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FACTORS INFLUENCING CONSUMERS’ PURCHASE INTENTION OF CHILLED FRESH MEAT IN VIETNAM

MASTER’S THESIS
FACTORS INFLUENCING CONSUMERS’ PURCHASE INTENTION OF CHILLED FRESH MEAT IN VIETNAM

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**ABSTRACT**

**Purpose** - The purpose of this research is to examine whether product information on label and traceability system can influence on consumer purchase intention towards chilled fresh meat in Vietnam.

**Methodology/ approach** – The major data instrument is the questionnaire survey methodology, which yielded a total of 104 valid responses. The hypothesized associations between all variables are investigated using structural equation modeling.

**Findings** – The finding shows that both label and traceability system are perceived to be useful tools for consumers to evaluate chilled fresh meat. The result also confirms the important role of traceability system in building consumer trust in product, and positively influencing on consumer attitude and purchase intention. However, this research found that label can impact on consumer trust only when product diagnosticity can be highly perceived by consumers. Finally, consumers are willing to pay a higher price for chilled fresh meat than normal meat.

**Implications** – Producers, marketers should provide more product information via label and traceability system to help consumers understand and evaluate accurately chilled fresh meat. In the context of food safety issues, producers should apply traceability system to provide transparent and credible information to consumers to build consumer trust in product.

**Value of the paper** – This research has examined the effect of both label and traceability system on purchase intention by incorporating critical factors based on previous research to gain a better insight of consumer behavior toward chilled fresh meat.

- **Keywords:** Labeling; Traceability System; Product Diagnosticity; Trust; Chilled Fresh Meat;
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CHAPTER 1. INTRODUCTION

1.1. Background of the research

In Vietnam, meat products such as pork, beef, poultry are daily food products in Vietnamese lives. The country's per capita consumption has been steadily increasing as shown in Table 1.1. In which, pork is the leading source of food for Vietnamese consumers among meat products. Particularly, Vietnamese per capita pork consumption was raised from 28.88kg/capital/year in 2016 to 29.72kg/capital/year in 2020 and forecasted to be 31.1kg/capital/year in 2026. The increase in pork demand as well as other meat products, stems from the increasing income of the people and the change in diet towards consuming more protein-rich products. In addition, the rapid urbanization rate has also been recognized as another reason for the increase in consumption of animal-based products.

Table 1.1. Human consumption of meat per capital in Vietnam

<table>
<thead>
<tr>
<th>Country</th>
<th>Viet Nam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Human consumption per capita (kg per capital)</td>
</tr>
<tr>
<td></td>
<td>Pig meat</td>
</tr>
<tr>
<td></td>
<td>Poultry meat</td>
</tr>
<tr>
<td></td>
<td>Sheep meat</td>
</tr>
</tbody>
</table>

Source: OECD (2017)

Despite a constant trend in meat sector growth over the last few years, meat production has not been able to keep up with demand. In Vietnam, farmers, slaughtermen, retailers, and consumers are the four primary stakeholders in the most typical meat value chain.
Livestock is bought from various farms, slaughtered by slaughtermen, and then sold to retailers for processing, finally, meat is delivered to the market for sales to customers (Nguyen et al., 2020). Family-owned farms with small-scale are still prevalent today in Vietnam. For example, the extremely small-scale household-based farmers with 1-5 pigs account for 84 percent of all farmers raising pigs in 2006 (Lapar et al., 2012). As a result, output levels and prices are unscalable, and breeder quality is inconsistent. Regarding meat processing, according to Department of Agriculture and Rural Development Hanoi, in 2018, there are 988 livestock slaughterhouses, 937 of which are family-run and have a capacity per day from 1 to 5 pigs slaughtered in Hanoi (Nguyen, 2019). Meat inspection and food hygiene is not practiced in most of these small-scale slaughterhouses. Retailers almost sell fresh meat at the traditional wet market where there is inadequate cleanliness and a significant risk of microbial contamination (Dang, 2019).

The most common type of meat in Vietnam is normal meat which has not been treated in any way to ensure its preservation, store at normal temperature, and delivered directly to traditional markets for sales within a day. Meats are frequently carried to the traditional markets on motorcycles without being covered, then put on the tables without packaging, which can lead to high risk of bacterial contamination (Yokozawa et al., 2016). Meat is directly cut and sold to consumers as their requirements on meat type and quantity. Consumers often cannot trace for the origin of the meat they buy. They do not know where and how the animals were raised up, and place, time and the method of production, transportation, and storage.

The second type of meat is frozen meat is fresh meat subjected to freezing in appropriate equipment to keep the product at a temperature of -18°C or lower at any time after freezing (Liu et al., 2017). This type of meat is often imported meat and selling in
supermarkets. However, texture and taste are not good as normal meat, it also takes long time to thaw before cooking.

The latest meat product which has been selling in the fall 2018 is chilled fresh meat. Chilled fresh meat is described as meat that were instantly cooled in the range from 0°C to 4°C within 24 hours after slaughter, and is preserved at this temperature during processing, transport, and storage at point of sales (Liu et al., 2017). Unlike normal meat, chilled fresh meat is packaged in adjusted or monitored environments to prevent microbial decay and spoilage, as well as to control food-borne pathogens. This is considered to be a better way to slow down microbial metabolism and development (Kropf, 2004). Thus, compared to normal meat, chilled fresh meat is expected to be more safety and more hygienic. It can be easily and quickly used without thawing as frozen meat.

In the world, chilled fresh meat is prevailed in developed countries in Europe, America for a long time. However, in developing countries, it is still a new product. In China, the consuming trend has been changing from normal fresh meat to frozen meat, then from frozen meat to chilled fresh meat (Zhou et al., 2012). In Vietnam, chilled fresh meat has been firstly introduced in the fall 2018 and selling only in big cities such as Hanoi, Ho Chi Minh City, Haiphong etc. However, from the development path of chilled fresh meat in the world as well as the quality advantages of chilled fresh meat, it is predicted to be more popular in next few years in conjunction with consumer awareness and Vietnam's rapid urbanization. Therefore, this study will focus on only chilled fresh meat.

1.2. Problem statement

In the context of food industry, food safety and hygiene issues have become the biggest concern among consumers and regulators. There is an explosion of food poisoning cases due to many reasons such as chemical residues, antibiotic residues in meat products, the
use of illegal additives, and pollution, contamination, and poor hygiene at the point of
sale. According to General Statistics Office of Vietnam, in 2020, there are 90 food
poisoning cases, 2,254 poisoned persons, in which, 22 died persons (GSO, 2020).
Microbial hazards and food-related health hazards such as Salmonella spp., foot-and-
mouth diseases, E. coli are major problems in Vietnam (Dang, 2019). Every year, around
5000 people are reported to have become ill as a result of food poisoning (Group, 2016),
however, this number is likely to be underestimated because of a poor level of reporting.
In this context, consuming high quality and safe products like chilled fresh meat can be
a good way to reduce food-related risks, however, the proportion of its consumption in
Vietnam has been still limited. In contrast, normal meat with high food safety and
hygiene risk is consumed day by day, for example, normal pork accounts for 90% of
daily consumption in Vietnam according to the Department of Livestock (An, 2021).

There might be some reasons for this situation. Firstly, normal meat can be easily
purchased at any traditional wet markets in Vietnam. Most of Vietnamese consumers
have a daily habit to go to markets near their houses and buy necessary goods for their
convenience. Meanwhile, to buy chilled fresh meat, they must find and go to the place
that selling it, because chilled fresh meat is sold only in modern trade channel, i.e.,
supermarkets, modern groceries, and specialty stores. Secondly, normal meat has lower
price than chilled fresh meat. Thirdly, the main differences between chilled fresh meat
and normal meat are credence attributes which are difficult for consumers to evaluate
by normal eyes. According to Nelson (1970) and Darby and Karni (1973), a product's
attributes may be separated into three categories: search, experience, and credence
attributes. Color, size, and price are examples of search attributes that buyers may
examine before making a purchase by looking at them directly. Experience attributes
however are difficult to assess without firsthand experience, requiring the consumption
of the product for correct judgments such as flavor and texture. However, credence attributes are those that customers cannot determine even after purchasing or using a product (Ford et al., 1988). Chilled fresh meat would be a credence good because of its manufacturing process, which distinguishes chilled fresh meat from normal meat, causes a significant number of chilled fresh meat traits to be credence attributes. Production techniques, health, and food safety characteristics (e.g., nutritional value, free of chemical residues), animal welfare, and environmental protection qualities, for example, are credence attributes of chilled fresh meat. Previous research also show that consumers are likely to have inadequate knowledge of food product and their production methods, thus, lack confidence when making purchase decisions (Verbeke & Ward, 2006). In addition, according to Demeritt (2002), limited understanding and awareness of goods are key hurdles to purchasing foods. That is, if customers lack the knowledge needed to understand the product and build confidence, they will not consider purchasing foods. Chilled fresh meat is a new product, without product information, it is difficult for consumers to distinguish the difference among 3 types of meat, especially normal meat, and chilled fresh meat. They also do not know why it has higher price than normal meat and the benefits of consuming it. As the result, they do not need to find and buy chilled fresh meat for higher price. The other important reason is that there are many serious food scandals, consumers are losing their confidence in food safety. Even though they can understand these differences between chilled fresh meat and normal meat, they might not trust in product and its benefits. Therefore, the main reasons which can explain for low proportion of chilled fresh meat are lack of product knowledge due to lack of product information, and lack of trust in product.

To solve these obstacles, Fernqvist and Ekelund (2014) claimed that unlike experience attributes, which can only be evaluated by actually using goods, search and credence
qualities are those whose information is best given through other sources, such as word of mouth, quality labels, advertising and catalogs, rather than direct product trial. Quality signaling, such as beef labeling, can convert credence attributes into search attributes and enhance customer trust, reducing consumer perceptions of risk associated with meat safety and quality, and asymmetry of information between consumers and manufacturers (Mojduszka & Caswell, 2000; Nelson, 1970). Thus, providing food safety and product related information has become critical to increase consumers’ awareness, and trust in product, then positively impact on their purchase intention. Several forms of information systems have been proven in previous study to help reduce information asymmetry between suppliers and consumers (Pavlou & Fygenson, 2006). For example, labeling is a traditional technique of providing food information, and it continues to play a vital role in communicating with customers (Kehagia et al., 2007). However, the quantity of information that can be given is limited by the space limitations of basic paper labels. Because of advancements in technology and technologies, nowadays consumers may get information about the manufacturing location, manufacturer, time, and other specifics of the production and delivery process from food traceability systems (Yoo et al., 2015). Thus, food traceability systems seem to have a much better capacity to offer food quality and safety information (Jin & Zhou, 2014). In this research, the influence of revealed information on both label and traceability system on consumer purchase intention of chilled fresh meat will be examined to find out whether this relationship exists.

