**Consumers' Perceptions and Purchasing Decision towards Yogurt**

**- A Case Study in Malang City, East Java Province, Indonesia**

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**A Thesis Submitted in Fulfillment of the Requirements for the Degree of**

**Master of Science in Agricultural and Coastal Resources Development**

**Prince of Songkla University**

**2012**

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                        - A Case Study in Malang City, East Java Province, Indonesia

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**Major Program**   Agricultural and Coastal Resources Development

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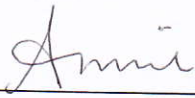
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| **ชื่อวิทยานิพนธ์** | การรับรู้และการตัดสินใจซื้อโยเกิร์ตของผู้บริโภค |
| | - กรณีศึกษาเมืองมาลัง จังหวัดชวาตะวันออก ประเทศอินโดนีเซีย |
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## บทคัดย่อ

ผู้บริโภคในปัจจุบันเชื่อว่าอาหารมีผลโดยตรงต่อสุขภาพ ทำให้โยเกิร์ตซึ่งเป็นผลิตภัณฑ์ที่ได้จากการหมักนมสัตว์ เป็นที่นิยมในท้องตลาด และมีแนวโน้มการบริโภคในประเทศอินโดนีเซียเพิ่มสูงขึ้น ตามกระแสความตระหนักต่ออาหารและความห่วงใยต่อสุขภาพของผู้บริโภค วัตถุประสงค์ของการวิจัยในครั้งนี้ คือ (1) เพื่อศึกษาลักษณะทางเศรษฐกิจสังคมของผู้บริโภคโยเกิร์ต (2) เพื่อจำแนกปัจจัยที่มีผลต่อการรับรู้ของผู้บริโภคต่อโยเกิร์ต (3) เพื่อจำแนกปัจจัยที่มีผลต่อการตัดสินใจซื้อโยเกิร์ตของผู้บริโภค และ (4) เพื่อกำหนดกลยุทธ์ทางการตลาดของโยเกิร์ตในเมืองมาลัง จังหวัดชวาตะวันออก ประเทศอินโดนีเซีย

วิธีการสุ่มตัวอย่างใช้แบบบังเอิญที่มีแบบแผน โดยสุ่มตัวอย่างจำนวน 400 ตัวอย่างจากผู้บริโภคที่มีอายุระหว่าง 15-60 ปี ในเขตเมืองและชานเมือง ข้อมูลปฐมภูมิได้จากการสัมภาษณ์ด้วยแบบสอบถามแบบมีโครงสร้าง ที่ใช้การให้คะแนนแบบลำดับ 1-5 ของลิเคิร์ท ซึ่งข้อคำถามเหล่านี้ได้มีการทดสอบความสอดคล้องและความน่าเชื่อถือ ด้วยวิธีคำนวณค่าสัมประสิทธิ์แอลฟาของครอนบาค การวิเคราะห์ข้อมูลใช้การวิเคราะห์เชิงพรรณนาและการวิเคราะห์การถดถอยโลจิสติกส์เป็นหลัก

ผลการวิจัยพบว่า ลักษณะทางเศรษฐกิจสังคมของผู้บริโภคโยเกิร์ตมีความแตกต่างกันระหว่างเขตเมืองและเขตชานเมืองในบางปัจจัย ผู้บริโภคในเขตเมืองส่วนใหญ่เป็นเพศหญิง สถานภาพโสด มีอายุอยู่ในช่วงระหว่าง 15-20 ปี เป็นนักศึกษา มีรายได้ระหว่าง 1,000,000-1,500,000 รูเปียส์ต่อเดือน และมีการบริโภคโยเกิร์ต 2-3 ครั้งต่อสัปดาห์ ส่วนผู้บริโภคในเขตชานเมืองส่วนใหญ่เป็นเพศหญิง สถานภาพแต่งงาน มีอายุอยู่ในช่วงระหว่าง 25-30 ปี ทำงานในภาคเอกชน มีจำนวนปีในการศึกษาในระบบจำนวน 16 ปี มีรายได้ระหว่าง 1,500,001-2,500,000 รูเปียส์ต่อเดือน และมีการบริโภคโยเกิร์ตเพียงครั้งเดียวในสองสัปดาห์

การทดสอบสมมติฐานด้วยสถิติไคแสควร์พบว่า มีปัจจัยอยู่ 5 ปัจจัยที่มีความสัมพันธ์กับการรับรู้เรื่องโยเกิร์ตของผู้บริโภคในเมืองอย่างมีนัยสำคัญทางสถิติ ปัจจัยเหล่านี้ ได้แก่ อายุ เพศ

ระดับการศึกษา อาชีพ และระดับรายได้ ส่วนปัจจัยที่มีความสัมพันธ์กับการรับรู้เรื่องโยเกิร์ตของ
ผู้บริโภคชานเมืองอย่างมีนัยสำคัญทางสถิติ มีอยู่ 2 ปัจจัย ได้แก่ เพศ และระดับรายได้ สำหรับการ
วิเคราะห์การรับรู้พบว่า คู่ของปัจจัยที่มีความสัมพันธ์กันของผู้บริโภคในเมือง ได้แก่ อายุและการ
รับรู้เกี่ยวกับผลิตภัณฑ์ (เช่น กลิ่นและรสชาติ ฉลากฮาลาล และวิถีชีวิต) ระดับการศึกษาและการ
รับรู้เกี่ยวกับราคา อายุและการรับรู้เกี่ยวกับสถานที่ (หาได้ง่าย และใกล้) อาชีพ ระดับรายได้และการ
รับรู้เกี่ยวกับการส่งเสริมการขาย ส่วนในเขตชายเมืองนั้น มีปัจจัยสำคัญ คือ เพศและการรับรู้
เกี่ยวกับผลิตภัณฑ์ (เช่น กลิ่นและรสชาติ ฉลากฮาลาล และวิถีชีวิต) เพศและระดับรายได้และการ
รับรู้เกี่ยวกับราคา (เมื่อราคาเปลี่ยนแปลง)

ผลจากการวิเคราะห์การถดถอยโลจิสติกส์พบว่า ปัจจัยที่มีผลต่อการตัดสินใจซื้อโยเกิร์ต
ของผู้บริโภคในเมืองมาลัง ได้แก่ อายุ เพศ ระดับการศึกษา อาชีพ ระดับรายได้ และความแตกต่าง
ระหว่างเขตเมืองและชานเมือง

ผลการวิจัยที่ได้สามารถกำหนดกลยุทธ์ทางการตลาดของโยเกิร์ตสำหรับผู้บริโภคในเขต
เมือง คือ การปรับปรุงเกี่ยวกับผลิตภัณฑ์ (เช่น การสร้างมูลค่าเพิ่มให้กับผลิตภัณฑ์) และการมุ่งสู่
ความต้องการที่แท้จริงและเหมาะกับวิถีชีวิตในเมืองของผู้บริโภค โดยเน้นผู้บริโภคที่เป็นผู้หญิง
วัยรุ่น ส่วนผู้บริโภคในเขตชานเมืองควรเน้นสถานที่จำหน่ายและเพิ่มจำนวนร้านจำหน่ายโยเกิร์ต
ให้มากขึ้น การสร้างมูลค่าเพิ่มให้กับผลิตภัณฑ์ด้วยการมีกลิ่นและรสชาติโยเกิร์ตที่หลากหลาย การ
ตั้งราคาโยเกิร์ตให้เหมาะกับระดับรายได้ของผู้บริโภค และการวางแผนส่งเสริมการขายที่ช่วยให้
ผู้บริโภคในเขตขานเมืองมีความรู้เกี่ยวกับโยเกิร์ตเพิ่มมากขึ้น

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**Major Program**      Agricultural and Coastal Resources Development

**Academic Year**      2012

## ABSTRACT

At present, consumers believe that foods contribute directly to their health. Yogurt has become popular dairy-fermented food in the market in recent years. Market trend of yogurt consumption in Indonesia is presently gaining its popularity in line with rising consumer consciousness on diet and health concerns. The aims of this research were (1) to study socio-economic characteristics of consumers towards yogurt, (2) to identify factors influencing consumers' perceptions towards yogurt, (3) to identify factors determining consumers' purchasing decision towards yogurt, and (4) to identify marketing strategies of yogurt in Malang city, East Java province, Indonesia.

