious person	2.0	1.9	0.9
I think of myself as the sort of person who is concerned about the long-term effects of my food choice	1.9	1.8	1.0
I am probably the most health-conscious person in the family	1.6	1.6	0.5

* The cluster descriptors are based on standardized scores that have zero mean and a standard deviation of one.

A solution with three segment was chosen by using the cluster analysis. However, one of objectives of the present thesis is to look at the underlying structure of the segment solutions what the most important predictors were in terms of determining classification in a specific segment. Thus, an added analysis – discriminant analysis is performed (Barnes et al., 2007).

4.2. Testing the clustering solution

To test the solution, a discriminant analysis was used. In this procedure, the segments are defined as the dependent variable, whereas the clustering characteristics represent the independent variables. The numbers in Table 4.2 indicated Eigenvalue associated with the first function (Satisfied segment) to be 2.08, and this function accounts for 65.53 percent of variance in the data. The second function (Ambivalent segment) has a smaller Eigenvalue of 1.10 and accounts for 34.47 percent of the variance. The Eigenvalue of the first function is larger, so it is likely to be superior. The canonical correlation associated with first function is 0.822, the square of it equals 0.676, indicating 67.6 percent of variance in the first dependent variable (Satisfied segment) can be explained by this model. Similarity explanation for the number of 0.723, its square is 0.523, indicating that 52.3 percent of variance in the second dependent variable (Ambivalent segment) is explained by this model.

Table 4-2: Results of the discriminant analysis

Function	Eigenvalue	% of variance	Cumulative %	Canonical correlation
1	2.08	65.53	65.53	0.82
2	1.10	34.47	100	0.72

Table 4-3: Results of the discriminant analysis

Test of function(s)	Wilks' Lambda	Chi-square	df	Sig.	Hit-rate (%)
1 through 2	0.155	1491.844	28	0.000	95.4
2	0.477	591.637	13	0.000	

The solution from Table 4.3 represents some results on discriminant functions. To assess the validity of the discriminant analysis the Hit ratio was calculated, indicating 95.4 percent of the original respondent groups were categorized correctly and confirms the very good fit of the three-cluster solution. In terms of determining the significance of the discriminant function, the values of Wilks' Lambda is 0.155, this transforms to the Chi-square of 1491.844, with 28 degrees of freedom, with a significant level of 95 percent. Thus, the two functions together significantly discriminate among the three groups. When the first function is removed, the values of Wilks' Lambda associated with the second

function is 0.477, transforming to the Chi-square of 591.637, with 13 degrees of freedom, with a significant level of 95 percent. Thus, the second function itself contributes significantly to group differences as well.

Table 4-4: Results of the discriminant analysis

	Univariate F (p)	df	Coefficient			
			standard		Coefficient	
			Fct 1	Fct 2	Fct 1	Fct 2
<i>Perceived quality</i>						
Low / High quality	178.01 (0.000)	2; 806	0.21	0.03	0.20	0.03
Bad / Good taste	310.58 (0.000)	2; 806	0.13	0.12	0.14	0.13
Bad / Good texture	257.40 (0.000)	2; 806	0.10	0.12	0.10	0.12
Bad / Good appearance	293.82 (0.000)	2; 806	0.18	0.19	0.18	0.19
Bad / Good smell	325.11 (0.000)	2; 806	0.21	0.16	0.22	0.17
Bad / Good for health	191.15 (0.000)	2; 806	0.11	0.19	0.13	0.22
Not nutritious / Nutritious	176.94 (0.000)	2; 806	0.10	0.12	0.12	0.14
Expensive / Reasonable price	44.31 (0.000)	2; 806	0.13	0.05	0.09	0.04
<i>Ambivalence</i>						
I have mixed feelings about eating fish	300.28 (0.000)	2; 806	-0.24	0.24	-0.19	0.19
I have mixed emotions toward eating fish	417.26 (0.000)	2; 806	-0.26	0.52	-0.23	0.45
My thoughts about eating fish are both positive and negative	301.03 (0.000)	2; 806	-0.36	0.25	-0.26	0.18
<i>Health involvement</i>						
I think of myself as a health-conscious person	61.51 (0.000)	2; 806	0.13	0.21	0.11	0.17
I think of myself as the sort of person who is concerned about the long-term effects of my food choice	39.37 (0.000)	2; 806	0.01	-0.09	0.01	-0.07
I am probably the most health-conscious person in the family	45.22 (0.000)	2; 806	0.07	0.20	0.05	0.14

Table 4.4 gives standardized discriminant function coefficients of the three-group of variables in the discriminant equations. The significance of the Univariate F-values demonstrates that when the predictors are considered individually, all the independent variables are significant in differentiating between the three groups. In the first discriminant function, there are two variables with the biggest coefficients: quality (0.21) and smell (0.21). Because both related to perceived quality attribute, the first dimension was labeled 'Satisfied'. Whereas, in the second function, the variable with largest coefficient "*I have mixed emotions toward eating fish*" (0.52) is associated with ambivalence attribute. Hence, the second dimension was labeled 'Ambivalent'.