1.3. Research objectives

There are three main objectives of this research. The first objective is to examine whether product information provided by label and traceability system can be useful tools for consumers to evaluate chilled fresh meat. The second objective is to investigate whether product information provided by label and traceability system can build
consumer trust in product. The final objective is to examine whether product information provided by label and traceability system can influence on consumer purchase intention of chilled fresh meat.

Research questions:

1) Is product information provided by label and traceability system useful for consumers to evaluate chilled fresh meat?

2) Does product information provided by label and traceability system create consumer trust in product?

3) Does product information provided by label and traceability system influence on consumer purchase intention?

4) How much are consumers willing to pay higher for chilled fresh meat?

1.4. Scope of the research

Firstly, this study focuses only on chilled fresh meat products such as pork, beef, and chicken which are currently selling in Vietnam. Secondly, in the marketing literature, there might be many factors that can influence on consumer purchase intention; however, as mentioned in problem statement, for a new product like chilled fresh meat, without product information, it would be difficult for consumers to distinguish it from other meats. Therefore, this research focuses on the impact of product information via label and traceability system on purchase intention toward chilled fresh meat.

1.5. Significance of the research

In the context of serious food scandals today, a new product with many benefits like chilled fresh meat is introduced and being sold in the market is a good thing for consumers. However, chilled fresh meat is still relatively novel to Vietnamese consumers, how to help consumers understand about the product and believe in it, consequently, buy it, is not an easy question for not only producers and retailers but also
government agencies. Because most of Vietnamese consumers have a habit to go to their familiar sellers at the traditional market to buy meat and rely on the verbal information the sellers said without any verification tools. Prepackaging and labelling meat products is also not common in Vietnam. For products which are prepacked and labelled to sell in the supermarkets, the information provided on label is still limited such as price, production date, expiration date, name of producers. Tracing the origin of meat products is also a new concept to Vietnamese consumers. Therefore, it is critical to investigate whether providing product information on label and traceability system can influence on customer trust, attitude, and purchase intention towards chilled fresh meat. The findings will suggest for not only producers and retailers to build strategy to communicate effectively to consumers but also government agencies to control and enhance the development of safety and quality food in Vietnam.

1.6. Research structure

The rest of the research is structured as follows. The theoretical background of product information on labels, traceability systems, hypothesis development, and the conceptual model are described in the next part. The research methodology is then presented, followed by the final model's results. The study concludes with a discussion of the results, management implications, and future research directions.
CHAPTER 2. LITERATURE REVIEW

2.1. Literature review

2.1.1. Revealed information via label

In the world, labelling meat products before selling to consumers is popular, regulations on label are also different from countries to countries. For European consumers, the most essential information was related to the meat's expiration date, its origin, and other factors such as nutritional information, cut name, maturity time, information on the meat's quality control, manufacturing method, and traceability (Bernués et al., 2003). In Vietnam, there are regulations on labelling which applied for foodstuffs in general, including quantity, production date, expiration date, components or ingredient proportions, warnings, usage directions, and storage directions. However, unpackaged fresh, raw food, and processed food sold directly to consumers such as normal meat, fishes, are not needed to be labelled (ND43/2017/ND-CP, 2017).

According to Bernués et al. (2003), label can be a significant way of notifying the quality of fresh meat to the consumer. In making a buying decision, being able to access clear and credible information is essential to consumers. They should be notified about related information of food items and the consuming benefits so that they can make informed purchasing decisions based on their desires and budget (Vermeir & Verbeke, 2006). Food labelling emphasizes the necessity of informing people in order for them to make rational purchasing decisions (O’Fallon et al., 2007). Teng and Wang (2015) also claimed that to simulate customer trust and attitudes, it is critical to provide reliable labeling information by showing how organic goods are produced, manufactured, and treated. Several studies have shown that safety and quality attributes on the label can positively influence on perceptions of consumers towards meat products (Bredahl, 2004; Loureiro & Umberger, 2007).
Although there might be the possible impact of information on label on consumer behavior, various safety and quality information provided on labels are frequently ignored or misinterpreted (Grunert, 2005). Similarly, Verbeke et al. (2007) revealed that despite the different forms of information accessible to consumers that might help reduce food safety concerns, many consumers fail to read or analyze the information on label. Labelled information does not always have positive impact on consumers as Lähteenmäki et al. (2002) found that genetically modified labels reduce the liking of food compared to unlabeled situations. In addition, Verbeke (2001) revealed that over time, consumers have been more skeptical of meat quality labeling; information and perception of labels have been shown to differ significantly from the exact labelled product attribute. Since the effect of information on label on consumer behavior is not clear, it is necessary to examine the relationship between revealed information on label and psychological factors that might influence consumers purchase intention, especially in Vietnam where meat products are usually sold directly without packaging and labelling.

2.1.2. Revealed information via traceability system

Traditionally, extra product information is communicated via label. However, The quantity of information that may be supplied on a label is limited owing to the tight space on the label (Verbeke & Ward, 2006). With the innovation in technology, all necessary information on the food manufacturing process, “from the farm to the table” can be provided through food traceability system. It is defined as “an information technology that captures, stores, and transmits adequate information about food, feed, food-producing animals, or substance at all stages in the food supply chain so that the product can be checked for safety and quality control, traced upward, and tracked downward at any time” (Bosona & Gebresenbet, 2013). Opara (2003) believes that
traceability system should include the following 6 main elements: product traceability (physical location of product); process traceability (any kind of activities, and the sequence of the actions applied on the product); genetic traceability; diseases and pest traceability; input traceability; measurement traceability. By retrieving information from this system, consumers are able to confirm how product is produced, delivered, and preserved (Choe et al., 2009). Many countries in the world have regulated traceability system as a mandatory tool to assure quality and safety of food products in general as well as meat such as European countries, United State, Canada, Japan. However, in Vietnam, traceability system is not mandatory for foodstuffs. Currently, traceability system in food and meat products is still in the trial implementation stage, there are some projects in Ho Chi Minh City with the participants are big food producer companies.

In previous research, researchers have studied on traceability system from some aspects such as food traceability is an important aspect of logistics management in the food and agriculture supply chain (Bosona & Gebresenbet, 2013), the relation between traceability and quality and safety (Van Rijswijk & Frewer, 2008), consumer acceptance model for food traceability systems (Tsai et al., 2014), traceability system can be seen as a mitigator to reduce perceive information asymmetry between consumers and sellers (Kim et al., 2016). Consumer trust can be increased if information on food items can be traced back to their origins through the supply chain (Verbeke, 2001). Few studies, however, have tried to investigate the effects of traceability systems on consumer’s behaviors in terms of behavioral attitude, and purchase intention. Furthermore, most of research have focused on consumers in developed countries such as Europe and other Western countries; there are few studies that have focused on consumers in developing countries in Asia such as Vietnam where traceability systems are in the early phase of implementing, and relatively new to Vietnamese consumers. Therefore, it is important
to measure consumers’ reaction to this system in making purchase decision. Moreover, in most of previous research, to the best of my knowledge, labelling information and traceability systems were studied independently. However, when product information is provided by not only label but also traceability systems, both factors might have stronger impact on consumer behavior. Therefore, it would be necessary to examine the effects of product information on both label and traceability system on consumer purchase intention of chilled fresh meat.

2.2. Research model and hypothesis development

2.2.1. Product diagnosticity

The term "product diagnosticity" refers to the degree to which consumers believe information on label and traceability system is beneficial or useful in accurately evaluating the quality of fresh meat (Choe et al., 2009). When buyers lack the information they need to evaluate a product, making a purchasing choice becomes more difficult (Kempf & Smith, 1998). Increased consumer perception of product diagnosticity, according to Buaprommee and Polyorat (2016), is an essential cognitive component influencing customers' purchase behavior since it allows them to understand the product better and make rational buying decisions. Aboulnasr (2006) also revealed that product diagnosticity has positive impact on product evaluation. In general, the objective of boosting product diagnosticity is to make the purchase process easier for customers (Choe et al., 2009).

In the food sector, numerous features, such as health and quality aspects, are difficult for consumers to determine without the use of a label or third-party detection (Hobbs, 2004). Consumers believe they have more control over their food purchase selections when product information are properly labeled (Miles et al., 2005). Similarly, Stranieri and Banterle (2009) also revealed that the meat label is often used by customers in
forming their purchase choices. They also can gain a precise and objective understanding of the qualities and performance of traceable foods by using high-quality information (Bei & Jiabao, 2015). Thus, the first hypothesis is below:

H1. Information on label positively influences perceived diagnosticity.

Food traceability system may enable sellers to deliver information about the true quality of their product, allow consumers to assess product quality and safety adequately. Through the traceability system, customers may acquire more specific information on product quality, which not only enhances their capacity to diagnose goods but also minimizes their potential losses (Pavlou et al., 2007). Therefore, consumers can have greater product diagnosticity if they have more information on product qualities (Jiang & Benbasat, 2004). Thus, the next hypothesis is below:

H2. Information on traceability system positively influences perceived diagnosticity.

2.2.2. Trust

A person's willingness to rely on someone or something is referred to as trust. In this study, trust refers to a consumer's willingness to put his or her belief in food products produced by trustworthy food manufacturers (Morgan & Hunt, 1994). When consumers believe food products are safe to eat, they develop their trust in product in term of food safety (Chen, 2008). In the meat sector, product trust can be referred to the fact that chilled fresh meat is produced, processed, packed, stored, sold, and consumed according to national standards, with no harmful or dangerous chemicals that may hurt or threaten human health, resulting in poor health or even death for customers (Yuan et al., 2020).

Since the top three food safety concerns were food hygiene, food poisoning, and food additives (Liu & Niyongira, 2017), creating consumer trust in food safety becomes more and more significant. Previous studies found that providing sufficient information
is crucial to stimulate market demand, as this information will boost customer trust and attitudes towards foods (Gracia & de Magistris, 2008). When consumers receive helpful and reliable information, they can understand more about the product and evaluate it more exactly. Traceability systems are expected to improve transparency across the food supply chain, allowing for the development and maintenance of customer trust in food and food producers (Van Rijswijk & Frewer, 2008). Besides that information on label can also significantly enhance consumer trust (Teng & Wang, 2015). Therefore, providing sufficient and reliable information on label and traceability system is essential to enhance consumer trust. This leads to the following hypotheses:

H3. Information revealed on label positively influences consumer trust in chilled fresh meat.

H4. Information revealed on traceability system positively influences consumer trust in chilled fresh meat.

Because increased product diagnosticity may lead to customers feeling better knowledgeable about the product (Jiang & Benbasat, 2004), customer trust in that product is likely to improve. Buaprommee and Polyorat (2016) also revealed that there is a positive effect of product diagnosticity on product trust. Thus, the hypothesis is formed as below:

H5. Product diagnosticity positively influences consumer trust in chilled fresh meat.