Accidental sampling method was used in this study. Four hundred respondents were selected as samples with their age range from 15-60 years in both of urban and sub-urban areas of Malang City. The primary data were obtained through a structured questionnaire survey using Likert interval scale with five response categories (1-5 scale). The ordinary Cronbach's alpha coefficient was utilized to test the internal consistency and reliability for all items under its respective variables. Descriptive analysis and binary logistic regression model analysis were used as data analysis.

The study found that the socio-economic characteristics of sampled consumers in both areas had differences in some factors. The urban consumers were female, single, age ranging between 15-20 years old (teenagers), students, have income level ranging between Rp. 1,000,000-1,500,000 per month and tend to consume yogurt 2-3 times a week. The characteristics of sub-urban consumers were female, married, age ranging between 25-30 years old, private officers, higher education level around 16

years in formal education, had level of income ranging between Rp. 1,500,001-2,000,000 per month, and consumed yogurt around once in two weeks.

Chi-square test showed that there were five factors significantly relating consumer's perceptions in terms of 4Ps towards yogurt in the urban areas of Malang city, namely age, sex, level of education, occupation and level of income. On the other hand, there were only two variables that showed significant relationships in the sub-urban areas, namely sex and level of income. The important pairs of factors that influenced the consumers' perceptions towards yogurt in the urban areas were product and age (variation of flavors/taste, halal food label and lifestyle), price and level of education, place of product and age (ease of location and the distance), promotion of product with occupation and level of income. The important pairs of factors in the sub-urban areas were product and sex (variation of flavors, halal-food label guarantee, and lifestyle), price and sex and level of income (if prices changes).

Result from the binary logistic regression analysis reveals that factors determining consumer' purchasing decision towards yogurt in Malang City were age, sex, level of education, types of occupation, level of income, and location between the urban and sub-urban areas.

Based on the findings of this research, marketing strategies for the urban areas were to improve yogurt product (i.e., enhancing its value addition) and focus on the urban consumers' needs and lifestyles in terms of female and teenager characteristics. For sub-urban consumers, the marketers should focus on market location and expand/add number of yogurt stores, improve the value addition of product by making variations of flavors, adjusting prices to be coincide with the consumers' level of income, and design promotion strategy to increase these sub-urban consumers' knowledge of yogurt.

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# CHAPTER 1
## Introduction

## 1.1 Research background

In the last decades consumer demand in the field of food production has changed considerably. Consumers more and more believe that food contributes directly to their health (Mollet and Rowland, 2002). Today food is not intended to only satisfy hunger and provide necessary nutrients for human, but also to prevent nutrition-related diseases and improve physical and mental well-beings. In addition, the consumers have concerns for their diet in terms of health, convenience and safety aspects. They generally prefer food that promotes good health, has high quality and prevent diseases (Purnomo, 2010). Therefore, this food must fit into current lifestyles providing conveniences of use, good nutrition, good flavor/taste and an acceptable price. In order to fulfill these needs, the food industries produce healthier food such as functional food which is also known as 'food plus' or 'nutraceuticals' (Lang, 2007). Those are foods containing supplements that are intended to improve human health and they are usually recognized as having physiological benefits beyond those of basic nutrition (Gurakan *et al.,* 2010 cited by Yildiz, 2010), such as dairy fermented food (Purnomo, 2010).

Yogurt has become popular fermented dairy food in the market in recent years (Robinson, 2007). Consumer interest in yogurt has grown enormously during the past ten years in many industrialized countries. The information provided by manufacturers of the beneficial bacteria contained in the yogurt products becomes appealing and attractive to consumers (Hsu and Lin, 2006 cited by Fuller *et al.,* 2004). The most important property that consumers are interested in yogurt is its ability to enhance their health. Yogurt has been identified as one of the functional food that is scientifically recognized as having physiological benefits beyond those of basic nutrition to human health. Many researchers state that yogurt is beneficiaries-fermented dairy food product that contains nutritional benefits beyond those of milk such as live probiotics microorganisms (Miller *et al.*, 2007 and Yidiz, 2010). Functional properties of probiotics have projected probiotics as a new ingredient in functional food market in the current era of self-care and

complementary medicine (Sarkar, 2007). It also has been shown to have a significant potential for improving human health and preventing/treating diseases (Goldin, 1998).

Further, Naut (2004) reported that yogurt is the fermented dairy food produced by culturing one or more of the optional dairy ingredients with a characterizing bacterial culture that contains lactic acid–producing bacteria, namely *Lactobacillus bulgaricus (LB)* and *Streptococcus thermophilus (ST)* which has several benefits to human health.

Indonesia is the fourth largest country in terms of population in the world, after China, India and the USA (BPS, 2008). It has young and increasing population totally around 238 million in 2010 with population growth rate of 1.49 percent per year in the last ten years (BPS, 2010). This huge number of population is a potential market for the development of businesses and marketing of various kinds of products and services. Statistics from GAIN Report (2010) showed that Indonesia's economic growth rate has increased from 6 percent to 6.3 percent from 2009 to 2010. In 2009, Indonesian Central Bureau of Statistics Annually declared that average monthly percentage per capita expenditure of protein consumption by commodity group, particularly for egg and milk consumption had increased every year in 2007, 2008 and 2009 at 2.97, 3.12 and 3.27 percent, respectively. Thus, it can be seen that Indonesia can be a volatile market for milk products and their derivatives.

In terms of milk and fermented dairy products such as yogurt, Global Agriculture Information Network (GAIN, 2010) reported that annual Indonesian per capita milk consumption was 11.9 liters per capita per year in 2010 (increased from 7.7 liters in 2009), but still relatively lower than other comparable ASEAN countries, such as Vietnameses is around 12.1 liters; Malays and Filippinos 22.1 liters; Thai 31.7 liters; and India approximately 42.1 liters (Suherdjoko, 2010 cited by www.thejakartapost.com, 2011; Rahmad, 2010 cited by htt://kesehatan.liputan6. .com/berita, 2011).

Market trend of yogurt consumption in Indonesia is presently gaining its popularity in line with rising consumer consciousness on diet and health concerns (Samabandhu, 2011). Around 20 tons of yogurts per day are produced by yogurt

manufactures in Bogor, East Java in order to fulfill the market demand (Purwadi, 2011). This can be a trigger to expand market of yogurt in Indonesia as well as to promote consumers' perception and decision to purchase dairy products in general.

Rising consumers' income and their consciousness on health have impacts on changing consumption patterns, not only in terms of food patterns and energy intake, but also in terms of attitude, perception and behaviors. In terms of perception, several literatures, i.e., Solomon, 1994, Schiffman and Kanuk, 2007 and Lake, 2009 defines perception as one of the factors affecting consumers' behaviors especially in their process of their purchasing decision on products and services. It is argued that perception is one of the main factors determining consumers purchasing or accepting of products and services. Schiffman and Kanuk (2007) explained that an individual acts and reacts in terms of a consumer's decision to purchase of products or services on the basis of their perceptions, not on the basis of objective reality. Thus, for the marketers, consumers' perceptions are much more important than their knowledge of objective reality.

Undoubtedly, understanding consumers' perception and purchasing decision are critical to successful marketing and enhancing marketing value of a product. By understanding the above issues, basic planning information to marketing planners and the design of appropriate marketing strategies can be formulated. In this study, understanding of consumers' perception towards yogurt can give better information of consumers' reasons behind their decision to purchase yogurt. Malang city is selected as a research area due to its status as the second largest city in East Java Province, Indonesia.

## 1.2    Research objectives

This research has its general objective to study consumers' perceptions and purchasing decision towards yogurt in Malang city, East Java province, Indonesia. Specifically, it has four objectives as follow:

(1)    to study socio-economic characteristics of consumers in view of yogurt consumption,

(2)    to identify factors influencing consumers' perceptions towards yogurt,

(3)    to identify factors determining consumers' purchasing decision towards yogurt, and

(4)    to identify marketing strategies of yogurt in Malang city, East Java province, Indonesia.