4.3. Segment profiles

An examination of differences in the mean values of the consumption, convenience, social norms and moral obligation variables (dependent variables) between the segments (independent variable) was carried out using an analysis of variance (ANOVA). The numbers on the right side in Table 4.5 represents the ANOVA test on the group means of the profiled variables listing on the left. The variables listed in Table 4.5 are not measured on equal scales. The first variable is measured by seven-point scale, with the value from 1 to 7, this variable measures the level of fish-eating frequency per week, while all the rest of variables are measured the attitudes of the consumers using a seven-point Likert scale. The result from ANOVA indicated that the mean values of the dependent variables were statistically significantly different within a 95 percent confidence level for three segments. The numbers are interpreted as follows: e.g. second row, the 5.8, 5.7, 4.3 are simply the group means of *How much difficult to prepare fish for meal?* within each cluster. These numbers indicated that the households belong to Satisfied segment who believed that cook fish for meal is easier than the households belonging to Ambivalent and Neutral segments do.

The ANOVA *F* test examines only the overall difference in means. It is concluded that differences exists among the means if the null hypothesis of equal means is rejected, but only some of the means may be statistically different. Hence, we want to examine differences among specific means. Thus, a post hoc test with Scheffe multiple comparison was used for this purpose. The numbers under Scheffe multiple comparison tests indicated the p-value of an F-test on the mean differences in the Satisfied and the Ambivalent (S-A); the Satisfied and the Neutral (S-N); the Ambivalent and the Neutral

(A-N) segments. The results showed that there were statistically significant differences within a 95 percent confidence level between the Satisfied and the Neutral segments; and between the Ambivalent and the Neutral (A-N) segments as well. Meanwhile, there was not found statistically significant difference between two segments: Satisfied and Ambivalent.

Table 4-5: Profiling the different segments against statements about social norms, moral obligation, convenience and fish consumption (ANOVA-analysis)

	Clusters			ANOVA		Post Hoc		
	(mean values)			F-value*	Sig.*	Scheffe multiple comparison tests		
	S	A	N			S-A**	S-N**	A-N**
<i>Fish consumption</i>								
How often do you eat? At home	4.6	4.4	3.8	21.8	0.000	0.225	0.000	0.000
<i>Convenience</i>								
<i>Perceived convenience</i>								
Difficult / Easy to prepare	5.8	5.7	4.3	89.1	0.000	0.814	0.000	0.000
Slowly / Quickly prepare	5.6	5.3	4.2	66.9	0.000	0.188	0.000	0.000
Difficult / Easy to cook in many ways	5.8	5.6	4.4	80.1	0.000	0.459	0.000	0.000
<i>Knowledge and skill</i>								
I find it easy to prepare delicious and tasty meals with fish	5.4	5.2	4.1	46.4	0.000	0.563	0.000	0.000
I can prepare many different dishes from fish	5.6	5.5	4.5	42.5	0.000	0.848	0.000	0.000
I have a lot of knowledge of how to prepare fish for dinner	5.0	5.0	3.8	43.3	0.000	0.996	0.000	0.000

Table 4.5 (Continued)

	Clusters			ANOVA		Post Hoc		
	(mean values)			F-value*	Sig.*	Scheffe multiple comparison tests		
	S	A	N			S-A**	S-N**	A-N**
<i>Social norms</i>								
People who are important to me want me to eat fish regularly	5.6	5.4	4.6	35.4	0.000	0.111	0.000	0.000
My family want me to eat fish regularly	5.4	5.2	4.7	21.7	0.000	0.324	0.000	0.000
My family expect me to ate fish regularly	5.7	5.5	4.8	31.1	0.000	0.228	0.000	0.000
My children want me to have fish regularly	5.3	5.1	4.4	33.8	0.000	0.122	0.000	0.000
<i>Moral obligations</i>								
I feel obligated to serve fish for my family	5.5	5.4	4.5	36.9	0.000	0.836	0.000	0.000
I would feel guilty if I didn't served fish to my family	4.9	4.9	4.1	19.0	0.000	0.996	0.000	0.000
To serve a nutritious meal for my family, I buy fish	5.8	5.6	4.8	38.4	0.000	0.046	0.000	0.000

* F-value and Sig. of ANOVA

** Sig. of Scheffe multiple comparison tests

The significant level of 95%

Note: S=Satisfied; A=Ambivalent; D=Dissatisfied

Further examination of the differences between three segments with social-demographics was performed by cross-tabulation analysis. The numbers in Table 4.6 are the results from Crosstabs procedure. The variables are all dummy variables. The numbers are interpreted as follows: e.g. third row, 27.6, 29.2, 26.5 and 26.3 are simply the group means of the profiled variable gender, i.e. male within each column, indicating that 29.2%, 26.5% and 26.3% of respondents within Satisfied, Ambivalent and Neutral segments respectively are male. However, a test of Pearson Chi-Square indicated that gender variable do not significantly contribute to explain the differences between the

segments. The identified consumer segments differ from each other regarding the social-demographic variables of marital status, family size, age and location, whereas there are no statistically significant differences in gender, education and family income.