2.2.3. Attitudes

Attitude implies to the extent to which a person holds a favorable or unfavorable evaluation of a certain behavior (Ajzen, 1991). Furthermore, previous research has shown that consumer trust is a significant predictor of consumer attitudes and future behavior (Gifford & Bernard, 2006). When it comes to the relationship between trust
and the theory of planned behavior, the antecedent of attitudes toward buying behavior has been described as trust (Wu & Chen, 2005). In addition, product diagnosticity offered by a traceability system has a beneficial influence on customer perceptions of value (Yuan et al., 2020), thus, it might generate positive attitude toward the product. Therefore, hypotheses are following:

H6. Product diagnosticity positively influences attitude

H7. Trust positively influences attitude towards chilled fresh meat

2.2.4. Purchase intention

Purchase intention reflects motivations and cognitive planning for engaging in the behavior (Ajzen, 1991). It is stated that the behavior intention of individuals is the immediate determinant of the behavior of such individuals. In this research, product diagnosticity, product trust, and attitude is investigated as the determinants of the intention to purchase chilled fresh meat.

According to Jiang and Benbasat (2004), increased product diagnosticity helps customers feel that they have been better informed and confident about their products, which can positively leads to more informed purchases. In this sense, the following hypothesis is established:

H8. Product diagnosticity positively influences purchase intention

Consumer behavior, such as purchasing intention and/or willingness to pay, is found to be influenced by product trust (Kehagia et al., 2007; Mora & Menozzi, 2008; Van Rijswijk & Frewer, 2008). If consumers trust in food safety of chilled fresh meat, their intention to buy is more likely to be strong (Buaprommee & Polyorat, 2016). According to Teng and Wang (2015), consumer trust has a direct and positive effect on purchase intention toward organic foods. Thus, the hypothesis is formed as below:
H9. Consumer trust positively influences purchase intention

A favorable attitude regarding chilled fresh meat is an good place to stimulate the consumption of chilled fresh meat. Attitudes, according to Theory of Planned behavior, are a central determinant of behavioral intentions. The more positive an individual's attitude about a behavior is, the more likely he or she is to engage in it. In the same way, a strong and important connection between attitudes and purchasing intentions has been revealed in previous research of Gifford and Bernard (2006). As a result, it is possible that buyer attitudes have a significant impact on their decision to buy chilled fresh meat.

The following hypothesis is put out in this study:

H10. Attitudes positively influence chilled fresh meat purchase intention

2.2.5. Willingness to pay a premium price

Price premium is defined as the amount of money that buyers are willing to pay for a product when compared to similar items (Aaker, 1996). According to Ba and Pavlou (2002), the monetary amount over the average price collected by many sellers from a certain matched product is known as a price premium. Agarwal and Rao (1996) posit that the price premium is the best measure for explaining individual product choices. In this research, willingness to pay a premium price is measured to know whether consumers are willing to pay a higher price for chilled fresh meat than normal meat. Because applying label and traceability system will generate higher cost for producers and distributors, it is important for them to be able to receive higher price.

2.2.6. Research model

The research proposes a conceptual model as presented in Figure 2.1 below. The model has 6 constructs: revealed information via label, revealed information via traceability system, product diagnosticity, trust, attitude, and purchase intention. These constructs
and most of the relationships among them are based on the previous research.

Figure 2.1. Proposed conceptual model
CHAPTER 3. RESEARCH METHODOLOGY

3.1. Research design

This study aims to identify and investigate the relationship between revealed information via label, information traceability systems and consumers’ purchase intention of chilled fresh meat in Vietnam. To collect data addressing research questions, this paper employs quantitative method. Due to the limits of time and resources, the survey questionnaire, which is popular and effective as the previous research in the field, was selected to conduct this research.

3.2. Measurements

The survey instrument in this study was multi-item scales adapted from previously validated scales. The structural model has six constructs including label, traceability system, product diagnosticity, trust, attitude, and purchase intention. In specific, reveal information via label variable consists of four items was adapted from Teng and Wang (2015) and Doll and Torkzadeh (1988) to measure whether chilled fresh meat label provides correct, timely and sufficient information. The traceability system variable consists of four items adapted from Choe et al. (2009) and Pavlou and Fygenson (2006). The product diagnosticity variable was evaluated with three items from Choe et al. (2009). Trust variable consists of three items which was developed based on the measures from Hoque and Alam (2018) to assess respondents trust in chilled fresh meat product. Attitude variable was adapted with four items from the measures developed by Wang et al. (2020) and Madden et al. (1992) to evaluate respondent attitude towards chilled fresh meat. Purchase intention variable was adapted from Choe et al. (2009) and Madden et al. (1992) with two items to measure respondent willingness to buy chilled fresh meat. The final variable is willingness to pay a premium price, which was adapted from Zhang et al. (2020). In addition, respondents are asked the question "How much
more are you willing to pay for chilled fresh meat?" to identify their willingness to pay a premium price for chilled fresh meat, and answer by choosing an extra percentage to the price of normal meat rather than actual monetary amounts. In total, 20 items were measured to assess the proposed model. Table 3.1 below summarizes the measurement items for each construct of the model.

Table 3.1. Measurement items for the structural model

<table>
<thead>
<tr>
<th>Construct</th>
<th>Code</th>
<th>Measurement Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revealed Information via label</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB1</td>
<td></td>
<td>Label provides correct information on chilled fresh meat</td>
</tr>
<tr>
<td>LB2</td>
<td></td>
<td>Label provides timely information on chilled fresh meat</td>
</tr>
<tr>
<td>LB3</td>
<td></td>
<td>Label labelling provides sufficient information chilled fresh meat</td>
</tr>
<tr>
<td>LB4</td>
<td></td>
<td>I am satisfied with the information that label provides</td>
</tr>
<tr>
<td>Revealed Information via Traceability System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TS1</td>
<td></td>
<td>The traceability system provides objective information on chilled fresh meat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>products sufficiently</td>
</tr>
<tr>
<td>TS2</td>
<td></td>
<td>Information provided by traceability system is trustworthy</td>
</tr>
<tr>
<td>TS3</td>
<td></td>
<td>I expect the traceability system to provide accurate information truthfully</td>
</tr>
<tr>
<td>Product Diagnosticity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PD1</td>
<td></td>
<td>Label and traceability system to help me carefully evaluate chilled fresh meat</td>
</tr>
<tr>
<td>PD2</td>
<td></td>
<td>Being able to carefully evaluate chilled fresh meat would make it much easier for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>me to purchase chilled fresh meat</td>
</tr>
<tr>
<td>PD3</td>
<td></td>
<td>Label and traceability system to help me get the real feel for chilled fresh meat</td>
</tr>
<tr>
<td>Trust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td></td>
<td>I trust that chilled fresh meat on the market is free from chemical preservatives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(e.g., formalin)</td>
</tr>
<tr>
<td>T2</td>
<td></td>
<td>I trust that chilled fresh meat sold in the market is free from additive substances</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(e.g., water, colors)</td>
</tr>
<tr>
<td>T3</td>
<td></td>
<td>I trust that chilled fresh meat that I purchase is processed in toxic free</td>
</tr>
<tr>
<td></td>
<td></td>
<td>environment (e.g., bacteria)</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATT1</td>
<td></td>
<td>Consumption of chilled fresh meat is beneficial for me and my family's health</td>
</tr>
<tr>
<td>ATT2</td>
<td></td>
<td>Purchasing chilled fresh meat is beneficial for the sustainable development of the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>agricultural industry</td>
</tr>
<tr>
<td>ATT3</td>
<td></td>
<td>Purchasing chilled fresh meat is a wise decision</td>
</tr>
<tr>
<td>ATT4</td>
<td></td>
<td>I support purchasing chilled fresh meat</td>
</tr>
<tr>
<td>Purchase intention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI1</td>
<td></td>
<td>I plan to purchase chilled fresh meat next month</td>
</tr>
<tr>
<td>PI2</td>
<td></td>
<td>I intend to increase the size of purchases for chilled fresh meat</td>
</tr>
<tr>
<td>Willingness to pay a premium price</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WTP</td>
<td></td>
<td>How much more are you willing to pay for chilled fresh meat than normal meat,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>assume that price of normal meat is VND100,000/kg?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ Less than 5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ 5% - 9.9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ 10% - 14.9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ 15% - 19.9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ 20% or higher</td>
</tr>
</tbody>
</table>

All items were measured with a five-point Likert scale. Participants are required to indicate the extend degree with the statement, in which, 1: Strongly Disagree, 2:
Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree.

3.3. Questionnaire and Pilot testing

Measurement instruments are collected from previous research in English, then used for questionnaire conducting on theoretical framework. To prevent potential issues, a pilot test was conducted online in English and Vietnamese version with 12 Vietnamese respondents to check the coherence and meaning of research items. Based on the result of pilot testing, the questionnaire was adjusted to reduce the misunderstanding issues, and be more suitable in Vietnam context.

There were two parts of the survey questionnaire. The first section includes the demographic information and fresh meat purchase behavior of consumers such as gender, age, education, income, living place, frequency of buying fresh meat, purchasing place, and frequency of consuming meat. The second section consists of questions related to revealed information via label and traceability system influencing on consumers’ purchase intentions. All observed items are ranged randomly in the survey to prevent bias for respondents.

The survey questionnaire items are provided in Appendix.

3.4. Data collection

This research uses two sources of data, including primary and secondary data.

3.4.1. Secondary data

Secondary data is gathered mainly from academic, science papers, journals, and articles. Some information comes from websites and textbooks. To find suitable and reliable secondary data, author try to find related data in terms of “meat”, “fresh meat”, “chilled fresh meat”, “label information”, “traceability system”, “meat purchase intention”, etc.
3.4.2. Primary data

- Sampling design

According to Hair Jr et al. (2016), the reasonable sample size should be at least five times higher than number of question items in the research model, and sample size of 100 is acceptable for structural equation modelling for practical purpose. Thus, this study with 20 items from the research model needs to collect at least 100 respondents.

Since chilled fresh meat are quite new products in Vietnam, they are mostly available at modern trade channels such as supermarkets, modern groceries in major metropolitan area, such as Hanoi, Haiphong, Ho Chi Minh City, Danang, etc. This research focused on grocery shoppers who were between the ages of 18 and 65 in urban areas as research sample. In addition, participants were asked whether they had ever heard of chilled fresh meat as a screening question to ensure they were eligible to answer the survey questions.

- Data collection:

After pilot testing, questionnaires had been distributed widely via social network and in person at some schools and grocery stores, to focus on the target respondents of the study from the early of April 2021 and close on April 25, 2021.

3.5. Data analysis approach

Structural equation modeling is a strong statistical tool for analyzing theoretical models because it can evaluate both measurement models and causal relations at the same time when there are many items in a construct (Chen et al., 2012). Therefore, this study utilized Smart PLS to assess both a measurement model and a structural model. Results and findings will be presented and interpreted in next chapter.
3.5.1. Demographic analysis

The sample demographic such as gender, age, education, income, living place, frequency of buying fresh meat, purchasing place, and frequency of consuming meat will be summarized in percentage tables and charts. The results are shown in Chapter 4.