## 1.3    Research outcomes

The main research outcomes are synthesized results within the scope of the conceptual and analytical framework. The synthesis of the results is expected to provide:

(1)    Better understandings of consumers' perceptions and purchasing decision towards yogurt,

(2)    Useful knowledge for dairy industry (i.e., marketing managers) to develop marketing plans and strategies for yogurt. It can be useful for dairy firms to target suitable consumers,

(3)    Improved knowledge and information for dairy farmers and dairy cooperatives so that they can utilize it to improve productivity and quality of milk, and

(4)    Improved knowledge for academicians about consumer behaviors towards yogurt for further research or case study in courses related to these topics.

## 1.4    Definition of key terms

(1)    Perception is the process of attaining awareness or understanding the environment by organizing and interpreting sensory information.

(2)    Consumers' perception is the way how the consumers (person or group of people) identify (recognize) and interpret something (i.e., sensory stimuli) that they receive based on their personal factors, knowledge, past experience and other external stimuli.

(3)    An urban area is a city or densely populated area, it is characterized by higher population density and vast human features in comparison to areas surrounding it (such as a city, town, downtown city) which is created and further developed by the process of urbanization. Definition of an urban in

Indonesia is a place with urban characteristics. An urban area is a continuously built up land mass of urban development.

*Malang urban areas* are areas in down town city characterized by higher population density, as a trading center, also center of administration. Malang urban areas include Lowokwaru, Klojen, and Blimbing sub-districts.

(4) Sub-urban refers to a residential area of a city or a separate residential community within commuting distance of a city. It also can be defined as a residential district located on the outskirts of a city. Some sub-urbans have a degree of political autonomy, and most have lower population density than <u>inner city</u> neighborhoods**.**

*Malang sub-urban areas* are areas located in surrounding Malang urban city, including Kedungkandang and Sukun sub-districts.

(5) Purchasing refers to the act of buying something such as products and/or services. The other definition of purchasing is the activity of acquiring goods or services to accomplish the goals of an organization. In this study purchasing is refers to the same meaning with buying.

(6) Buyer is someone or a person who buys or purchases products and/or services.

(7) Wants are something that is desired.

(8) Needs are something that is necessary for organisms to live a healthy life.

## CHAPTER 2
## Literature Review

This chapter provides a review of history and development of yogurt, perception concepts, and consumers' perceptions towards yogurt, ways to measure perception and theories of consumers' purchasing decision process. It additionally presents conceptual and analytical framework developed for this study. In addition, it presents a review of the previous research findings related to the research topic.

### 2.1 Yogurt

Yogurt is not a new term in dairy milk product. There is an evidence of cultured milk products being produced as food for at least 8000 years. The earliest yogurts were probably and spontaneously fermented by wild bacteria living on the goat skin bags carried by nomadic people. Today many different countries claim yogurt as their own invention, yet there is no clear evidence as to where it was first discovered, and it may have been independently discovered several times (Tannahill, 1988 cited by Yildiz, 2010)

In 1908, Elie Metchnikov the Nobel Prize Laureate for his discovery of phagocytic (celleating) cells, proposed in his book *"The Prolongation of Life"* (Metchnikoff, 2004 cited by Yildiz, 2010) that the secret to longevity lied in maintaining healthy colon bacteria. He even named the responsible bacteria, *Lactobacillus bulgaricus* (LB), after the Bulgarians, whose health and longevity he attributed to the large quantities of yogurt they typically ate. While his conclusions were met with skepticism for many years, healthy gut bacteria are now decidedly back as probiotics (Yildiz, 2010).

Over the past several years, the consumption of fermented dairy products, especially yogurt, has greatly increased. The most dramatic increases occurred during the 1980s-1990s, which is certainly in part due to increased knowledge of consumers regarding health benefits of yogurt and other fermented dairy products (Dannon, 2002). Moreover, the addition of fruit and sweeteners to yogurt has made it more widely palatable. However, it is likely that the increasing knowledge regarding the health benefits of fermented foods, especially live-culture

yogurt (probiotic) has driven the recent growths in consumption (Water and Naiyanetr, 2008).

### 2.1.1   Definition of yogurt and process to make yogurt

Yogurt is produced using active cultures of bacteria to ferment cream or milk (Water and Naiyanetr, 2008). According to Nauth (2004), yogurt is the food produced by culturing one or more of the optional dairy ingredients with a characterizing bacterial culture that contains lactic acid–producing bacteria, namely *Lactobacillus bulgaricus (LB)* and *Streptococcus thermophilus (ST)*. These bacteria metabolize some of the milk sugar (lactose) in the milk into lactic acid. This action helps change the consistency of liquid milk into yogurt. The production of fermented milk, or yogurt, requires that the milk is first concentrated by the addition of dairy solids, evaporated, or membrane filtered. The mixture is then heated to destroy undesirable organisms, and cooled. Then, the starter cultures are added (Water and Naiyanetr, 2008). In addition, Water and Naiyanetr (2008) described that yogurt products may also have added ingredients such as sugar, sweeteners, fruits or vegetables, flavoring compounds, sodium chloride, coloring stabilizers, and preservatives.

Similarly, Gurakan and Altay (2010) explained that yogurt made by introducing specific bacteria strains into milk, which is subsequently fermented under controlled temperatures (42–43°C) and environmental conditions (in fermentation), especially in industrial production. Then, the bacteria ingest natural milk sugars and release lactic acid as a waste product. The increased acidity (pH   4-5) causes milk proteins to coagulate into a solid mass (curd) in a process called 'denaturation' while it also prevents the proliferation of potentially pathogenic bacteria (Robinson and Tamime, 1986).

Yogurt can be made from any source of milk of any fat content, but mostly fat-free milk yogurt, skim milk yogurt, and full-fat yogurt is made with cow's milk (Yildiz, 2010). In the United States, *L. bulgaricus* and *S. thermophilus* are required by U.S. Food and Drug Administration (FDA) standards in order for a product to be called *yogurt* (Water and Naiyanetr, 2008). The fermentation process involves the inoculation of pasteurized milk that has been enriched in milk protein with concentrated cultures of bacteria, which is then incubated at 40-44°C for 4-5 h.

During fermentation, lactic acid is produced from lactose by the yogurt bacteria. This fermentation process of milk with *lactic acid bacteria* (LAB) leads to specific organoleptic characteristics (taste and aroma) of the final products (Water and Naiyanetr, 2008). Other variables such as temperature, pH, the presence of oxygen, and the composition of the milk further contribute to the particular features of a specific product (Friend *et al.*, 1983; Nakazawa and Hosono, 1992).

According to Yildiz (2010), mostly yogurt made by the starter or bacterial species *Streptococcus salivarius* subsp. *thermophilus* (ST) and *Lactobacillus delbrueckii* subsp. *bulgaricus (LB),* using a ratio of 1:1, ST to LB. A temperature of 43 ℃ is maintained for 4-6 hours under quiescent (no agitation) conditions. This temperature is a compromise between the optimums for the two microorganisms (ST 39 ℃; LB 45 ℃). The coagulated product is cooled to 5-22 ℃, depending on the product. Afterward, add some tastes such as fruit and flavor (incorporated at that time), then pack the finished yogurt products. The last step is storing of the product at refrigeration temperatures (5 ℃) to slow down the physical, chemical, and microbiological degradation.