Table 4-6: Characteristics (group mean values) of demographic, by three segments

Characteristics	Total	Satisfied	Ambivalent	Neutral
Number of cases	809	332	253	224
Gender				
Male	27.6	29.2	26.5	26.3
Female	72.4	70.8	73.5	73.7
Marital status				
Single	38.2*	39.5*	33.6*	41.5*
Married	61.8*	60.5*	66.4*	58.5*
Family size				
1 - 3 persons	25.1**	24.4**	23.3**	28.1**
4 - 5 persons	54.0**	59.0**	53.4**	47.3**
More than 5 persons	20.9**	16.6**	23.3**	24.6**
Age (years)				
18 - 30	36.7***	31.9***	32.0***	49.1***
31 - 45	35.8***	36.4***	37.9***	32.6***
Over 45	27.4***	31.6***	30.0***	18.3***
Location				
Nhatrang	35.8***	35.2***	40.7***	31.2***
HoChiMinh	19.8***	14.5***	23.3***	23.7***
Cantho	18.7***	21.4***	14.6***	19.2***
Dalat	25.7***	28.9***	21.3***	25.9***
Education				
Low education	51.3	51.5	51.0	51.3
High education	48.7	48.5	49.0	48.7
Family income (VND per month)				
Less than 3 mills	21.6	19.6	24.1	21.9
3 - 5 mills	36.2	34.3	32.4	43.3
More than 5 mills	42.2	46.1	43.5	34.8

(Note: dummy variable with listed category equal to 1; * Significant at the 20% level; ** Significant at the 5% level; *** Significant at the 1% level.)

In order to gain a better understanding of the consumer clusters, a further statistical analysis multinomial logistic regression was conducted on these social-demographic variables. As shown in Tables 4.7 and 4.8, the multinomial logistic regression model was highly significant (0.001), with a Chi-square of 52.873 and 24 degrees of freedom. The variables of location, age, and family income were the most important indicators accounting for overall differences between the Neutral cluster and other clusters at 10 percent level of significance. Overall, gender, marital status, size of family and education were not significant.

Table 4-7: Model fitting information for multinomial logistic regression

Model	- 2 log likelihood	Chi-Square	df	Sig.
Intercept Only	1117			
Final	1064	52.873	24	0.001

Table 4-8: Likelihood Ratio Tests

Effect	- 2 log likelihood of reduced model	Chi-Square	df	Sig.
Intercept	1064	0.000	0	0.000
Gender	1064	0.448	2	0.799
Marital status	1065	1.045	2	0.593
Location	1079	15.594	6	0.016
Age	1084	20.151	4	0.000
Education	1066	2.062	2	0.357
Family size	1066	2.374	4	0.667
Family income	1073	8.894	4	0.065

\

Table 4-9: Multinomial logit regression of segments on selected independent variables

Characteristics	Satisfied		Ambivalent	
	B	EXP(B)	B	EXP(B)
Intercept	-0.164		-0.738**	
Gender				
Female	--	1.000	--	1.000
Male	0.121	1.128	0.001	1.001
Marital status				
Married	--	1.000	--	1.000
Single	0.022	1.023	-0.174	0.841
Family size				
1 - 3 persons	--	1.000	--	1.000
4 - 5 persons	0.186	1.205	0.079	1.082
More than 5 persons	-0.051	0.951	0.125	1.133
Age (years)				
18 - 30	--	1.000	--	1.000
31 - 45	0.512**	1.668	0.714***	2.042
Over 45	0.934***	2.545	1.066***	2.904
Location				
Dalat	--	1.000	--	1.000
Nhatrang	0.045	1.046	0.547**	1.728
Cantho	-0.106	0.900	0.180	1.197
HoChiMinh	-0.592**	0.553	0.269	1.308
Education				
Low education	--	1.000	--	1.000
High education	0.166	1.181	0.310*	1.363
Family income (VND per month)				
Less than 3 mills	--	1.000	--	1.000
3 - 5 mills	-0.114	0.892	-0.359*	0.699
More than 5 mills	0.446*	1.562	0.201	1.223

Note: The reference category is Neutral segment. Values of 1 are the reference category

* Significant at the 20% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 4.9 presents the estimated parameters from multinomial logistic regression models. The dependent and independent variables are all dummy variables. Because of the nonlinear functional form of the logit model, the parameter estimates is not interpreted straightforward. However, the signs of coefficients tell us the direction of the effect on the joint probabilities. If the coefficient for a certain segment is positive, the effect on the joint probability for this segment is positive relative to the omitted category (in this case category 3: Neutral consumer segment). An interpretation based on these coefficients is the **Odds ratio**. It shows how many times more/less likely the Satisfied or Ambivalent categories are chosen relative to the Neutral segment. Thus, the numbers are interpreted as follows: e.g. the coefficients of 0.512 and 1.668 on the variable age of 31 – 45 implies that being a person between 31 and 45 years old increases the probability of being a Satisfied consumer on fish consumption compared to probability of being a Neutral one by 1.668 times, keeping all other factors constant. Similarity, the numbers of -0.592 and 0.553 on the variable location of HoChiMinh city mean that a household living in HoChiMinh city decreases the probability of being a Satisfied consumer on fish consumption compared to probability of being a Neutral one by 0.553 times, keeping all other factors constant.

The findings indicate that, at least for this sample of four cities of Vietnamese consumers, there are several distinctions of fish consumption behavior. For these distinctions, the three segments: Satisfied, Ambivalent and Neutral consumer segments are discussed in detail based on the profiling variables. The subsequent sections highlight the main findings.