3.5.2. Measurement model test

The common measurement model assessment procedure is followed to check reliability, and validity of the multiple item measures. This test specifies relationships between the latent constructs and their corresponding indicators.

Measurement model first uses for assessing unidirectional relationship of items measuring a single construct of the study. At this stage, researcher must examine both reliability and validity of the construct (Hair Jr et al., 2016). Reliability of a measure refers to internal consistency of constructs’ items. One way to assess construct reliability is Cronbach’s alpha. The value of Cronbach’s alpha is greater than 0.7 indicating a measure’s reliability (De Vaus, 2002). Alternatively, the internal consistency is evaluated by composite reliability in Smart PLS (Hair Jr et al., 2016). A measure is reliability when the composite reliability is greater than 0.7 (Bagozzi et al., 1998; Hair Jr et al., 2016) An item can be retained in the model if its outer loadings are greater than 0.7 (Hulland, 1999).

Regarding measure validity, Fornell and Larcker (1981) suggest that an average variance exacted (AVE) is greater than 0.5 indicates convergent validity of a constructs while discriminant validity is confirmed when the AVE square root of each construct is greater than its highest correlation with any other constructs in the model.

3.5.3. Structural model test

The first step is to examines the multi-collinearity issues by checking variance inflation
factor (VIF). If VIF value is less than 5.0 indicates that multi-collinearity is not presented in this research.

The second stage is to evaluate expected causal relationships among the latent constructs (structural model). At this stage, the determination coefficient ($R^2$) is the main criteria for assessing impacts of exogenous latent variables on endogenous ones. T-statistics are generated and used for assessing the significant level of the measurement model and structural model. A greater 1.65 of T-statistics indicates a statistical significance of hypotheses tested for significance level of 5%, one tail test (Hair Jr et al., 2016).
CHAPTER 4. DATA PRESENTATION AND FINDINGS

4.1. Demographic analysis

In total, there are 118 questionnaires were collected both online and offline. However, there are 14 responses that were invalid due to giving same answer for all question items. Finally, 104 valid questionnaires were achieved, generating a valid response rate of 88.1 percent.

Table 4.1 Gender distribution

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>27</td>
<td>26.0</td>
<td>26.0</td>
<td>26.0</td>
</tr>
<tr>
<td>Female</td>
<td>77</td>
<td>74.0</td>
<td>74.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>104</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

From Table 4.1 above, 104 respondents who answered the questionnaires are not distributed equally in terms of gender. The number of females is bigger than the number of males. There are 77 females, and 27 males sent their feedback which correspond to 74.0% and 26%, respectively.

Figure 4.1. Age distribution
In Figure 4.1, among 104 respondents, the main participants are 18 to 29 years old. They account for 41 people or 39.4%. The second largest group is people from 30 to 39 years old, with 35 people which present 33.7% of total. The next group is people from 40 to 49 years old, accounts for 20 persons or 19.2%. The group of 50 to 59 years old is the smallest group, only accounts for 7.7% of total with 8 persons. Most of participants are young people in working age from 18 to 39 years old.

![Figure 4.2. Education level distribution](image)

As Figure 4.2 shows, the largest number of respondents belongs to College, University level, accounts for 66.3% with 69 people. Respondents who have master’s degree or higher stand for a smaller number with 22 people or 21.2%. The group of people who have High school level accounts for only 10 people. The ratio number is only 9.6%. The smallest amount belongs to Middle school or lower level, with 3 persons, account for 2.9% of total.
As seen in Figure 4.3, most of respondents are living in urban areas, they account for 92.3% of total or 96 people. Number of respondents who are living in rural area only accounts for 7.7% or 8 people.

In Figure 4.4, the number of respondents who have average monthly income from VND 10 million to VND 19.9 million accounts for 43.2% or 45 people, becomes the largest group. The second group belongs to people who have average monthly income less than VND 10 million with 36 people or 34.6%. Number of respondents who have average monthly income from VND 20 million to VND 29.9 million accounts for 15.4% or 16 people. The smallest group is people who have average monthly income from VND 30 million or above, with only 7 people. In 2020, the average monthly income per capita in
Vietnam was approximately VND 4.19 million, indicating that the majority of respondents have a medium to high monthly income (Statista, 2021).

![Diagram showing respondents' frequency of consuming meat]

**Figure 4.5. Respondents’ frequency of consuming meat**

As Figure 4.5 shows, the group of respondents who often eat meat daily or almost every day, is the largest group, and accounts for 33.65% or 35 people. The second group is the group of people who consume meat from 2 to 3 times a week, accounts for 30.7% or 32 people. It shows that meat is a popular and necessary food for most of respondents in their daily lives.

![Diagram showing respondents’ frequency of buying fresh meat]

**Figure 4.6. Respondents’ frequency of buying fresh meat**

As shown in Figure 4.6, number of respondents who often buy fresh meat from 2 to 3 times a week, accounts for 38 people.
times a week is 38 persons, accounts for 36.5%. The second group is people who buy fresh meat several times a month with 27 people. However, number of people who buy fresh meat once a month and number of people who buy daily or almost daily is small, only 9 people and 7 people, respectively. From Figure 4.5 and 4.6, the frequency of purchasing meat is lower than frequency of eating meat. People often consumes meat daily or almost daily, however, buy fresh meat 2 or 3 times a week.

![Chart showing frequency of meat purchase](image)

**Figure 4.7. Place to buy fresh meat**

Figure 4.7 shows that supermarket is the place that respondents go to buy fresh meat most, with 57 votes. Although traditional market is considered the most popular place for purchasing meat in Vietnam, it receives 53 votes, lower than supermarket. Moreover, retail grocery shop has higher number of votes than local butcher shop, particularly, 33 votes for retail grocery shop and 18 votes for local butcher shop. From these figures, we can see that the purchasing trend in the meat market is changing, from traditional places such as wet markets and local butcher shops to modern channels like supermarkets and retail grocery shops.

### 4.2. Measurement model test

The measurement model enables researchers to evaluate reliabilities of measures based
on the item loadings, the composite reliability, the average variance extracted and discriminate validity of constructs.

4.2.1. Descriptive analysis

Table 4.2. Descriptive analysis

<table>
<thead>
<tr>
<th>Description</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LB1</td>
<td>104</td>
<td>1</td>
<td>5</td>
<td>3.88</td>
<td>0.612</td>
</tr>
<tr>
<td>LB2</td>
<td>104</td>
<td>1</td>
<td>5</td>
<td>3.46</td>
<td>0.736</td>
</tr>
<tr>
<td>LB3</td>
<td>104</td>
<td>1</td>
<td>5</td>
<td>3.40</td>
<td>0.782</td>
</tr>
<tr>
<td>LB4</td>
<td>104</td>
<td>1</td>
<td>5</td>
<td>3.77</td>
<td>0.700</td>
</tr>
<tr>
<td>TS1</td>
<td>104</td>
<td>2</td>
<td>5</td>
<td>3.91</td>
<td>0.559</td>
</tr>
<tr>
<td>TS2</td>
<td>104</td>
<td>2</td>
<td>5</td>
<td>3.80</td>
<td>0.613</td>
</tr>
<tr>
<td>TS3</td>
<td>104</td>
<td>1</td>
<td>5</td>
<td>3.74</td>
<td>0.668</td>
</tr>
<tr>
<td>PD1</td>
<td>104</td>
<td>1</td>
<td>5</td>
<td>3.87</td>
<td>0.639</td>
</tr>
<tr>
<td>PD2</td>
<td>104</td>
<td>1</td>
<td>5</td>
<td>3.88</td>
<td>0.701</td>
</tr>
<tr>
<td>PD3</td>
<td>104</td>
<td>1</td>
<td>5</td>
<td>3.62</td>
<td>0.715</td>
</tr>
<tr>
<td>T1</td>
<td>104</td>
<td>1</td>
<td>5</td>
<td>3.58</td>
<td>0.746</td>
</tr>
<tr>
<td>T2</td>
<td>104</td>
<td>1</td>
<td>5</td>
<td>3.50</td>
<td>0.711</td>
</tr>
<tr>
<td>T3</td>
<td>104</td>
<td>2</td>
<td>5</td>
<td>3.61</td>
<td>0.630</td>
</tr>
<tr>
<td>AT1</td>
<td>104</td>
<td>2</td>
<td>5</td>
<td>3.54</td>
<td>0.637</td>
</tr>
<tr>
<td>AT2</td>
<td>104</td>
<td>2</td>
<td>4</td>
<td>3.27</td>
<td>0.595</td>
</tr>
<tr>
<td>AT3</td>
<td>104</td>
<td>1</td>
<td>5</td>
<td>3.30</td>
<td>0.667</td>
</tr>
<tr>
<td>AT4</td>
<td>104</td>
<td>2</td>
<td>5</td>
<td>3.57</td>
<td>0.619</td>
</tr>
<tr>
<td>PI1</td>
<td>104</td>
<td>2</td>
<td>5</td>
<td>3.75</td>
<td>0.693</td>
</tr>
<tr>
<td>PI2</td>
<td>104</td>
<td>1</td>
<td>5</td>
<td>3.35</td>
<td>0.760</td>
</tr>
<tr>
<td>WTP</td>
<td>104</td>
<td>1</td>
<td>5</td>
<td>3.50</td>
<td>0.788</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>104</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A summary of the descriptive statistics of all measurement items is presented in table 4.2. For each item, the minimum, maximum, mean, and standard deviation are taken into consideration.
4.2.2. Assessing reliability of the constructs

Table 4.3 Item loading and composite reliability of the constructs – 1st test

<table>
<thead>
<tr>
<th>Items</th>
<th>Outer loading</th>
<th>Composite Reliability</th>
<th>Cronbach's Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>LB1</td>
<td>0.858</td>
<td>0.858</td>
<td>0.788</td>
</tr>
<tr>
<td>LB2</td>
<td>0.723</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB3</td>
<td>0.706</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB4</td>
<td>0.809</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TS1</td>
<td>0.774</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TS2</td>
<td>0.807</td>
<td>0.861</td>
<td>0.757</td>
</tr>
<tr>
<td>TS3</td>
<td>0.878</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PD1</td>
<td>0.855</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PD2</td>
<td>0.825</td>
<td>0.879</td>
<td>0.793</td>
</tr>
<tr>
<td>PD3</td>
<td>0.842</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>0.768</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>0.874</td>
<td>0.864</td>
<td>0.763</td>
</tr>
<tr>
<td>T3</td>
<td>0.827</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT1</td>
<td>0.806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT2</td>
<td>0.210</td>
<td>0.814</td>
<td>0.688</td>
</tr>
<tr>
<td>AT3</td>
<td>0.900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT4</td>
<td>0.859</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI1</td>
<td>0.892</td>
<td>0.874</td>
<td>0.712</td>
</tr>
<tr>
<td>PI2</td>
<td>0.870</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 4.3, outer loading of most items measuring the constructs of the study were greater than 0.7, except for ATT2. It shows that outer loading of ATT2 is 0.210, much smaller than 0.4. This claims that ATT2 should be removed from the construct. The test is rerun again, and the result is presented below.
Table 4.4. Item loading and composite reliability of the constructs – 2nd test