### 2.1.2    Benefits of yogurt

A large body of scientific research indicated that the consumption of the recommended level of milk and fermented dairy products, as part of a healthy diet, could contribute and reduce the risk of many diseases (Sandholm and Saarela, 2003). Miller *et al.* (2000) also stated that fermented dairy products are rich in nutrients such as protein of high biological value, high bioavailable minerals such as phosphorus, potassium, zinc, and vitamins. Carla (2008) found that the role of yogurt and other fermented dairy products as functional foods could enhances the immune system and prevent diseases. According to Anderson and Gilliland (1999), fermented dairy products and probiotic bacteria decrease the absorption of cholesterol. It can help to improve the balance of "beneficial" versus "undesirable" bacteria in the intestinal tract and increase the immune system (Yildiz, 2010). Probiotics are nutritional supplements containing potentially beneficial bacteria usually found in gastrointestinal tract and are currently used to produce beneficial health effects in variety of conditions and diseases in people throughout the world (Miller *et al.*, 2007). Some of the beneficial effects of probiotics are to prevent infectious diseases, enhance

humoral immune responses (immunity boost) by increasing *Immunoglobulin A(IgA)* producing cells and stimulating antibody responses to some specific antigents (Khurana and Kanawjia, 2007).

### 2.1.3 Types of yogurt

In general, there are several types of yogurt such as:

(1) Plain yogurt.

There are two types of plain yogurt:

(1.1) Set yogurt

A solid set where the yogurt forms in a consumer container and is not disturbed. In addition, Gürakan and Altay (2008) reported that the set yogurt is packed immediately after inoculation with the starter and is incubated in the packages.

(1.2) Stirred yogurt

Yogurt is first made in a large container and then spooned or otherwise dispensed into secondary serving containers. The consistency of the "set" is broken and the texture is less firm than set yogurt. This is the most popular form of commercial yogurt (Yildiz, 2010).

(2) Drinking (sweet) yogurt

Stirred yogurt to which additional milk and flavors are mixed in. Fruit or fruit syrups are added to taste. Milk is added and mixed to achieve the desired thickness. The shelf life of this product is 4-10 days, since the pH is raised by fresh milk addition. Some where separation will occur and is natural (Chandan *et al.*, 2006). Gürakan and Altay (2008) defines drinking yogurt as stirred yogurt with total solid content not higher than 11 percent and has undergone further homogenization to reduce the viscosity.

(3) Frozen yogurt

After manufacturing yogurt, it is frozen by batch or continuous freezers (Yildiz, 2010). This type of yogurt is more popular and became a trend in the market now (Chandan *et al.*, 2006).

**2.2 Consumers' perception towards yogurt and fermented dairy products**

Nowadays, yogurt and fermented dairy products are one of the most popular functional foods in the world because it provides nutrients and a variety of health attributes associated with probiotic bacteria (McKinley, 2005). They have many benefits/positive effect on human health such as improved lactose intolerance, prevent for colon cancer, and enhance the immunity (Chandan *et al*., 2006). Understanding about consumers' perceptions is important especially for marketers to design appropriate strategies in order to satisfy consumers.

**2.2.1 Definition of perception**

Perception is the process by which organisms or an individual selects, organizes, and interprets sensation or stimuli to produce a meaningful experience and coherent picture of the world (Prinz and Brigement, 1995; Schiffman and Kanuk, 2007). It can be described as "how we see the world around us" (Schiffman and Kanuk, 2000). According to Rookes and Willson (2000), perception is a process which involves the recognition and interpretation of stimuli which register on our senses. It was supported by Solomon (1994) who described perception as the process by which people select, organize, and interpret the sensation - the immediate response of our sensory receptors like eyes, ears, nose, mouth, fingers - to basic stimuli such as light, color, sound, odor and texture. Lake (2009) also indicated that perception is representative of how a consumer processes and interprets information.

In conditioning consumer choice, perception is considered to be more important than reality. It has been argued that the mental images of products, from the basis of the selection process, to interpret information and to guide consumer behavior, as people act upon what they believe to be true (Ateljevic, 1999). However, Kassarjian and Robertson (1968) stated that the perceptual process is a cognitive phenomenon that can be thought of as the process by which the people make sense of the world. Additionally, Berkman and Gilson (1986) have distinguished two groups of factors that influence perception, categorized as either stimulus or personal response factors.

In terms of marketing strategies and consumers' behaviors, understanding consumer's needs and perceptions are critical to successful marketing and enhancing marketing value of a product.

### 2.2.2    Previous studies related to consumers' perceptions

Many researchers have studied about perceptions or consumers' perceptions in various field of study. A previous study conducted by Grunert *et al*. (2000) about consumer quality perceptions and acceptance of dairy products reported that there were four basic quality dimensions for food in general and dairy products in particular, namely hedonic quality (related to sensory pleasure such as smell, taste and appearance), health-related quality, convenience-related quality, and process-related dimensions (Grunert *et al*., 1996). These four quality dimensions can be found to characterize quality perceptions in many different food products (Grunert *et.al.*, 2000). Moreover, perceived quality according to Grunert *et al*. (2000) are perceptions of tastes, texture, handling and wholesomeness. Based on the theory on economics of information, there is another useful quality dimensions such as search, experience, and credence dimensions (Darby and Karni, 1973; Nelson, 1974).

Another previous study conducted by Radam *et al*. (2010) explained that in regard of consumer health consciousness, some product attributes such as quality, appearance, freshness, convenience, and health enhancement were also important, while other product choice criteria (Carrigan and Attala, 2001) such as price, value, brand and quality were used and sometimes more important choice than ethics factor.

Packaging also plays a major role in attracting consumers' attention and largely influences their purchase decisions (Crilly *et al*., 2004 cited by Ares *et al*., 2011). Besides, it has other functions as a source of product recognition and provides consumers with information about brand image and lifestyle (van Dam and van Trijp, 1994). The study carried out by Ares *et al*. (2011) about simulated yogurt label using semiotic analysis in Spanish and Uruguay found that there were four main aspects of a label which could generate associations, and expectations in consumers' mind such as drawings, visual structure, colors and typography.

Regarding consumers' food choice or purchasing decision on products (Johansen *et al*., 2011), there was a complex process influenced by a number of factors related to product either internal or external factors, the consumer itself (i.e., knowledge, perceptions, attitudes, beliefs) and the consumption context (i.e., occasion, cultural environment). In addition, Verbeke (2005) stated the importance of

"knowledge" and socio-demographic on choosing functional foods, while Messina *et al. (*2008) explained that price and lack of information often expressed as barriers to purchase functional foods. According to Grunert *et al.* (2000), the information about product characteristic could affect the consumers' sensory perceptions.

Various motivating factors such as taste, sensory appeal, weight control, ethical concern, habit, convenience, price or familiarity have been shown to influence food selection (Steptoe *et al*., 1995). In terms of consumer food choice and dairy products, mostly taste becomes one of the main factors that influence consumers' decision-making process (Grunert *et al.*, 2000). The result finding from Pohjanheimo and Sandell (2009) showed that consumers who concerned about their health and natural content of yogurt, preferred less sweet yogurt than consumers who were motivated by convenience, familiarity and tasty food. They found yogurt with sweeter taste and smoother texture more preferred. It can be stated that food choice motives influence consumers' preferences of products/services.

## 2.3  How to measure consumers' perceptions

Research had been conducted by Sato (2009) showing that there were several methods in measuring human perceptions, such as *multiple-choice method, ranking method, rating method, conjoint analysis* and the application of *Analytic Hierarchy Process (AHP).*

Traditional method for measuring respondents' perceptions is the *multiple-choice* (MC) question format, which well suited to questionnaire formatting because respondents find the questions easy to answer and they allow researchers to easily identify the main concerns of the respondents (Jerard, 1995). This method divided into two different forms as suggested by Sato (2004), simple multiple-choice (SMC) and modified multiple-choice (MMC).

Further, Sato (2004) explained that in the SMC method respondents must choose one from among the given alternatives and try to identify only the most important alternative for each respondent, thus preventing the respondent from expressing his or her preference concerning a selected alternative over the others. On the other hand, in the MMC method, respondents have the option of indicating their top-two (or more) alternatives, allowed to express their preferred alternatives and give

them a greater degree of freedom in answering questions. Here, MMC can be expected to be an effective way to make up for the lack of information incurred by the SMC (Sato, 2009). Thus, it also has been widely used because of its ease for respondents to answer and its ease in identifying for the researcher the respondents' main concerns (Sato, 2004). Nevertheless, the difference in the degree of importance among the selected alternatives is not clarified, nor is the information concerning non-selected alternatives reflected in the results (Sato, 2004).