4.3.1. Consumption

As expected, Satisfied consumers have higher frequency in eating fish at home than consumers in other two segments have. The consumers in Neutral segment eat fish with lowest frequency. The analysis showed an average of 4.6 times of eating fish as the meal per week by Satisfied consumers, 4.4 times by Ambivalent consumers and 3.8 times by consumers in Neutral segment. However, there was no significant difference found in fish consumption between Satisfied and Ambivalent segments, but differences between Neutral and Satisfied or Neutral and Ambivalent segments were significant. One explanation for this is that although the consumers in Ambivalent segment have conflicting thoughts regarding eating fish, they do not deny the benefits of consuming

fish. So they eat fish as the meal not much less than Satisfied consumers, but much more than Neutral consumers do.

4.3.2. Convenience

In terms of perception of convenience towards preparing fish as the meal, it was found that while the Satisfied and the Ambivalent segments are confident in cooking of fish, then the Neutral segment is uncertain about the convenience of fish. The Satisfied and Ambivalent believed that cooking fish is not difficult and taking a short period of time. They can easily to cook fish in many different ways. Fish is not considered as an inconvenient food by these groups. This can be explained by their knowledge of how to prepare fish for meals. Meanwhile, the Neutral consumers thought of cooking fish is not difficult but not easy; neither slowly nor quickly. They admitted that they lack experiences and skills for preparing fish for dinner.

4.3.3. Social norms and moral obligations

Satisfied consumers thought that they have responsibility in serving fish for their family as nutritious meals. And for them, the pressure or expectations from their family on their eating behaviors had a positively significant influence. By contrast, the consumers in Neutral segments were only just motivated on their fish-eating behavior. They also believed that they have obligation or responsibility for serving fish to their family with lowest scores. In comparison to the other segments, the Ambivalent consumers scored these variables lower than the Satisfied consumers but higher than the Neutral consumers.

4.3.4. Demographics

The specific demonstrations of the differences in the three clusters are as follow: there are clear tendencies in marital status distribution among the segments, even though most of the respondents were married. The most married people belong to the Ambivalent segment, while the most single persons are in the Neutral group. Young consumers between age of 18 – 30 do not belong to the clusters of Satisfied or Ambivalent but rather to the Neutral, whereas consumers 31 – 45 years olds are mostly in Ambivalent group and consumers over 45 years old are found in the group of Satisfied. A look at the household size differences between three clusters revealed that the households with 4 to 5 persons seem the most satisfied in eating fish as the meal. Also, the households with 1 – 3 persons

or more than 5 persons are in the Neutral segment. Most of respondents are located in Nhatrang, next are Dalat and HoChiMinh respectively, while the amount of respondents are the smallest in Cantho. However, most of Satisfied consumers live in Cantho and Dalat, while consumers living in Nhatrang belong to Ambivalent segment and consumers living in HoChiMinh City belong mostly to the Neutral segment.

In terms of individual cluster differences. Age and level of education reflect that more experience and knowledge may influence positively the attitudes towards eating fish. The findings indicated that the probability of responding positively to the being a Satisfied or an Ambivalent consumer increases with age. This, in turn, shows that the older consumers are the more satisfied in their likings towards eating fish. The regional variable is significant in explaining the difference consumers' attitudes towards fish consumption behavior between three segments. The probability of responding negatively to Satisfied segment was related to the consumers living in HoChiMinh city, while the consumers living in Nhatrang were strongly positively related to Ambivalent segment in comparison with Neutral segment. In terms of income of family, the households with high income increase the probability of being a Satisfied consumer, while the households with medium income decrease the probability of being an Ambivalent consumer rather than being a Neutral consumer.

4.3.5. Summary of the segments

The Satisfied consumers (41 percent)

The consumers within this segment seem to find fish having more benefits than other two segments. In terms of perceived quality of fish, the satisfied consumers evaluated highest on fish's quality attributes, they were more affirmative and less dissatisfied. In comparison with the other segments, the Satisfied consumers did not have ambivalence or conflicting thoughts regarding eating fish. This group is the most involved in eating healthy food. The Satisfied are likely oldest consumers, with highest level of income, mainly living in Cantho and Dalat, and with households of 4 to 5 persons.

The satisfied consumers seem to feel more convenience in preparing fish for meal than other segments do. They believed that they have knowledge and skills to prepare and to cook fish. As the result, for them cooking fish is easy and taken a short of period time, and they can from fish cooking many dishes. They receive supports for eating fish from

their family and their important persons. And they appraise highly their responsibilities in serving fish for family as nutritious meals. As expected, Satisfied consumers are most frequency in eating fish at home.

The Ambivalent consumers (31 percent)

These respondents are rather ambivalent about eating fish, but they perceive fish have a good quality (e.g. good taste, good smell and high nutritional value). This group is also involved in healthy eating. But they were not completely ready for eating fish as the meal because of the mixed emotions towards eating fish. Most consumers in this segment are married, they are in group of 31 – 45 years olds and living in Nhatrang with lowest level of family income.