<table>
<thead>
<tr>
<th>Items</th>
<th>Outer loading</th>
<th>Composite Reliability</th>
<th>Cronbach's Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>LB1</td>
<td>0.858</td>
<td></td>
<td>0.858</td>
</tr>
<tr>
<td>LB2</td>
<td>0.723</td>
<td></td>
<td>0.858</td>
</tr>
<tr>
<td>LB3</td>
<td>0.706</td>
<td></td>
<td>0.788</td>
</tr>
<tr>
<td>LB4</td>
<td>0.809</td>
<td></td>
<td>0.858</td>
</tr>
<tr>
<td>TS1</td>
<td>0.774</td>
<td></td>
<td>0.861</td>
</tr>
<tr>
<td>TS2</td>
<td>0.807</td>
<td></td>
<td>0.757</td>
</tr>
<tr>
<td>TS3</td>
<td>0.878</td>
<td></td>
<td>0.861</td>
</tr>
<tr>
<td>PD1</td>
<td>0.855</td>
<td></td>
<td>0.879</td>
</tr>
<tr>
<td>PD2</td>
<td>0.825</td>
<td></td>
<td>0.793</td>
</tr>
<tr>
<td>PD3</td>
<td>0.842</td>
<td></td>
<td>0.879</td>
</tr>
<tr>
<td>T1</td>
<td>0.769</td>
<td></td>
<td>0.864</td>
</tr>
<tr>
<td>T2</td>
<td>0.874</td>
<td></td>
<td>0.763</td>
</tr>
<tr>
<td>T3</td>
<td>0.827</td>
<td></td>
<td>0.864</td>
</tr>
<tr>
<td>AT1</td>
<td>0.810</td>
<td></td>
<td>0.894</td>
</tr>
<tr>
<td>AT3</td>
<td>0.903</td>
<td></td>
<td>0.822</td>
</tr>
<tr>
<td>AT4</td>
<td>0.863</td>
<td></td>
<td>0.894</td>
</tr>
<tr>
<td>PI1</td>
<td>0.891</td>
<td></td>
<td>0.874</td>
</tr>
<tr>
<td>PI2</td>
<td>0.870</td>
<td></td>
<td>0.712</td>
</tr>
</tbody>
</table>

After the second testing, Table 4.4 shows that the Cronbach’s alpha of ATT increases to 0.822. All outer loading of all items is greater than 0.7, which indicates significances between the items and the corresponding constructs. Composite reliabilities of all constructs were greater than 0.858 manifests internal consistency of the items to its corresponding constructs. As such, the items were retained in the model as presented in Figure 4.8.
4.2.3. Assessing convergent validity of the constructs

As shown in Table 4.5, the average variance extracted of all measures is greater than 0.5 indicates convergent validity of all constructs: the items measure its corresponding constructs share considerable amount of variances because these items tap into the underlying constructs rather than measurement error (Hair Jr et al., 2016).

Table 4.5. Convergent validity among constructs

<table>
<thead>
<tr>
<th>Construct</th>
<th>AVE (Average Variance Extracted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LB</td>
<td>0.603</td>
</tr>
<tr>
<td>TRACE</td>
<td>0.674</td>
</tr>
<tr>
<td>DIAG</td>
<td>0.707</td>
</tr>
<tr>
<td>TRUST</td>
<td>0.679</td>
</tr>
<tr>
<td>ATT</td>
<td>0.739</td>
</tr>
<tr>
<td>PI</td>
<td>0.776</td>
</tr>
</tbody>
</table>

4.2.4. Assessing discriminant validity of the constructs

The discriminant validity of the constructs is satisfied: diagonal elements (in bold),
square root of average variance extracted of each construct, is greater than its highest correlation with any other constructs (off-diagonal elements) in the model (see Table 4.6). Each construct had a higher correlation with its own measure than with any other construct, showing that the constructs had significant discriminant validity.

Table 4.6. Discriminant validity among constructs

<table>
<thead>
<tr>
<th></th>
<th>ATT</th>
<th>DIAG</th>
<th>LB</th>
<th>PI</th>
<th>TRACE</th>
<th>TRUST</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATT</td>
<td>0.860</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIAG</td>
<td>0.334</td>
<td>0.841</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB</td>
<td>0.262</td>
<td>0.649</td>
<td>0.777</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI</td>
<td>0.652</td>
<td>0.254</td>
<td>0.183</td>
<td>0.881</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRACE</td>
<td>0.291</td>
<td>0.602</td>
<td>0.603</td>
<td>0.225</td>
<td>0.821</td>
<td></td>
</tr>
<tr>
<td>TRUST</td>
<td>0.495</td>
<td>0.541</td>
<td>0.475</td>
<td>0.425</td>
<td>0.519</td>
<td>0.824</td>
</tr>
</tbody>
</table>

4.3. Structural model assessment for hypothesis testing

The structural model (Figure 4.8) enables the formulated hypotheses are tested.

4.3.1. Detecting multicollinearity

Multicollinearity was detected before testing formulates hypotheses. As shown in Table 4.7, variance inflation factor of the exogenous variables of the model are much lower than 5, which indicate a problem of multicollinearity between exogenous variables is not presented in the model (Hair Jr et al., 2016).

Table 4.7. Collinearity statistics (VIF) of exogenous variables

<table>
<thead>
<tr>
<th></th>
<th>ATT</th>
<th>DIAG</th>
<th>LB</th>
<th>PI</th>
<th>TRACE</th>
<th>TRUST</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.335</td>
<td></td>
</tr>
<tr>
<td>DIAG</td>
<td>1.414</td>
<td></td>
<td></td>
<td></td>
<td>1.426</td>
<td>1.966</td>
</tr>
<tr>
<td>LB</td>
<td></td>
<td>1.571</td>
<td></td>
<td></td>
<td>1.969</td>
<td></td>
</tr>
<tr>
<td>PI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.786</td>
</tr>
<tr>
<td>TRACE</td>
<td></td>
<td></td>
<td>1.571</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRUST</td>
<td>1.414</td>
<td></td>
<td></td>
<td></td>
<td>1.676</td>
<td></td>
</tr>
</tbody>
</table>
4.3.2. Hypothesis testing

Table 4.8. Hypothesis testing

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>β</th>
<th>R²</th>
<th>R² adjusted</th>
<th>T Statistics</th>
<th>P Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LB -&gt; DIAG</td>
<td>H1</td>
<td>0.450*</td>
<td>0.491</td>
<td>4.465</td>
<td>0.000</td>
</tr>
<tr>
<td>TRACE -&gt; DIAG</td>
<td>H2</td>
<td>0.331*</td>
<td>0.481</td>
<td>3.289</td>
<td>0.001</td>
</tr>
<tr>
<td>LB -&gt; TRUST</td>
<td>H3</td>
<td>0.117</td>
<td>0.358</td>
<td>1.112</td>
<td>0.133</td>
</tr>
<tr>
<td>TRACE -&gt; TRUST</td>
<td>H4</td>
<td>0.264*</td>
<td>0.339</td>
<td>2.492</td>
<td>0.006</td>
</tr>
<tr>
<td>DIAG -&gt; TRUST</td>
<td>H5</td>
<td>0.306*</td>
<td>0.339</td>
<td>2.549</td>
<td>0.005</td>
</tr>
<tr>
<td>DIAG -&gt; ATT</td>
<td>H6</td>
<td>0.094</td>
<td>0.251</td>
<td>0.825</td>
<td>0.205</td>
</tr>
<tr>
<td>TRUST -&gt; ATT</td>
<td>H7</td>
<td>0.444*</td>
<td>0.236</td>
<td>3.981</td>
<td>0.000</td>
</tr>
<tr>
<td>DIAG -&gt; PI</td>
<td>H8</td>
<td>-0.021</td>
<td>0.440</td>
<td>0.209</td>
<td>0.417</td>
</tr>
<tr>
<td>TRUST -&gt; PI</td>
<td>H9</td>
<td>0.146</td>
<td>0.423</td>
<td>1.450</td>
<td>0.074</td>
</tr>
<tr>
<td>ATT -&gt; PI</td>
<td>H10</td>
<td>0.587*</td>
<td>0.423</td>
<td>7.255</td>
<td>0.000</td>
</tr>
</tbody>
</table>

All hypotheses are one-tail tests; *p<0.05;

As results of data analysis (Table 4.8) show that 6 hypotheses are supported, and 4 hypotheses are not supported. First, concerning the effects of revealed information on label and traceability system on perceived product diagnosticity (H1, H3), the results confirms both hypotheses H1 (β=0.45 and p<0.05) and H3 (β = 0.331 and p<0.05). That is both revealed information on label and traceability system positive impacts on perceived product diagnosticity and the formers can be used to explained 48.1% of the later (R² adjusted = 0.481).

Second, regarding the effects of revealed information on label and traceability system, and product diagnosticity on perceived trust (H2, H4, H5), the finding confirms both hypothesis H4 (β = 0.264 and p<0.05) and hypothesis H5 (β = 0.306 and p<0.05). However, hypothesis H2 is not supported (β = 0.117 and p>0.05). That is, revealed information on traceability system and product diagnosticity positively impacts on trust, however, revealed information via label does not have this impact. Trust can be
explained 33.9% by revealed information on traceability system and product diagnosticity (R² adjusted = 0.339).

Third, about attitude, the results show that hypothesis H6 is not supported (β = 0.094 and p>0.05), thus, product diagnosticity does not have direct impact on attitude. However, hypothesis H7 is confirmed (β = 0.444 and p<0.05), which indicates that only trust significantly and positively impacts on attitude. Trust can also explain for 23.6% attitude variable (R² adjusted = 23.6).

Finally, regarding the effects of product diagnosticity, product trust, and attitude on purchase intention. For the hypothesis H8 and H9, the analysis results do not confirm these hypotheses, particularly H8 (β = -0.021 and p>0.05) and H9 (β = 0.146 and p>0.05), indicates that both product diagnosticity and trust do not directly and positively impact on attitude. In contrast, hypothesis H10 is supported (β = 0.587 and p<0.05) which indicates positive effect of attitude on purchase intention, and attitude can be used to account for 42.3% this behavior (R² adjusted = 0.423).