A set of categories or range of scores on a variable is called a scale, and the process of assigning scores to objects to yield a measure of a construct is called scaling. When a respondent applies judgment to assign scores to individuals or objects along the scale, a rating method is being used (Judd *et al.*, 1991). Five-point *Likert-interval scale* often used (in questionnaire) to measure human perception or attitude scale which categories from 1 (*low*) to 5 (*high*). The scale consists of an equal number of agreement or disagreement choices on either side of neutral choices (Schiffman and Kanuk, 2007). The principal benefits of the likert scale is that it gives the researcher option of considering the responses to each statement separately or of combining the responses to produce an overall score (Schiffman and Kanuk, 2007).

Another method that has been applied on perception measures is the *ranking method* (Inglehart and Abramson, 1993). This method asks respondents to rank all given alternatives in a question, from the most preferred to the least, thus allowing researchers to identify a respondent's preference order for all alternatives. The weakness of this method is that the more alternatives a questionnaire offers, the more difficult it is for the respondent to answer (Inglehart and Abramson, 1993). Sato (2003) reported that the drawback to this approach was that it did not allow to ties. It means that respondents with definite preferences on the issue could rank all projects without hesitation. In contrast, some respondents might have no definite preference concerning the issue while others might have ties in the priority of projects/issues.

Moreover, there is another method in marketing segmentation, called *conjoint analysis* which used to find out the relative importance attached by respondents to various attributes of a product that are nominal in nature (Nandagopal *et al.*, 2007). Additionally, Hair *et al.* (1998) explained that conjoint analysis is a multivariate technique used specifically to understand how respondents develop

preferences for products or services. Similarly, Kotler (2009) also defined conjoint analysis as a method for deriving the utility values that consumers attached to varying levels of a product's attributes. The basic aim of the usage of conjoint analysis is to determine features the respondents or consumers most prefer. From the definitions given above it is clear that conjoint studies can be applied to study certain attributes of products or services and also various levels within each attribute (North and de Vos, 2002).

Analytic Hierarchy Process (AHP) is a popular tool/method used to analysis decision-making process in various fields such as economic problems, policy evaluation, and urban planning, because of its user-friendly interface for multi-criteria decision-making (Vargas, 1990 cited by Sato, 2009). Besides, the data from a decision maker's judgments were aggregated and the degree of importance of each alternative was quantified in the AHP (Sato, 2009). Additionally, Saaty (1994) also stated that the AHP had the subjective judgment of each decision-maker as input and the quantified weight of each alternative as output. Therefore, it can be used not only to quantify the objective issues easily but also the more subjective issues that do not have theoretical value. In addition, Crawford and William (1985) informed that this procedure identified not only the most important alternative but also the preference for all alternatives for each decision-maker.

## 2.4   Consumers' purchasing decision process

Consumer behavior is the study of the processes that cover a lot of grounds when individuals or group select, purchase, use, or dispose of products, services, ideas, or experiences to satisfy needs and desires (Solomon, 1994). In addition, consumer behavior represents the study of individuals and the activities (focus on how individuals make decisions to spend their available resources such as time, money and effort (Schiffman and Kanuk, 2007) on consumption-related products and services that take place to satisfy their realized needs and wants (Blackwell *et al.*, 2006 and Lake, 2009).

In general, there are many factors influencing or affecting consumers' purchasing decision process on products or services. Figure 2.1 described the stages of consumer purchasing behavior model adapted from Engel *et al.* (1995). What

influence the consumers' purchasing decision process are marketing stimulus introduced by the companies through product, price, place and promotion strategies (4Ps of marketing mix), plus the external environment stimulus that are the economical, political, social and cultural aspects, and yet the consumer characteristics that are cultural, social, personal and psychological factors.

| Marketing Stimulus (4P): (controlled): | Other Stimulus (uncontrolled): | Buyer Characteristics (consumer): | The Purchasing Decision Process (consumer): | The Purchasing Decision |
|---|---|---|---|---|
| Product Price Place Promotion | Political Socio-cultural Economical Technological | Cultural Social Personal Psychological | Identify the problem Search for information Alternative Information Purchase Decision Post purchase behavior | Product Choice Brand Choice Salesman Choice Time of purchase Capital Expenditure |

Figure 2.1 Consumer purchasing behavior model
Source: Adapted from Engel *et al.* (1995)

From Figure 2.1, it can be seen many facets or stimuli both of internal and external origins such as marketing stimulus (namely marketing mix or "4Ps" that can be controlled by a company. This control of 4Ps affects consumers' purchasing decision process. The other uncontrolled external factors are socio-cultural factors, economical and political situation/policy, and technological factors. Besides, internal factors are related with consumer characteristics which are associated with cultural, social, personal and psychological nature. All of these factors contribute to the purchase decision process. According to the consumer purchasing behavior model by Engel *et al.*, (1995), there are five stages in the purchasing decision process. The first stage is (1) identifying the problem, followed by (2) searching for some information about that products or services that are needed/wanted, (3) evaluating the alternatives or by pre-purchase evaluation of alternatives. Afterwards, the consumer or buyer does the action of (4) purchasing decision, followed by the last stage of (5) post-purchasing decision which consumers express a sense of their satisfaction or dissatisfaction.

In addition, Solomon (1994) indicated that one helpful way to characterize the decision making process was to consider the amount of effort (money, time, energy) that goes into the decision each time it must be made. Other theory comes from Schiffman and Kanuk (2007) who showed that the process of

consumer decision making could be viewed as three distinct but interlocking stages: the input, the process and the output. These stages are illustrated in the simplified model of consumer decision making in Figure 2.2
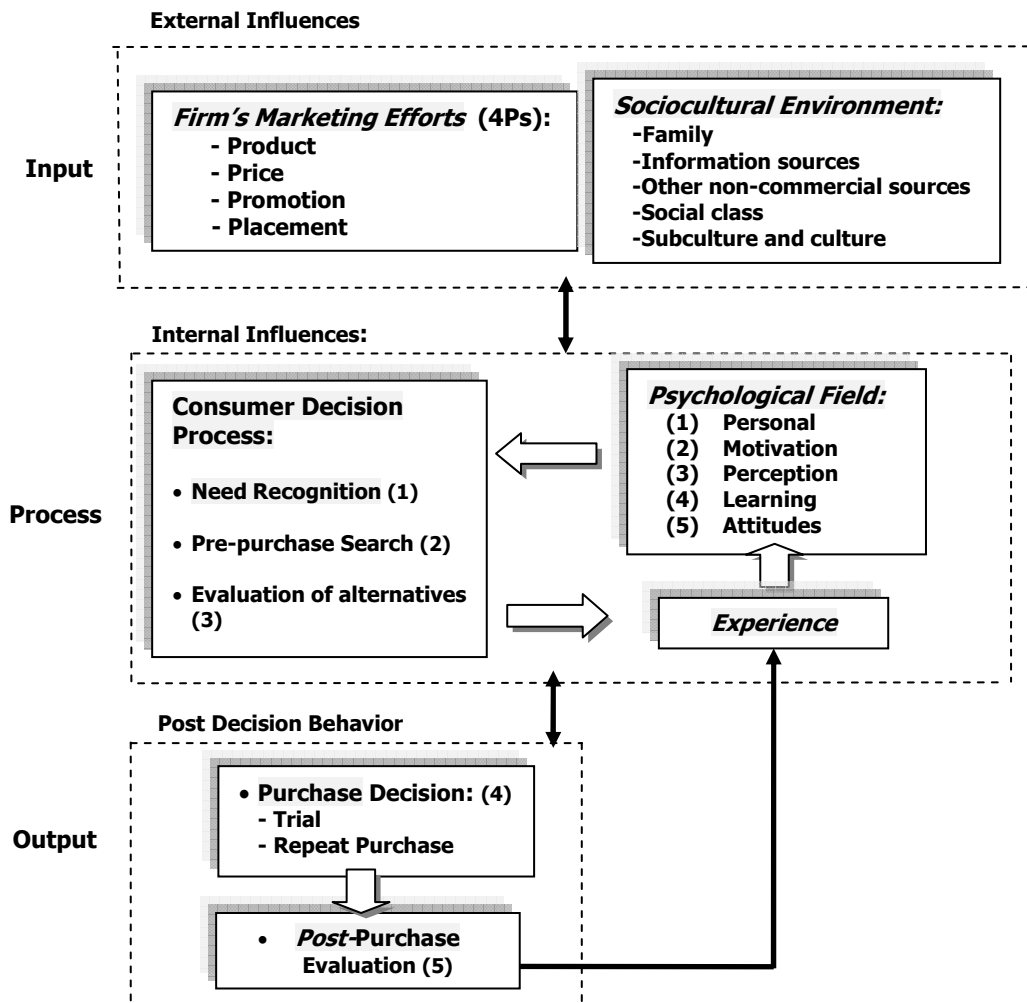