As noticed above, the results from the ANOVA technique showed that there were no significant differences between Ambivalent and Satisfied segments on the variables of convenience, social norms, moral obligation and fish consumption. One would think that the Ambivalent consumers would perceived fish as inconvenient but the opposite was found. The reason that the Ambivalent consumers believed fish is convenient food can be explained based on their knowledge about preparing and cooking fish. Concerning eating of fish, the Ambivalent consumers also receive encouragement and expectations from their important person and their family members towards consuming fish. They show a high moral responsibility to prepare fish for the family. This group eats fish not much less than Satisfied consumers, but much more than Neutral consumers do.

The Neutral consumers (28 percent)

The primary characteristics of the consumers within the Neutral group were that the Neutral consumers are uncertain of their mixed feelings towards fish consumption, they neither believed that they have conflicting thoughts towards eating fish nor thought that they did not have mixed feelings about eating fish. The Neutral consumers acknowledge fish is a healthy and nutritious food, but feel uncertain with respect to the evaluation of fish quality. Therefore, they seem to be less involved in eating healthy food than others do.

The Neutral consumers considered fish as neither convenient food nor inconvenient food. This can be explained based on their lack of experiences and skills for preparing fish for

dinner. The respondents in this group have very little obligation and responsibility about serving fish for their family and they are slightly less motivated in consuming fish by comments of their family members or other important people. In comparison to the other segments, consumers in Neutral segment eat fish at lowest level. The explanation for these findings are most likely that this group are young consumers between age of 18 – 30 years and most of them are single persons. This segment live mostly in HoChiMinh City.

5. DISCUSSION AND IMPLICATIONS

This study is the first attempt to segment the fish consumer market in Vietnam using attitudes of consumers towards fish products. These findings suggest that using attitudinal ambivalence as a basis for benefit segmentation is an appropriate choice for profiling consumers in fish market. The results reveal three consumer segments based on product benefits of perceived quality, ambivalence and health involvement towards fish product: the 'Satisfied', the 'Ambivalent' and the 'Neutral' consumer segments. The quality and the smell of fish are found as the main variables contributing to determine the classification of the Satisfied segment. For determining the classification of the Ambivalent segment, the variable of "*mixed emotions*" is found as the most important. The results are proved to be valid and relevant for practical and research purposes. These results are in accordance with one earlier study (Olsen et al., 2008) confirming that the attitudinal ambivalence of consumers towards food can be classified into one group named Ambivalent group. The Ambivalent consumers share attitudes and behavior towards fish products somewhere between the Satisfied and the Neutral segments on most variables. However, they are similar to the "Satisfied" on most areas, e.g. perceived quality, health involvement, perception of fish convenience, social and moral norms.

The findings in this thesis show that Vietnamese almost all believed fish is healthy food and they are involved in healthy-eating. However, their preferences, attitudes and behavior towards fish-eating are at different levels as well as their knowledge about how to cook fish for dinner with different limiting cooking skills.

The largest segment, Satisfied consumers, accounted for 41 percent of the consumption market, including people in the age group of over 45, with high income and positive attitudes and preferences towards fish consumption. They are satisfied with eating fish and they consider fish as a nutritious food. However, a healthy diet can be made up by combination of different foodstuffs, which may or may not include fish (Olsen, 2004). The people, who are motivated to healthy eating, can serve their family a number of substitutes, such as chicken, beef, vegetarian food or other nutritious food (Olsen (2001; Verbeker & Vackier, 2005). Thus, the Satisfied segment seem to be the most important segment for the fish industry as their target market, now and in the future. Some marketing efforts should be performed towards this segment to increase the satisfaction, the loyalty and the consumption of fish products, such as well promoted brand names,

warranties, packaging attributes, information about origin, product content and production (Olsen, 2004).

The smallest segment, consisting of 28 percent of the market, is the Neutral consumer. They seem to have neither positive nor negative attitudes towards eating fish. They perceive fish as being of medium in quality as well as in the sensory aspects (smell, taste, texture and appearance). However, they evaluate fish as nutritious food and they are obviously involved in healthy eating (same as the Satisfied and Ambivalent). This supports the results of Pieniak et al., (2008b) that consumers in general are very involved with their health and very interested in healthy eating, particularly in fish consumption. In terms of the price of fish, the present thesis showed that this group do not perceive fish as expensive, rather it is reasonable (same as the Satisfied and Ambivalent). This finding is opposite to some studies on fish consumption in developed countries, where the consumers believed that fresh fish is high price product (Myrland et al., 2000; Trondsen et al., 2003).

The Neutral consumers are in the young age group (between 18 and 30 years), with most in the single-household group and almost all living in HoChiMinh City. They claimed that cooking fish is neither easy nor difficult, neither taken a lot of time nor less time, but that they have less knowledge of preparing fish for dinner. The latter could point to the fact that Neutral consumers cook fish based on their habit, but lack of skills. So they need adequate cooking skills for preparing fish dishes. Hence, fish industry should present Neutral consumers with improved products – products that satisfy the variety of needs of consumers (i.e. better tastes and preferences), like processed fish dishes such as fish cakes, fish balls, burgers and chunks (Trondsen et al., 2003). These products will have a big potential as a healthy alternatives to hamburgers and other fast foods to satisfy health-oriented people with limited cooking skills. In addition, manufacturers of frozen products can supply the market with products that are supplied with a of lot of different cooking recipes. However, fresh fish does not come with instructions like frozen products, therefore the marketers should inform about reference sources such as recipe books, in-store recipe cards, food magazines, etc., so that consumers may refer to these sources to obtain a recipe and prepare a meal for themselves (Leek et al., 2000).