4.3.3. Effect sizes $f^2$

<table>
<thead>
<tr>
<th></th>
<th>ATT</th>
<th>DIAG</th>
<th>LB</th>
<th>PI</th>
<th>TRACE</th>
<th>TRUST</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.461</td>
<td></td>
</tr>
<tr>
<td>DIAG</td>
<td>0.008</td>
<td></td>
<td></td>
<td>0.001</td>
<td></td>
<td>0.074</td>
</tr>
<tr>
<td>LB</td>
<td></td>
<td>0.253</td>
<td></td>
<td></td>
<td></td>
<td>0.011</td>
</tr>
<tr>
<td>PI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRACE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.061</td>
<td></td>
</tr>
<tr>
<td>TRUST</td>
<td>0.186</td>
<td></td>
<td></td>
<td>0.023</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.9 shows the $f^2$ value for all structural model relationships, in which, values of 0.02, 0.15, 0.35, respectively, indicate small, medium, and large effect of predictor
constructs on target constructs (Cohen, 1988). The results show that ATT has large effect size of 0.461 on PI. DIAG has no effect on ATT (0.008) and PI (0.001) but has small effect on TRUST (0.074). LB has higher effect on DIAG (0.253) than the effect of TRACE on DIAG (0.137). However, LB has no effect on TRUST (0.011), TRACE has small effect on TRUST (0.061). TRUST has medium effect on ATT (0.186) but small effect on PI (0.023).

4.3.4. Mediating effects

There are 4 hypotheses which are not supported; therefore, the author continues to analyze whether there is any mediator in these relationships. The results are shown in Table 4.10 as below:

<table>
<thead>
<tr>
<th>Path</th>
<th>Direct effect</th>
<th>T Statistics</th>
<th>P Values</th>
<th>Path</th>
<th>Indirect effect</th>
<th>T Statistics</th>
<th>P Values</th>
<th>Mediating effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>LB -&gt; TRUST</td>
<td>0.117</td>
<td>1.112</td>
<td>0.133</td>
<td>LB -&gt; DIAG - &gt; TRUST</td>
<td>0.138</td>
<td>2.196</td>
<td>0.014</td>
<td>Indirect-only (Full mediation)</td>
</tr>
<tr>
<td>TS -&gt; TRUST</td>
<td>0.264</td>
<td>2.492</td>
<td>0.006</td>
<td>TS -&gt; DIAG - &gt; TRUST</td>
<td>0.101</td>
<td>1.884</td>
<td>0.030</td>
<td>Complementary (Partial mediation)</td>
</tr>
<tr>
<td>DIAG -&gt; ATT</td>
<td>0.094</td>
<td>0.825</td>
<td>0.205</td>
<td>DIAG-&gt; TRUST-&gt; ATT</td>
<td>0.136</td>
<td>1.983</td>
<td>0.024</td>
<td>Indirect-only (Full mediation)</td>
</tr>
<tr>
<td>DIAG -&gt; PI</td>
<td>-0.021</td>
<td>0.209</td>
<td>0.417</td>
<td>DIAG -&gt; ATT - &gt; PI</td>
<td>0.055</td>
<td>0.844</td>
<td>0.199</td>
<td>No effect (No mediation)</td>
</tr>
<tr>
<td>TRUST -&gt; PI</td>
<td>0.146</td>
<td>1.450</td>
<td>0.074</td>
<td>TRUST -&gt; ATT -&gt; PI</td>
<td>0.261</td>
<td>3.289</td>
<td>0.001</td>
<td>Indirect-only (Full mediation)</td>
</tr>
</tbody>
</table>

First, as seen on the Table 4.10, information on label does not directly influence trust ($\beta = 0.117$ and $p>0.05$), however, it has an indirect impact on trust via product diagnosticity ($\beta = 0.138$ and $p<0.05$). When the specific indirect effect is significant but the direct impact is not, a full mediation (indirect-only effect) is indicated, whereas a partial mediation (direct-only effect) is indicated when the direct effect is significant but the
indirect effect is not (Hair Jr et al., 2016). Thus, in the relationship between information on the label and trust, product diagnosticity acts as a full mediator.

Second, revealed information on traceability system not only directly impacts on product trust ($\beta = 0.264$ and $p<0.05$) but also indirectly via product diagnosticity ($\beta = 0.101$ and $p<0.05$). When both direct effect and indirect effect are positive and significant, complementary mediation is indicated (Hair Jr et al., 2016). Therefore, product diagnosticity plays as a complementary mediator in the relationship between revealed information on traceability system and trust.

Third, product diagnosticity does not directly impact attitude ($\beta = 0.094$ and $p>0.05$), however, it has an indirect impact on attitude via product trust ($\beta = 0.136$ and $p<0.05$). Hence, in this relationship, product trust become a full mediator.

Next, concerning the effect of product diagnosticity on purchase intention, the result shows that product diagnosticity has neither a direct impact ($\beta = -0.021$ and $p>0.05$) nor an indirect impact via attitude ($\beta = 0.055$ and $p>0.05$) on purchase intention. That is no direct effect nor mediation effect in this relationship.

Finally, the result shows that trust does not directly impact on purchase intention ($\beta = 0.146$ and $p>0.05$), however, it has an indirect impact via attitude ($\beta = 0.262$ and $p<0.05$). In this case, attitude serves as a full mediator between trust and purchase intention.
4.3.5. Specific indirect effects

Table 4.11. Specific indirect effects

<table>
<thead>
<tr>
<th>Path</th>
<th>Indirect effect</th>
<th>T Statistics</th>
<th>P Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LB -&gt; DIAG -&gt; PI</td>
<td>-0.010</td>
<td>0.204</td>
<td>0.419</td>
</tr>
<tr>
<td>LB -&gt; DIAG -&gt; TRUST -&gt; PI</td>
<td>0.020</td>
<td>1.180</td>
<td>0.119</td>
</tr>
<tr>
<td>LB -&gt; DIAG -&gt; ATT -&gt; PI</td>
<td>0.025</td>
<td>0.846</td>
<td>0.199</td>
</tr>
<tr>
<td>LB -&gt; TRUST -&gt; PI</td>
<td>0.017</td>
<td>0.770</td>
<td>0.221</td>
</tr>
<tr>
<td>LB -&gt; TRUST -&gt; ATT -&gt; PI</td>
<td>0.030</td>
<td>1.037</td>
<td>0.150</td>
</tr>
<tr>
<td>LB -&gt; DIAG -&gt; TRUST -&gt; ATT -&gt; PI</td>
<td>0.036</td>
<td>1.614</td>
<td>0.054</td>
</tr>
<tr>
<td>TRACE -&gt; DIAG -&gt; PI</td>
<td>-0.007</td>
<td>0.201</td>
<td>0.420</td>
</tr>
<tr>
<td>TRACE -&gt; DIAG -&gt; TRUST -&gt; PI</td>
<td>0.015</td>
<td>1.087</td>
<td>0.139</td>
</tr>
<tr>
<td>TRACE -&gt; DIAG -&gt; ATT -&gt; PI</td>
<td>0.018</td>
<td>0.775</td>
<td>0.219</td>
</tr>
<tr>
<td>TRACE -&gt; TRUST -&gt; PI</td>
<td>0.039</td>
<td>1.207</td>
<td>0.114</td>
</tr>
<tr>
<td>TRACE -&gt; TRUST -&gt; ATT -&gt; PI</td>
<td>0.069</td>
<td>1.846</td>
<td>0.032</td>
</tr>
<tr>
<td>TRACE -&gt; DIAG -&gt; TRUST -&gt; ATT -&gt; PI</td>
<td>0.026</td>
<td>1.427</td>
<td>0.077</td>
</tr>
<tr>
<td>DIAG -&gt; TRUST -&gt; ATT -&gt; PI</td>
<td>0.080</td>
<td>1.816</td>
<td>0.035</td>
</tr>
<tr>
<td>DIAG -&gt; TRUST -&gt; ATT</td>
<td>0.136</td>
<td>1.983</td>
<td>0.024</td>
</tr>
</tbody>
</table>

As Table 4.11 shows, in this structural model, all specific indirect effects of label on purchase intention are not significant (p > 0.05). However, the results shows that the indirect of traceability system through the path TRACE -> TRUST -> ATT -> PI has positive and significant effect on purchase intention (p < 0.05). That is traceability system can influence on purchase intention by generating trust and positive attitude toward chilled fresh meat.

In Table 4.8, product diagnosticity has neither direct impact on purchase intention nor indirect effect through attitude. However, Table 4.11 shows that its indirect effect on purchase intention through path DIAG -> TRUST -> ATT -> PI is positive and significant. Thus, trust and attitude play roles in mediating this relationship.
4.3.6. Willingness to pay a premium price

As shown in Figure 4.9, 57% respondents are willing to pay a higher price for chilled fresh meat supported by label and traceability system. The number of respondents who disagree to pay a higher price for chilled fresh meat is low, only accounts for 10%. Respondents who have neutral opinion account for 33%.

Figure 4.10 shows that among respondents who are willing to pay a higher price for chilled fresh meat, most of them (46%) agree to pay from 5% to 9.9% higher than price of normal meat. The second group accounts for 24%, agrees to pay higher price for
chilled fresh meat but not higher than 5% compared to normal meat’s price. The number of respondents who agree to pay from 10% to 14.9% higher accounts for 13%. For premium price from 15% to 19.9% and 20% or higher, the number of respondents accounts for 12% and 5%, respectively.
CHAPTER 5: DISCUSSION AND CONCLUSION

5.1. Discussion

This research proposes a conceptual model to examine whether product information on labels and traceability system influences consumer intention to purchase chilled fresh meat through product diagnosticity, consumer trust and attitude.

The first question is to investigate whether product information on label and traceability system is helpful for consumers to evaluate the product, the result shows that revealed information on both label and traceability system positively influence product diagnosticity of chilled fresh meat. This finding supports that label and traceability system are useful tools for consumers to understand and evaluate chilled fresh meat. This outcome is consistent with past research findings. Customers' quality perceptions are getting more diverse, and there is a growing desire for food that is labeled with credibility attributes that appear to improve the consumers' perception of quality (Golan et al., 2004). Label information may be seen of as an instrument for improving customer perceptions of meat quality, making it easier for them to select a product according on their preferences (Bredahl, 2004). Food labels play a vital role when a consumer buys a product for the first time (Singla, 2010). On the other hand, by offering consumers with a large volume of information from production stage to point of sales, traceability system also becomes a helpful measure for consumers to understand deeply and evaluate chilled fresh meat accurately. As Grunert (2005) revealed that the provision of transparent product information about foods helps consumers to make their own decisions regarding a product's safety. Moreover, the results also reveal that label has higher impact on product diagnosticity ($\beta = 0.450$, $f^2 = 0.253$) than traceability system has ($\beta = 0.331$, $f^2 = 0.137$). Because consumers can directly read product information on label at the point of sales, however, to access the information on traceability system,
they have to scan QR code by using mobile apps, or checking bar code via website, it might take longer time and inconvenient for consumers. Therefore, label can be perceived to be more useful, more convenient than traceability system in understanding and evaluating the product.