Figure 2.2  A simple model of consumer decision process
Source:  Schiffman and Kanuk (2007)

As shown in Figure 2.2, there are three stages in the model of consumers' decision-making process. Here in the input stage, the marketing mix activities of organizations/firms show their attempts to communicate the benefits of their products and services to potential consumers. They tried to reach, inform, and persuade consumers to purchase and use their products. While the socio-cultural environments that consist of a wide range of non-commercial influences are important input factors, they affect the ways a consumer evaluates and ultimately adopts (or rejects) those products (Schiffman and Kanuk, 2007).

In the process stage, the component is concerned with how consumers make decisions. The psychological factors represent the internal influences that affect consumers' decision making processes. As pictured in the process component, the act of making consumer decision consists of three stages, namely need recognition, pre-purchase search and evaluation of alternatives. Lastly, the output stage concerns with purchasing behaviors and post-purchasing evaluation (Schiffman and Kanuk, 2007).

Here some details of explanation about decision process as follows:

(a) Need recognition/identifying the problem

The purchasing process starts when the buyer recognizes a problem or need. Lake (2009) stated that a need could be triggered by either internal stimuli (those things from within that get the consumer to do or buy something) or external stimuli (the outside influences that get the people to do or buy something). At this stage, the marketers must determine the factors and situation that trigger consumer's problem recognition, what they needs and wants actually.

(b) Search information

Kotler (2001) explained that an aroused consumer may or may not search for more information. If the consumer's drive is strong and satisfying product is near at hand, then the consumer is likely to buy it at that moment. If not, the consumer may simply store the need in memory and search for relevant information. By gathering information, consumers increase their awareness and knowledge of available choices and product features (Kotler, 2001). Lake (2009) stated that consumers are often using several sources for information such as personal sources, commercial sources, public sources and experiential sources.

(c) Evaluation the alternatives

During this part, the consumer processes the information, tries to identify, assess and evaluate the value of alternatives, then finally arrives at his/her decision. If attractive alternatives are available, a consumer will work to determine which criteria to evaluate and will judge each alternative's relative importance when it comes to making the final decision (Lake, 2009). The consumer ranks brand in the choice sets and forms purchse intention (Kotler, 2001).

(d) Purchase decision

After a consumer evaluates and selects the best alternative, he or she is ready to purchase (Lake, 2009). However, the consumer must now determine

whether they feel that they purchase a product or service that has value and beneficial for them. In general, they will buy the most preferred brand and quality (Kotler, 2001). Purchasing value is the perception of the worth the consumer is getting by purchasing product. It is not just about price; it's also about service, quality, and experience (Lake, 2009).

(e)  Post-purchase behavior

This phase in the purchasing process focuses on the psychological response of the buyers to their purchase decision (Lake, 2009). In this phase, the consumers often undergo a degree of reflection about their purchase decision whether they make the right choice or not. They may also consider the effort they put into this purchase and the worth of the initial expense. The consumer who has made a high-involvement purchase spends the most time in this phase (Lake, 2009). The main points in this phase are that the consumers try to compare their level of satisfaction or dissatisfaction based on their expectations and perceptions (Lake, 2009). If the product matches with their expectations, the consumers are satisfied, if it is short they experience dissatisfaction (Kotler, 2001).

## 2.5  Factors affecting the decision process

In general, there are two categories of personal influences regarding the purchase decision of products/services, namely internal factors (i.e., perceptions, attitudes, lifestyles and rules) and external factors (such as cultures, family structures, and group of references) that have an effect on the individual. Chamanifard (2011), states that consumers typically evaluate several attributes of a food product such as its price, quality, or nutritional value before making a purchase decision. During the decision process, consumers rely on their experiences with a product, available product information, knowledge about its attributes, and other factors that can influence their purchasing decision (Chamanifard, 2011).

### 2.5.1  Socio-economic characteristic of consumers

Consumers have a perceptual map that influences every part of the way they lead their lives including the consumer decision process (CDP). At each stage of CDP, personal variables such as age, sex/gender, level of education, occupation and level of income affect how consumers make a choice to purchase and to use

products and services (Schiffman and Kanuk, 2007). Grossman (1972) in his studies analyzing consumer's health and food behavior included a number of socio-economic and demographic variables (i.e., age, education, income, gender). These variables likely influence individual behavior and hence affect the utility of consumption decisions. These variables can be described in detail as follow.

1) Age

Age is one of the personal factors that causes different consumption behaviors of each person. The different level of age causes each individual to have different experiences, knowledge, behaviors, and perceptions. Herve and Mullet (2009) conducted research that examined the effect of age on the importance given to each factor when judging the acceptability of products and services. Age is one factor that is used to discover the needs and wants of specific groups of consumers or market segmentation (Schiffman and Kanuk, 2007). A previous study done by Rozin *et al.* (2002) informed that young consumers tended to be less consciousness, focused more on fat, and weighted more than elder consumers.

2) Sex/gender

In the market segmentation, sex or gender is one of variables that affect the consumption of products and services. Sheth and Mittal (2001) explained that gender is a biogenic group trait that divides customers into group - male and female that remain constant throughout a person's life and it influences consumer values and preferences. Many products are designed based on gender orientation. For instance, the products for males or boys are associated with blue color, while females or girls tend to be pink (Schiffman and Kanuk, 2007). A previous study carried out by Johansen *et al.* (2011) about motivation for choice and healthiness perceptions of calorie-reduced dairy products found that women were more concerned with their diet/weight and health control, while men tended to focus more a pleasure and sensory perceptions.

3) Marital status

Generally, family has been a focus of most marketing efforts for many products and services. Household continues to be the relevant consuming unit (Schiffman and Kanuk, 2007). Marketers are interested in targeting special marital status whether in the number and kinds of household, such as singles, divorced

individuals, single parents and dual-income married (Schiffman and Kanuk, 2007). The marital status of consumers has relationships with opinions on the purchasing decision process of products and services. Marital status is also important factor in marketing segmentation to target specific groups of consumers such as the number and types of family.

4) Level of education

Level of education is another factor that has a role in consumer decision process of purchasing products and services. It also has a significant correlation with knowledge and consumers acceptance of products and services (Engel *et al.,* 1995)

5) Income and occupation

Income of consumers has an influence on their consumption because it is a factor that determines their purchasing power. Income is defined as money from wages and salaries as well as interest and welfare payments (Blackwell *et al*., 2006). Income is also an important variable for distinguishing markets segments, because it is a strong indicator of the ability (or inability) of consumers to pay for a product or a specific model of the product (Schiffman and Kanuk, 2007). According to the economic theory, the trend in the purchase of products and services is increased along with the increase of consumer income keeping the prices of goods and services remain constant. In other words, "change in income causes change in consumption".

Schiffman and Kanuk (2007) stated that income is often combined with other demographic variables to more accurately define target markets. Furthermore, they also mentions that education, occupation and income tend to be closely correlated in almost a cause-and-effect relationship. According to Engel *et al.* (2000), occupation is the best single proxy indicator of social class. Furthermore, some items such as leisure time, income independence, knowledge, and power are often common to occupational categories. Research conducted by Hodge *et al.* (1956) and Duncan (1961) indicated that the key variables causing occupation to have prestige are the amount of education required as a prerequisite for entering the occupation and the typical income earned, a measure of the reward that society bestows on the occupation.