Despite the mixed feelings the Ambivalent consumers have towards fish-eating, they do somewhat perceive convenience in terms of cooking and preparing fish for their family

meals. This is opposite to the findings of Olsen (2004), who suggested that fish is considered as nutritious food but inconvenient (e.g., time using, stages of process, ingredients). These different results maybe caused by the ambivalence in consumers' attitudes when consuming fish. However, this thesis supports Olsen (2003) who did not confirm any significant relationship between perceived convenience of fish and fish consumption in Norway. The Ambivalent consumers almost have positive perception towards fish quality, they considered fish is good taste as well as good smell. Whereas, consumers across different countries almost perceived fish as having bad smell (unpleasant and lingering long after cooking and ingestion) (Olsen, 2004), but good taste (Verbeke & Vackier, 2005). It can be said about the Ambivalent consumers in Vietnam, they are more or less satisfied with eating fish although they have attitudes of ambivalence on fish consumption. This opposites to Olsen et al., (2005) who indicated a negative relationship between ambivalence and satisfaction, the more ambivalent consumers are the less satisfied they are.

For the Ambivalent consumers, fish is consumed not only for the reasons of responsibility or moral obligation, but for the perceived social pressures as well. These findings opposite earlier studies of Leek et al, (2000) and Olsen (2001) who suggested that between moral norms and social norms in attitudes of consumers towards eating fish may cause mixed feelings. Social norms could force people not to cook seafood as a family dinner if someone in the family does not want to eat fish. In spite of this, the moral obligation may lead them to serve fish to their family as a healthy meal. However, our findings are in accordance with Tuu et al., (2008) and Verbeke & Vackier (2005), showing that consumers' fish-eating behaviour in Vietnam and Belgium are motivated not only by family expectations, but also by the attitude and behaviour of people in their social environment.

Therefore, it can be concluded that the reasons causing the ambivalence in attitudes towards fish consumption by Vietnamese people are not because of perception of fish as inconvenient food or the conflict between moral norms and social norms.

Limitations and future research

To the best of my knowledge, I am not aware of any studies that have carried out fish consumer segmentation in Vietnam. I should, however, point out some limitations of this study. The present research is based on a convenience sample from four cities in the

South of Vietnam, so the result are not necessarily representative for the whole of the population. Future study should include a more representative sample in the North of Vietnam. Then the attitudes towards fish consumption for the whole of Vietnamese consumers can be explained more convincingly.

In this study perceived quality, ambivalence and health involvement towards fish consumption are significant in segmenting Vietnamese consumer market. Here the ambivalence in a consumers' attitudes towards fish is not due to the reasons that fish is nutritious but an inconvenient food or the conflict between moral norms and social norms which were indicated for Western consumers. Therefore, a research by in-depth interviews should be done in advance, before performing the questionnaires, to explore other "local" factors in Vietnam, causing the ambivalence towards eating fish, this may be necessary for the future research. In addition, additional constructs may possibly be added to the variables as the basis or profiling for segmentation to make clear about the attitudes of consumers in Vietnam towards fish consumption, such as negative effects like the bones, the scales, the danger of fish poisoning/risk (Olsen, 2004) and habit as profiling variable (Verbeke & Vackier, 2005).

References:

- Aikman, S. N., Crites, S. L. & Fabrigar, L. R. (2006). Beyond affect and cognition: identification of the informational bases of food attitudes. *Journal of Applied Social Psychology* 36(2), 340 – 382.
- Aikman, S. N. & Crites, S. L. (2007). Structure of food attitudes. *Appetite* 49, 516 – 520.
- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes* 50, 179 – 211.
- Assael, H. & Roscoe Jr., A. M. (1976). Approaches to market segmentation analysis. *The Journal of Marketing Research* 40 (4), 67 – 76.
- Barnes, S. J., Bauer, H. H., Neumann, M. M. & Huber, F. (2007). Segmenting cyberspace: a customer typology for the internet. *European Journal of Marketing* 41, 1/2, 71 – 93.
- Berndsen, M. & Pligt, J. (2004). Ambivalence towards meat. *Appetite* 42, 71 – 78.
- Brunso, K., Fjord, T. A. & Grunert, K. G. (2002). Consumers' food choice and quality perception. *Working paper no 77*, ISSN 0907 2101.
- Candel, M. J. J. M. (2001). Consumers' convenience orientation towards meal preparation: conceptualization and measurement. *Appetite* 36, 15 – 28.
- Clatworthy, J., Buick, D., Hankins, M., Weinman, J. & Horne, R. (2005). The use and reporting of cluster analysis in health psychology: A review. *British Journal of Health Psychology*, 10, 329 – 358.
- Conner, N. & Sparks, P. (2002). Ambivalence and Attitudes. *European Review of Social Psychology*, 12(1), 37 – 70.
- Conner, N., Povey, R., Sparks, P., James, R., & Shepherd, R. (2003). Moderating role of attitudinal ambivalence within the theory of planned behavior. *British Journal of Social Psychology*, 42, 75-94.