The second question is to investigate whether product information on label and traceability system creates consumer trust in chilled fresh meat, the results show that only information on traceability system is found to have a positively direct impact on product trust. This result is also in line with previous research which found the important role of traceability system in building trust. For examples, when traceability systems are applied, consumers have a better understanding of the entire process from production to sale, and foods are expected to perform better in terms of safety. As a result, it is an effective technique for end users to prevent safety issues (Liu & Niyongira, 2017). A traceability system is a technology that provides consumers with information about food products and thereby impacts consumer trust (Mattevi et al., 2016). Thus, consumer trust in products increases as the traceability system provides more information to them. However, information on label does not directly create product trust, instead, this information can effectively increase consumer knowledge, then create trust in chilled fresh meat. Label of food products alone cannot assure the safety, quality and integrity of food products to encourage consumer confidence (Aung & Chang, 2014). Especially, in Vietnamese context, there are not clear and strict regulations on labelling meat products, the situation that consumers can read information on labels to understand the product, but it does not mean that they believe in product, can be understandable.

The third question is to identify whether product information on label and traceability system can influence on consumers purchase intention. In this research, product information on label can help consumers understand more about chilled fresh meat and
indirectly create their trust in the product, however, the indirect effect of product information on label is found to be not significant on consumer purchase intention. In contrast, product information provided by traceability system has positive and significant effect on purchase intention (TRACE -> TRUST -> ATT -> PI, p value = 0.032 < 0.05). It means that the information on traceability system not only helps consumers increase their knowledge of chilled fresh meat but also considerably influences on their purchase intention by generating trust and positive attitude toward chilled fresh meat. From second and third findings, this research reveals that traceability system is a more effective tool to build consumer trust and positively influence on their purchase intention rather than labels. The findings also suggest that trust and attitude mediate the relationship between information via a traceability system and the intention to buy chilled fresh meat.

The final question is to examine whether consumers are willing to pay a premium price for chilled fresh meat, the results show that 57% of respondents are willing to pay a higher price for chilled fresh meat, with the amount of the price premium to be higher than 5% compared to normal meat. The data also revealed that consumers intent to buy more chilled fresh meat (average of 3.55 on purchase intention). This finding is in line with Choe et al. (2009), who revealed that Korean customers were not only willing to buy more food, but also willing to pay more for food controlled through a traceability system. As a result, both producers and retailers of chilled fresh meat would benefit from the higher sales and price to apply label and traceability system.

In addition, the research also found the importance role of product diagnosticity in mediating the relationship between product information on label and product trust. That is, with revealed information on label and traceability system, consumers may form their understanding and evaluation of chilled fresh meat first, and then create their trust on
product. The positive indirect effect of label on product trust exists only when consumers perceive that information on label is correct, timely, and truthful. The more detailed and accurate information on label is, the more useful that consumers believe in label in evaluating product. When they feel more informed about the chilled fresh meat, they believe more in the quality of product. This is a new finding of the present research as product diagnosticity has not been examined as a mediator between information on label and traceability system and product trust in previous research.

Finally, this research also examined the effect of product diagnosticity on attitude and purchase intention, which has not tested before. The result shows that product diagnosticity does not directly impact on both attitude and purchase intention. However, its effect on attitude is significant through trust, and it also has indirect impact on purchase intention through trust and attitude. This reveals the important role of product diagnosticity in building consumer trust in product which is an antecedent of attitude towards chilled fresh meat. Therefore, this finding contributes more depth into the literature in the field of food marketing on the significance role of product diagnosticity in determining customer purchase intention.

5.2. Practical implication

This research has several implications for building effective strategies to enhance the development of chilled fresh meat in meat market. Firstly, labels and traceability systems have been seen as efficient instruments for assisting customers in obtaining accurate and reliable information in the meat market, particularly for individuals with limited understanding of chilled fresh meat. Given that chilled fresh meat is a new concept compared to normal meat, providing reliable information through a label and traceability system is critical to help consumers understand and evaluate the product in order to make informed purchasing decisions. Hence, for producers and marketers,
labels and traceability system should be used as effective tools to provide product information to consumers. The information on labels and traceability system should be accurate, timely, and detail. Especially, information on label should not provide only basic information such as price, production date, expiration date, but also add more information such as how chilled fresh meat is processed, handled, packaged, and stored. Providing information on label and traceability system not only helps consumers understand the product but also helps producers to differentiate their products with others and enhance their competitive advantage in market. Marketers should also promote the benefits of using labels and traceability from consumers’ side and instruct them to obtain product information through these tools in the easiest way. On the other hand, due to the lack of detail and strict regulations on label and traceability system for food products in Vietnam, some producers can provide incorrect or exaggerated information through these tools to attract customers and compete unfairly with others in the market. Therefore, the government agencies should not only take responsibility to set regulations for chilled fresh meat, but also need to set requirements on label and traceability system for these products. For example, they should standardize the information which must be disclosed via labels and a traceability system to assist consumers in diagnosing products. They should also give a way to verify the information's reliability. For example, the government can provide a variety of procedures for information verification, such as multi-party audits and third-party certification to ensure that the information given by producers is correct and truthful. These activities will protect consumers from frauds or low-quality products, and enhance the consumer trust in product, producers, and government as well as ensure the fair competition among producers in the market.

Second, the result shows that traceability system not only helps consumers to understand
and evaluate chilled fresh meat but also directly create consumer trust in product and positively impact on purchase intention towards the product. Thus, to gain consumer trust in product and impact positively on their purchase intention, producers should implement traceability system for chilled fresh meat. From marketing perspective, traceability system can deliver a lot of product information in each stage from producers to consumers which can fulfill consumer’s needs for credible and reliable information, gain consumer trust, and add more value to consumers. At the same time, traceability system also helps producers strengthen the competitive advantage to other competitors. From manufacturing perspective, traceability system will be an effective tool for producers to control the quality and track every product they sell, take timely prevention and corrective actions if necessary. It also helps producers make or adjust production plan more quickly and accurately to keep up with the change in the market.

In practice, however, to implement a food traceability system with detailed information faces a number of challenges, such as the liability among participating stakeholders like producers, distributors, retailers (Breiner, 2007; Schulz & Tonsor, 2010), technology reliability (Schroeder et al., 2007; Schulz & Tonsor, 2010), the willingness to give information (Golan et al., 2004), and the exchange of information in a standardized format between various links in the chain (Charlebois & Haratifar, 2015). Another major issue is the expense of information dissemination (Golan et al., 2003). Food traceability systems are seen to be costly and complex, which might pose financial issues because a traceability system with more detailed information would lead to higher expenses (Souza Monteiro & Caswell, 2004). For example, digital databases for traceability systems are supposed to be costly to implement, manage, and maintain since they require hardware and software, as well as experienced human resources, training, and certification (Karippacheril et al., 2017).
Because of the diversity of animal sources and the complicated manufacturing chain in Vietnam, implementing a traceability system for meat products is much more difficult, especially for small-scale producers. Small-scale farms at the beginning of the chain frequently do not keep record properly on animal parameters such as feed, health status, age and so on. The involvement of middlemen and traders, who gathered livestock from different farms, further complicated the procedure. Furthermore, retailers buy carcasses from slaughterhouses, then sell pork at traditional markets without specifying where the pig comes from (Le et al., 2017). At the same time, the relationships among the main stakeholders in the chain are not clearly documented, there are few official contracts between the participants; transactions are usually driven by verbal agreements (Le et al., 2017; Nguyen et al., 2017; Unger et al., 2018). To implement traceability system in Vietnam, there should be a corporation from many participants, such as farmers, producers, middlemen, retailers, information technology companies and government agencies. The first suggestion to deal with the diversity of animal sources is to integrate the meat value chain. Farmers can be supplied with feed, piggies, and veterinary services, and enterprises can purchase all finishing animals for slaughter or sale to slaughterhouses. In a vertical integration approach, big companies may exercise complete control over the supply chain, from farmers to consumers. When producers can control a substantial portion of the supply chain, they can ensure product traceability, and quality and safety of the meat. In order for the traceability system to function properly, the government should increase information transparency and properly enhance consumer awareness and trust in the system.

Finally, the study also found that consumers are willing to pay a higher price for chilled fresh meat rather than normal meat. Producers can charge a higher price for products and implement their voluntary traceability system and labels. At the first stage of
implementation of traceability system, producers can design their own internal and external information systems, as well as select how and which product information will be delivered to customers. For example, what information should be provided, by which it should be delivered, e.g., web-based information, mobile apps, etc., to minimize the extra cost of implementation.

5.3. Conclusion, limitations, and future research recommendations

Regarding theoretical aspect, to the best of my knowledge, this research has been the first one which investigated simultaneously the influence of product information via both label and traceability system in consumers’ purchase intention. It has figured out the mechanism that product information can impact on purchase intention through product diagnosticity, product trust, and attitude. First, it was verified that both labels and traceability system are perceived to be useful tools for consumers to understand and evaluate the products. Second, the rational application of the traceability system is of tremendous importance for producers in the context of repeated food safety issues and chaotic management to assure the quality and safety of product, build consumer trust, and generates positive attitude as well as purchase intention. Next, with product information provided via labels and traceability system, consumers feel more informed about chilled fresh meat, evaluate the product to be more reliable and valuable by willing to pay a higher price than normal meat. This research also contributes into the literature in the field of food marketing on the significance role of product diagnosticity in positively mediating the relationship between product information on label and traceability system and product trust which has not been tested in previous research. Moreover, this study is conducted in Vietnam, a developing country, so it can contribute more insights on Vietnamese consumer behavior in comparison with consumers in developed countries. Additionally, the conceptual model in this study can be applied for other products such as organic products, green products, local products, imported
products. These products have some characteristics in common with chilled fresh meat, for example, credence attributes (animal welfare, environment friendly, food safety...), high quality, and able to apply traceability system.

For practical contribution, this study also suggested some practical implications for producers, marketers, government agencies to promote the development of chilled fresh meat in Vietnam, such as providing product information via label and traceability system, implementing traceability system in production and distribution. These implications also can be applied for other products like organic products, green products, local products.

However, there are several limitations in this research. Firstly, this study used only structured questionnaire survey to collect consumers’ evaluation to identify the relationship between information on label and traceability system and their purchase intention. To gain better understanding of consumer’s response and explain this research’s findings more deeply, individual or group interviews should be applied in future research. Secondly, this research just examined the effect of information on label and traceability system on their purchase intention through product diagnosticity, trust, and attitude. Future research should test the effect through other variables such as expected quality, perceived value, perceived risk to find out new mediators or moderators (if any) in the relationship between label and traceability system and purchase intention. It will help gain more insight on the impact of information on label and traceability system on their purchase intention. Finally, other marketing variables like pricing, distribution channel, and promotions might be investigated to provide a better knowledge of customer behavior, since this study concentrated on the influence of labels and traceability systems.
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APPENDIX

SURVEY ON CHILLED FRESH MEAT

Hello everyone!