Education, occupation, and income tend to be closely correlated in almost a cause-and-effect relationship (Schiffman and Kanuk, 2007). High-level occupations that produce high incomes usually require advanced educational training. Individuals with little education rarely qualify for the high-level jobs.

Research reveals that consumers with lower incomes, lower education, as well as those who are manual workers (blue-collar occupations), tend to spend more time online at home than those with higher income and higher education (white-collar occupations) (AC Nielsen, 2000 cited by Schiffman and Kanuk, 2007).

**2.5.2 Consumers' knowledge of product**

Knowledge can be defined as information stored in memory that is relevant to the purchase, consumption and disposal of products and services (Blackwell *et al.*, 2006). It can be seen that what we know or do not know strongly influences our decision making processes. Beyond affecting how a decision is made, consumer knowledge may also determine the final decision itself (Moorman *et al.*, 2004). According to Blackwell *et al.* (2006), there are five types of consumer knowledge, namely (1) product knowledge, (2) brand knowledge, (3) consumer or usage knowledge, (4) persuasion knowledge, and (5) self-knowledge. An understanding of consumers' knowledge is also important to public policy makers and essential for marketers to build the appropriate marketing strategy of products and services (Engel *et al.*, 2000).

Another aspect about consumers' knowledge is purchase knowledge. It covers the various pieces of information consumers possess in order to acquire products and services. The basic dimensions of purchase knowledge involve information concerning the decisions of *where* the product should be purchased and *when* purchase should occur (Engel *et al.*, 2000).

Product knowledge comes in various forms such as a product's features for its intended purpose, what goes with what -a product's associations, and how a product works. It would encompass: (1) awareness of the product category and brands within the product category, (2) product terminology, (3) product attributes or features, and (4) beliefs about the product in general and about specific brands (Engel *et al.*, 2000).

An attitude is defined as a kind of psychological tendency that is articulated by assessing a particular entity with some degree of favor or disfavor (Eagly and Chaiken, 1993). The affective, cognitive, or behavioral responses resulting from the attitude relate to the process of evaluation (Frewer, 2003). Further, evaluative responses are those which express approval or disapproval, liking or disliking, attraction or aversion. Attitude cannot directly be observed, but can be inferred from observable responses to questionnaires or interviews (McCorqual and Meehl, 1948 cited by Menrad and Sparke, 2006). Consumer researchers assess attitudes by asking questions or making inferences from consumer behavior (Schiffman and Kanuk, 2007). Menrad and Sparke (2006) stated that a change of attitudes might occur when a consumer received some additional information/knowledge that would influence either the extent of the attitude's strength or its direction. Further, they also informed that the source of such influencing information can be a communicating person or institution such as government, a food company, doctor recommendation or neutral consultant. A person's attitude has a direct influence on food buying/food acceptance and food choice (Poulsen, 1999 cited by Menrad and Sparke, 2006).

### 2.5.3 Characteristics of marketing mix (4Ps)

Generally, marketing strategy is correlated with marketing mix. Contantides (2006) states that marketing mix is considered to be a toolkit for transaction marketing theory and operational marketing management. It also can be defined as "the set of controllable tactical marketing tools (4Ps) that the firm blends to produce the response to wants in the target market (Kotler, 2001).

There are four main areas of interest in marketing mix (called the 4Ps) which is very important in business. The 4Ps (product, price, place and promotion) provide with the foundation that the marketing plan is built around, (1) products represent what the target market is looking for, (2) price of the product gauges what the products will sell for in the marketplace based on the selected target market and what that market can afford, (3) place refers to how the business/company distribute the products and (4) promotion is the way how the business/company promotes the products to target market (Blackwell *et al.*, 2006).

Kotler and Amstrong (2006) explain that an effective marketing program blend all of the marketing mix elements into an integrated marketing program designed to achieve the company's marketing objectives by delivering value to consumers. Additionally, they stated that marketers use a variety of research technique to measure progress toward objectives and identify area for improvement if the results fall short of projections.

1) Product

A product is any combination of products and services offered to satisfy the needs and wants of consumers (Truell, 2006). It covers the shape or form of what is offered to prospective customers. Verbeke and Viaene (1998) identified several attributes used to a survey of cross-regional consumer behaviors on yogurt and dairy products such as taste, brand, nutritional value, naturalness, microbial and chemistry safety, dietetic value, smell and appearance. In this study, researchers attempt to focus on three of product attributes, namely brand, price, and taste.

Previous studies about "Consumer behavior towards yogurt in Belgium and Poland" conducted by Verbeke and Viaene (1998) reported that brand is the most choice-determining factor for three-quarters of the Polish, compared with half of the Belgian yogurt consumers. Additionally, there is also an evidence in marketing field that branding influences consumer behaviors (Vranesevic and Stancec, 2003) and plays important roles in consumers' appreciations of food (Jaegar, 2006).

Consumers often attribute quality to branded products on the basis of price, brand reputation, store image, market share, product features, and country of manufacture (Lambert, 1980), as well as for services, reliability and warranty (Grunert and Sorensen, 1996). Tidwell *et al.* (1993) examined the self-image, brand image and brand royalty on his research and the result showed that the importance of brand selection had been linked to self-expression or self-image.

Furthermore, taste is one of the important attributes used on consumer decision process of purchasing products. It is such a key success factors of products existence in the market. Chandan *et al.* (2006) also reported that flavor was the critical criterion of quality to the consumers. For instance, cheese, milk, yogurt, etc were kinds of products that were influenced by taste. Research conducted by

Nilasari (2009) showed that taste was used as a product indicator for consumers to determine on a purchase of liquid milk in Malang city, Indonesia. Urala and Lahteenmaki (2003) in their research with a title "Reason behind consumers' functional food choices" reported that taste and sensory quality was one of the reasons mentioned by most of the consumers for choosing yogurt, ice cream, juice and sweets. Another studies conducted by Verbeke and Viaene (1998) informed that the taste of product was perceived as the most important quality of yogurt cues by the overall samples, both in Belgium and Poland. Further, taste led to general well being in yogurt.

2) Price

Truell (2006) defines price as the amount of money that consumers are willing to pay for a product and/or service. Middleton (1994) stated that price denoted the published or negotiated terms of the exchange transaction for a product, between a producer aiming to achieve predetermined sales volume and revenue objectives and prospective consumers seeking to maximize their perceptions of value for money in the choices they make between alternative products.

However, the importance of price as a determinant varies by types of products (Blackwell *et al.,* 2006). It depends on the nature of the consumers. Some consumers preferring factors such as convenience will, in effect, trade off that consideration against higher prices (William *et al.*, 1978, cited by Blackwell *et al.*, 2006). Previous studies conducted by Verbeke and Viaene (1998) implied that the average attitude scores differ significantly between Belgium and Poland, especially for price of yogurt. On an average, Polish consumers agree with the statement that yogurt was expensive product, while Belgium was disagreeing.

According to Monroe (1973), consumers' perceptions of price is usually more important than actual price. The literature indicated that product attributes such as brand and price are used as expression of self, or to indicate prominent and status of a person (Tidwell *et al.,* 1993; Lichtenstein, 1993). Some marketers use price as a signal of quality (Shugan, 1985) and some consumers believe that higher prices are indicators of better quality (Tellis and Gaeth, 1990).

3) Place

Place refers to having the right product/service, in the right location, at the right time to be purchased by consumers. This proper placement of products is done through middle people called the channel of distribution (Truell, 2006). For most consumers, placement or location is perceived in terms of time and complexity as well as actual distance (Blackwell *et al.*, 2006). Cognitive maps or consumers perceptions of store locations and shopping areas are more important than actual location (Mackay and Olshavsky, 1975) because they represent the distance and time consumers perceive for their travel to reach and shop at the store. Consumers generally overestimate both functional (actual) distance and time (Mazze, 1974).