- Conner, N., Povey, R., Sparks, P., James, R., Shepherd, R. & Armitage, C. J. (2002). Moderator effects of attitudinal ambivalence on attitude-behavior relationship. *European Journal of Social Psychology*, 32, 705 – 718.
- Darian, J. C. & Cohen, J. (1995). Segmenting by consumer time shortage. *Journal of Consumer Marketing* 12 (1), 32-44.
- Drewnowski, A. (1997). Taste preferences and food intake. *Annual Reviews Nutrition* 17, 237 – 253.
- Anderson, J. G. & Anderson, J. L. (1991). Seafood quality: Issues for consumer researchers. *The Journal of Consumer Affairs* 25 (1).
- Gofton, L. (1995). Convenience and the moral status of consumer practices. In D. W. Marshall (Ed.), *Food Choice and the Consumer* (pp. 152-181). London, UK: Blackie Academic & professional.
- Gofton, L. & Marshall, D. W. (1992). Fish: A marketing problem. *Bradford: Horton Publishing*.
- Grunert, K. G. (2005). Food quality and safety: consumer perception and demand. *European Review of Agricultural Economics* 32 (3), 369 – 391.
- Green, P. E. (1977). A new approach to market segmentation. *Business horizons*.
- Haley, R. I. (1968). Benefit segmentation: A decision – oriented research tool. *Journal of Marketing* 32, 30-35.
- Jaeger, S. R. & Meiselman, H. L. (2004). Perceptions of meal convenience: the case of at – home evening meals. *Appetite* 42, 317 – 325.
- Foxall, G., Leek, S. & Maddock, S. (1998). Cognitive antecedents of consumers' willingness to purchase fish rich in polyunsaturated fatty acids (PUFA). *Appetite* 31, 391 – 402.
- Korgaonkar, P., Silverblatt, R. & Girard, T. (2006). Online retailing, product classifications and consumer preferences. *Internet Research* 16 (3), 267-288.

- Kim, J. O., Forsythe, S., Gu, Q., & Moon, S. J. (2002). Cross-cultural consumer values, needs and purchase behavior. *The Journal of Consumer Marketing* 19 (6), 481.
- Hill, Griffiths, E., & Lim, C. (2008). *Principles of econometrics*. Third Edition.
- Holm, L. & Kildevang, H. (1996). Consumers' views on food quality: A qualitative interview study. *Appetite* 27, 1 – 14.
- Honkanen, P., Olsen, S. O. & Myrland, O. (2004). Preference-based segmentation: A study of meal preferences among Norwegian teenagers. *Journal of Consumer Behaviour* 3(3), 235–250.
- Larsen, T. B. & Grunert, K. G. (2003). The perceived healthiness of functional foods: A conjoint study of Danish, Finnish and American consumers' perception of functional foods. *Appetite* 40, 9 -14.
- Li, H. S., Huston, J. E., Wang, S. M. & Lee, H. J. (2000). Factors affecting consumer preferences for fish in Taiwan. *In IIFET-Conference Proceedings*, Oregon State University.
- Leek, S., Maddock, S. & Foxall, G. (2000). Situational determinants of fish consumption. *British Food Journal* 102 (1), 18 – 39.
- Maenpaa, K. (2006). Clustering the consumers on the basis of their perceptions of the Internet banking services. *Internet Research* 16(3), 304 – 322.
- Matear, S. & Gray, R. (1995). Benefit segments in a freight transport market. *European Journal of Marketing* 29 (12), 43 – 58.
- Levin, A. M., Levin, I. P. & Heath, C. E. (2003). Product category dependent consumer preferences for online and offline shopping features and their influence on multi-channel retail alliances. *Journal of Electronic Commerce Research* 4 (3).
- Molera, L. & Albaladejo, I. P. (2007). Profiling segments of tourist in rural areas of South-Eastern Spain. *Tourism Management* 28, 757 – 767.
- Mozaffarian, D. & Rimm, E. B. (2006). Fish intake, contaminants, and human health: Evaluating the risks and the benefits. *Jama*.

- Myers, J. L. (1996), Segmentation and Positioning for Strategic Marketing Decision, *American Marketing Association, Chicago, IL.*
- Myrland, O., Trondsen, T., Johnston, R. S. & Lund, E. (2000). Determinants of seafood consumption in Norway: lifestyle, revealed preferences, and barriers to consumption. *Food Quality and Preference* 11, 169-188.
- Niense, J., Hyldig, G. & Laesen, E. (2002). Eating quality of fish – A review. *Journal of Aquatic Food Product Technology* 11.
- Oakes, M. E. & Slotterback, C. S. (2001). Gender differences in perceptions of the healthiness of foods. *Psychology and Health* 16, 57 – 65.
- O'Connor, P. J. & Sullivan, G. L. (1995). Market segmentation: A comparison of benefits/attributes desired and brand preference. *ProQuest Psychology Journals* 613.
- Olsen, S. O. (1999). Strength and conflicting valence in the measurement of food attitudes and preferences. *Food Quality and Preference* 10, 483 – 494.
- Olsen, S. O. (2001). Consumer involvement in seafood as family meals in Norway: An application of the expectancy – value approach. *Appetite* 36, 173 – 186.
- Olsen, S. O. (2003). Understanding the relationship between age and seafood consumption: the mediating role of attitude, health involvement and convenience. *Food Quality and Preference* 14, 199 – 209.
- Olsen, S. O. (2004). Antecedents of Seafood Consumption Behavior: An Overview. *Journal of Aquatic Food Product Technology* 13(3).
- Olsen, S. O., Scholderer, J., Brunso, K. & Verbeke, W. (2007). Exploring the relationship between convenience and fish consumption: A cross-cultural study. *Appetite* 49, 84 – 91.
- Olsen, S. O. (2007). Repurchase loyalty: the role of involvement and satisfaction. *Psychology & Marketing* 24(4), 315 – 341.
- Olsen, S. O., Prebensen, N. & Larsen, T. A. (2008). Including ambivalence as a basis for benefit segmentation: A study of convenience food in Norway. *European Journal of Marketing* (forthcoming).