My name is Nguyen Thi Anh (Ms.), student at Master of Business Administration program, Vietnam Japan University, Hanoi National University. Now I am conducting a survey on chilled fresh meat.

Please give me your idea about this product through the survey below. All information you provide will be held in the strictest confidence; no individual will be identified. All responses will be reported in a summarized format and used for research only.

Thank you for taking time to complete this survey.

Contact information:

Nguyen Thi Anh (Ms.)
Email: 19110088@gmail.com

Do you know about chilled fresh meat products in Vietnam? (e.g. pork meat MeatDeli, chicken meat MeatDeli) =>

☐ Yes
☐ No

If your answer is Yes, please going to the following parts.

DEMOGRAPHIC PROFILE

1. What gender do you identify as?
   ☐ Male
   ☐ Female
   ☐ Other

2. What is your age?
   ☐ 18 – 29 years old
   ☐ 30 – 39 years old
   ☐ 40 – 49 years old
   ☐ 50 – 59 years old
   ☐ 60 years old or older
3. What is the highest degree or level of education you have completed? If currently enrolled, choose the highest degree will be received.

- Middle school or below
- High school
- Colleges, Universities
- Master's Degree or higher

4. Where are you living now?

- Urban
- Rural

5. How much is your average monthly income?

- Less than VND10 million
- VND10 million – VND19.9 million
- VND20 million – VND29.9 million
- VND30 or higher

6. How often do you purchase fresh meat?

- Once a month
- Several times a month
- Once a week
- 2 – 3 times a week
- Daily or almost everyday

7. Please choose 1 or 2 places that you often buy fresh meat most.

- Traditional market
- Local butcher shop
- Supermarket
- Retail grocery shop
- Others

8. How often does your family eat meat?

- Once a month
- Several times a month
- Once a week
- 2 – 3 times a week
- Daily or almost everyday
MAIN PART

For your reference, there are some brief information on 3 types of fresh meat in Vietnam.

- Normal meat
  - Produce, deliver, store at normal temperature
  - Shelf life: within a day

- Chilled fresh meat
  - Produce, deliver, store at 0 ~ 4°C
  - Shelf life: 3 ~ 7 days

- Frozen meat
  - Store at −18°C or below
  - Shelf life: 3 ~ 6 months

Here are examples of information on label and food traceability system.

9. Please indicate to what extend you agree or disagree with each statement below:

In which:

1 = Strongly disagree  
2 = Disagree  
3 = Neutral  
4 = Agree  
5 = Strongly Agree

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label provides correct information on chilled fresh meat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Label provides timely information on chilled fresh meat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Label provides sufficient information chilled fresh meat</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>I am satisfied with the information that label provides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traceability system provides information on chilled fresh meat sufficiently</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Information provided by traceability system is trustworthy 1 2 3 4 5
Traceability system provides accurate information 1 2 3 4 5
Traceability system and label to help me carefully evaluate chilled fresh meat 1 2 3 4 5
Being able to carefully evaluate chilled fresh meat would make it much easier for me to purchase chilled fresh meat 1 2 3 4 5
Traceability system and label to help me get the real feel for chilled fresh meat 1 2 3 4 5
I trust that chilled fresh meat on the market is free from chemical preservatives (e.g., formalin) 1 2 3 4 5
I trust that chilled fresh meat sold in the market is free from additive substances (e.g., water, colors) 1 2 3 4 5
I trust that chilled fresh meat that I purchase is processed in toxic free environment (e.g., bacteria) 1 2 3 4 5
Consumption of chilled fresh meat is beneficial for me and my family's health 1 2 3 4 5
Purchasing chilled fresh meat is beneficial for the sustainable development of the agricultural industry 1 2 3 4 5
Purchasing chilled fresh meat is a wise decision 1 2 3 4 5
I support purchasing chilled fresh meat supported by traceability system and label 1 2 3 4 5
I plan to purchase chilled fresh meat next month 1 2 3 4 5
I intend to increase the purchasing quantity of chilled fresh meat 1 2 3 4 5
I am willing to pay a higher price for chilled fresh meat than normal meat 1 2 3 4 5

10. If you agree to pay a higher price for chilled fresh meat, how much more are you willing to pay for chilled fresh meat than normal meat, assume that price of normal meat is VND100,000/kg?

☐ Less than 5%
☐ 5% - 9.9%
☐ 10% - 14.9%
☐ 15% - 19.9%
☐ 20% or higher

Thank you for completing the survey!
BẢNG KHẢO SÁT VỀ THỊТ MÁT

Xin chào mọi người!

Tôi tên là Nguyễn Thị Ánh, học viên chương trình Thạc sĩ Quản trị kinh doanh, trường Đại học Việt Nhật - Đại học Quốc gia Hà Nội. Hiện nay, tôi đang thực hiện khảo sát về sản phẩm thịt mất tại Việt Nam.

Vui lòng cho biết ý kiến của bạn về sản phẩm này thông qua khảo sát dưới đây. Mọi thông tin bạn cung cấp sẽ được giữ bí mật. Tất cả các câu trả lời đều được xử lý, báo cáo dưới dạng tổng hợp và chỉ phục vụ cho mục đích nghiên cứu.

Tôi xin chân thành cảm ơn sự hỗ trợ nhiệt tình từ bạn!

Thông tin liên hệ:

Ms. Nguyễn Thị Ánh

Email: 19110088@gmail.com

Bạn có biết đến các sản phẩm thịt mất tại Việt Nam không? (VD. Thịt lợn, thịt gà MeatDeli)

☐ Có
☐ Không

Nếu câu trả lời là Có, vui lòng chuyển tới các câu hỏi phía dưới.

PHẦN THÔNG TIN CÁ NHÂN

1. Vui lòng cho biết giới tính của bạn?

☐ Nam
☐ Nữ
☐ Khác

2. Vui lòng cho biết tuổi của bạn?

☐ 18 – 29 tuổi
☐ 30 – 39 tuổi
☐ 40 – 49 tuổi
☐ 50 – 59 tuổi
☐ 60 tuổi hoặc hơn
3. Vui lòng cho biết trình độ học vấn cao nhất bạn đạt được. Nếu bạn đang theo học, bằng cấp bạn sẽ nhận được là gì?
   □ Trung học cơ sở hoặc thấp hơn
   □ Trung học phổ thông
   □ Cao đẳng, Đại học
   □ Thạc sĩ hoặc cao hơn

4. Hiện tại bạn đang sống ở đâu?
   □ Nội thành
   □ Ngoại thành

5. Vui lòng cho biết thu nhập trung bình hàng tháng của bạn?
   □ Dưới 10 triệu đồng
   □ 10 triệu – 19.9 triệu đồng
   □ 20 triệu – 29.9 triệu đồng
   □ 30 triệu hoặc cao hơn

6. Bạn có thường xuyên mua thịt không?
   □ Một lần một tháng
   □ Vài lần một tháng
   □ Một lần một tuần
   □ 2 – 3 lần một tuần
   □ Hàng ngày hoặc gần như hàng ngày

7. Vui lòng chọn 1 hoặc 2 nơi bạn thường xuyên mua thịt nhất?
   □ Chợ truyền thống
   □ Quầy bán thịt gần nhà
   □ Siêu thị
   □ Cửa hàng bách hóa (VD. Vinmart+)
   □ Khác

8. Gia đình bạn có thường xuyên ăn thịt không? (VD. Thịt lợn, thịt bò, thịt gà)
   □ Một lần một tháng
   □ Vài lần một tháng
   □ Một lần một tuần
   □ 2 – 3 lần một tuần
   □ Hàng ngày hoặc gần như hàng ngày
PHÂN DÁNH GIÁ CHÍNH

Dưới đây là thông tin ngắn gọn về 3 loại thịt hiện đang bán tại Việt Nam để bạn hiểu rõ hơn:

**Thịt thường**
- Sản xuất, vận chuyển, bảo quản ở nhiệt độ thường
- Thời hạn sử dụng: trong ngày

**Thịt mát**
- Sản xuất, vận chuyển, bảo quản từ 0 - 4°C
- Thời hạn sử dụng: 3 - 7 ngày

**Thịt đông lạnh**
- Bảo quản tại -18°C hoặc thấp hơn
- Thời hạn sử dụng: 3 - 6 tháng

Minh họa về thông tin trên nhãn sản phẩm (viết tắt là "nhan SP") và hệ thống truy xuất nguồn gốc (viết tắt là "hệ thống TXNG")

9. Bạn vui lòng cho biết mức độ động ý hay không động ý về các mục sau, trong đó:
   1 = Rất không động ý   2 = Khỏng động ý   3 = Bình thường   4 = Động ý   5 = Rất động ý

   Nhãn SP cung cấp thông tin chính xác về thịt mát: 1 2 3 4 5
   Nhãn SP cung cấp thông tin kịp thời: 1 2 3 4 5
   Nhãn SP cung cấp thông tin đầy đủ về thịt mát: 1 2 3 4 5
   Tôi hài lòng với các thông tin được cung cấp trên nhãn SP: 1 2 3 4 5
Hệ thống TXNG cung cấp thông tin về thị trường một cách đầy đủ
Thông tin trên hệ thống TXNG là đáng tin
Hệ thống TXNG cung cấp thông tin chính xác
Nhận SP và hệ thống TXNG sẽ giúp tôi đánh giá kỹ càng về thị trường
Việc có thể đánh giá kỹ về thị trường giúp tôi dễ dàng hơn trong việc mua hàng
Nhận SP và hệ thống TXNG sẽ giúp tôi có cảm nhận thật về thị trường
Tôi tin rằng các sản phẩm thị trường không chứa chất bảo quản (VD. Phóc môn)
Tôi tin rằng các SP thị trường cũng không chứa phụ gia thực phẩm (VD. Nước, màu thực phẩm)
Tôi tin rằng các sản phẩm thị trường được sản xuất, chế biến trong môi trường không độc hại (VD. Ví khuẩn, vi trùng)
Việc sử dụng thị trường có lợi cho sức khỏe của tôi và gia đình
Mua thị trường có lợi cho sự phát triển bền vững của ngành nông nghiệp
Mua thị trường là một quyết định thông minh
Tôi ủng hộ việc mua thị trường
Tôi dự định sẽ mua thị trường trong tháng sau
Tôi dự định sẽ mua nhiều thị trường hơn (số kg)
Tôi sẵn sàng chi trả cho thị trường cao hơn thị trường thường

10. Nếu bạn đồng ý mua thị trưởng với giá cao hơn thị trưởng, bạn sẵn sàng mua giá cao hơn bao nhiêu phần trăm? Giá sự giá thị trưởng là 100.000đ/ kg.

☐ Dưới 5%
☐ 5% - 9.9%
☐ 10% - 14.9%
☐ 15% - 19.9%
☐ 20% hoặc cao hơn

Bảng khảo sát đến đây là kết thúc!
Cảm ơn bạn đã dành thời gian quy bửu để hoàn thành bảng khảo sát này!