- Olsen, S. O., Wilcox, J. & Olsson, U. (2005). Consequence of ambivalence on satisfaction and loyalty. *Psychology & Marketing*, 22(3), 247 – 269.
- Ophuis, P. A. M. O. & Van Trijp, H. C. M. (1995). Perceived quality: A market driven and consumer oriented approach. *Food Quality and Preference* 6, 177 – 183.
- Chetthamrongchai, P. & Davies, G. (2000). Segmenting the market for food shoppers using attitudes to shopping and to time. *British Food Journal* 10 (2), 81-101.
- Pieniak, Z., Verbeke, W., Cueto, F. P., Brunso, K. & Henauw, S. D. (2008a). Fish consumption and its motives in households with versus without self-reported medical history of CVD: A consumer survey from five European countries. *BMC Public Health* 8, 306.
- Pieniak, Z., Verbeke, W., Scholderer, J., Brunsø, K. & Olsen, S. O. (2008b). Impact of consumers' health beliefs, health involvement and risk perception on fish consumption: A study in five European countries. *British Food Journal* 110(9), 898 – 915.
- Povey, R., Wellens, B. & Conner, M. (2001). Attitudes towards following meat, vegetarian and vegan diets: an examination of the role of ambivalence. *Appetite* 37, 15 – 26.
- Punj, G. & Stewart, D. W. (1983). Cluster analysis in marketing research: Review and suggestion for application. *Journal of Marketing Research* 20(2), 134 – 148.
- Roininen, K., Lahteenmaki, L. & Tuorila, H. (1999). Quantification of consumer attitude to health and hedonic characteristic of food. *Appetite* 33, 71 – 88.
- Schiffman, L. G. & Kanuk, L. L. (2004). *Consumer behavior*. Eighth edition. Pearson Education International.
- Scholderer, J. & Grunert, K. G. (2004). Consumers, food and convenience: the long way from resource constraints to actual consumption patterns. *Journal of Economic Psychology* 26, 105 – 128.
- Sohail, M. S. & Shanmugham, B. (2003). E-banking and customer preferences in Malaysia: An empirical investigation. *Information Sciences* 150, 207–217.

Solomon, M. R. (2004). *Consumer behavior: Buying, Having, and Being*. Six edition. Pearson Education International.

Sparks, P., Conner, M., James, R., Shepherd, R & Povey, R. (2001). Ambivalence about health-related behaviors: An exploration in the domain of food choice. *British Journal of Health Psychology* 6, 53 – 68.

Steenkamp, J. B. E. M. (1986). Perceives quality of food products and its relationship to consumer preferences: theory and measurement. *Journal of Food Quality* 9(6), 373 - 386.

Stephens, A., Pollard, T. M. & Wardle, J. (1995). Development of a measure of the motives underlying the selection of food: the Food Choice Questionnaire. *Appetite* 25, 267 – 284.

Trondsen, T., Scholderer, J., Lund, E. & Eggen, A. E. (2003). Perceived barriers to consumption of fish among Norwegian women. *Appetite* 41, 301 – 314.

Tuu, H. H., Olsen, S. O., Thao, D. T. & Kim Anh, N. T. (2008). The role of norms in explaining attitudes, intention and consumption of a common food (fish) in Vietnam. *Appetite*, 51, 546-551.

Verbeke, W., Vermeir, I. & Brunso, K. (2006). Consumer evaluation of fish quality as basis for fish market segmentation. *Food Quality and Preference* 18, 651–661.

Verbeke, W. & Vackier, I. (2004). Profile and effects of consumer involvement in fresh meat. *Meat Science* 67, 159 – 168.

Verbeke, W. & Vackier, I. (2005). Individual determinants of fish consumption: Application of the theory of planned behavior. *Appetite* 44, 67 -82.

Vinson, D. E., Scott, J. E. & Lamont, L. M. (1977). The role of personal values in marketing and consumer behavior. *Journal of Marketing* 41(2), 44.

Warde, A. (1999). Convenience food: space and timing. *British Food Journal* 101(7), 518 – 527.

Wind, Y. (1978). Issues and advances in segmentation research. *The Journal of Marketing Research* 15(3), 317 – 337.

<http://faostat.fao.org>