4) Promotion

The most visible of the four P's of marketing mix is promotion. Promotion is communication process that takes place between a business and its various publics (Truell, 2006). It includes several kinds of activities such as: advertising, sales promotion, merchandising, sale-force activities, brochure production, direct mailing, and public relation activities (Kotler, 2001). Advertising and other forms of promotion are important tools to create a retail brand which includes image and information (Blackwell *et al.*, 2006). Image advertising uses visual components and words that help consumers form an expectation about their experience in the store and about what kinds of consumers will be satisfied with the store's experience. On the other hand, information advertising provides details about products, prices, placement and attributes that might influence purchase decision (Blackwell *et al.*, 2006).

The main point of promotion techniques are used to make prospective consumers aware of products, to fulfill their needs and wants, and to stimulate market demand. Furthermore, it also provides information for consumers in process to make purchasing decision towards products and services. All of the promotion activities involve some means of communicating with potential consumers (Mill and Morrison, 1992).

## 2.6 Logistic regression analysis

Logistic regression is used for prediction of the probability of occurrence of an event by fitting data to a logistic curve which is a generalized linear model used for binomial regression (Wikipedia, 2011). According to Dayton (1992),

logistic regression analysis (LRA) extends the techniques of multiple regression analysis to research situations in which the outcome variable is categorical. Similarly, Leech *et al.* (2005) states that it is helpful when the researchers want to predict a categorical variable from a set of predictor variables.

Dayton (1992) also explained that LRA was based on probabilities associated with the values of Y which the model for logistic regression analysis assumed that the outcome variable (Y) was categorical (i.e., dichotomous). For simplicity, and because it is the case most commonly encountered in practice, it can be assumed that Y is dichotomous, taking on values of 1 (i.e., the positive outcome, or success) and 0 (i.e., the negative outcome or failure). Leech *et al.* (2005) mentioned that LRA was useful because it did not rely on some of the assumptions on which multiple regression and discriminant analysis were based.

Logistic regression analysis examines the influence of various factors on a dichotomous outcome by estimating the probability of the event's occurrence. It does this by examining the relationship between one or more independent variables and the log odds of the dichotomous outcome by calculating changes in the log odds of the dependent variable as opposed to the dependent variable itself. The use of the log odds ratio in logistic regression provides a more simplistic description of the probabilistic relationship of the variables and the outcome in comparison to a linear regression by which linear relationships and more rich information can be drawn (Dayton, 1992). In other words, it allows the researchers to assess how well the set of predictor variables predicts or explains the categorical dependent variable and give an indication of the adequacy of the model by assessing "the goodness of fit" (Pallant, 2005)**.**

The first assumption in logit model approach is based on random utility theory in choice modeling is that the respondents are rational and, among a set of alternatives, will choose the alternative which maximizes their utility (the decision makers are maximizing utility) (Chamanifard, 2011).

In addition, Morrison (1996) reported that the logistic regression model could be used for "what-if" analysis and to produce a list by ranking each observation from the highest to the lowest based on the expected purchase probability.

### 2.6.1 Binary logistic regression

Binary logistic regression is similar to linear regression except that it is used when the dependent variable is dichotomous or with only two categories/values (Leech *et al.,* 2005) which the dependent variable can take the value 1 with a probability of success θ, or the value 0 with probability of failure 1-θ (Raghavendra and Antony, 2011).

A binary logistic model specification was chosen for this study where the dependent variable are limited of two alternatives and is a simple "Yes 1 / No 0" questions, representing consumers who are likely to purchase yogurt or unlikely to purchase, respectively. The vector of estimated coefficients, *β*, shows the impact of changes in (X) on the probability of (Y) (Greene, 2003).

Prob (Y 1 | X) F (X, β)

Prob (Y 0 | X) 1 - F (X, β)…………………………………… (1.3)

The Latent Regression model for an unobserved variable (Y*), assuming an error term (ε) with zero mean and standardized logistic distribution with known variance ($\pi^2/3$) and (X′ β) to be the index function, would be (Greene, 2003):

Y* X′ β + ε …………………………………………………(1.4)

and the observation would be:

Y 1 if Y* > 0

Y 0 if Y* ≤ 0 ……………………………………………… (1.5)

Therefore, if a respondent is consumer who purchase yogurt, the variable (Y) is one (Y 1 if Y* > 0), otherwise it is zero. The binary logistic model in case of consumers' purchase decision towards yogurt is:

Y $\beta_1$+ $\beta_2$X + $\varepsilon_i$ ……………………………………………. (1.6)

### 2.7 Conceptual and analytical framework

The conceptual framework for this research is derived from two models of Schiffman and Kanuk (2007) about consumer purchasing decision combined with factors influencing the consumer purchasing decision by Engel *et al.* (1995).

The concept of consumers' perceptions and purchasing decision towards yogurt is influenced by various factors of internal and external origins. The

internal factors involved in this study are personal (socio-economic) characteristics of consumers and their product knowledge. The external factors are determined by using the 4Ps of marketing mix of yogurt and the socio-cultural characteristics of consumers (i.e., family). The study explores how the marketing mix variables influence consumers' purchase behavior towards yogurt.

Both of internal and external factors affect the consumers' perceptions towards yogurt. Afterwards, the 4Ps items of marketing mix of product are examined by five-scale intervals of Likert scale, which are analyzed using the ordered logistic regression model. Then, continued by analyzing the consumers' purchasing decision towards yogurt using the binary logistic regression model based on the Yes 1 (consumers likely to buy/purchase) and No 0 (consumers likely not buy/not purchase) questions.

The following Figure 2.3 describes the conceptual and analytical framework of this study in details.

- **Problem Statement:**
  - Rising consumer demand for convenient, combined with a healthy diet and preferences for natural food ingredients has led to a growth in functional food and beverage markets, i.e., yogurt
  - Changing consumer needs and trend/lifestyle
  - Consumer perceptions have important roles to be analyzed in order to expand markets of yogurt.

**1) Consumers' Perception on "4Ps"**

(1) Consumer Perceptions on Product
  - PdP = f (Internal Influences, External Influences, location dummy)
(2) Consumer Perceptions on Price
  - PrP = f (Internal Influences, External Influences, location dummy)
(3) Consumer Perceptions on Place
  - PlP = f (Internal Influences, External Influences, location dummy)
(4) Consumer Perceptions on Promotion
  - PmP = f (Internal Influences, , External Influences, location dummy)
(5) Overall Perceptions
  - Over P = f (Internal Influences, External Influences, PdP, PrP, PlP, PmP, location dummy)
- Product, Price, Place, Promotion (4Ps) are measured using five-scale intervals of Likert scale technique and Chi-square

- **External Influences:**
  - Socio-cultural (i.e., family)

  External factor is measured using binary data (0,1) and Likert scale (1-5)

  Descriptive Analysis is used to explain the external influences

- **Internal Influences:**
  - Personal / socio-economic characteristics

  Internal factor is measured using various kinds of data scaling

  - Descriptive Analysis: (frequency, percentage, mean, S.D.)
  - Chi-square test
  - Spearman's Rank correlation coefficient
  - Likert scale used for measuring perceptions

**2) Consumers' Decision to Purchase yogurt**
( Decision → Purchasing )

**Model of CDP:   DtP = f (Internal Influences, External Influences, location dummy)**
**DtP = 1   if consumers are likely to purchase**
**= 0   if consumers are unlikely to purchase**

  - Binary logistic regression analysis is used for the estimation

- Identification of marketing strategies of yogurt in Malang city, East Java province, Indonesia.
- Contributions to the dairy industry to develop marketing strategies for yogurt, especially in Malang city

Figure 2.3 Conceptual and analytical framework of the research

# CHAPTER 3
## Research Methodology

This chapter intends to describe research methodology used in this study including research sites/areas, population and sampling, data collection and research tools, survey design, research hypothesis, models, data analysis and scope of the research. This information provides a better understanding of this research.

## 3.1 Research sites/areas

This research was conducted in Malang city, East Java Province, Indonesia. Malang was selected due to its status as the second largest cities in East Java Province, after Surabaya city. Malang city is on a high land with the height of 440-667 m above sea level. Malang has a total area of 252 km$^2$ and it is around 110 km² for Malang city. There are roughly 1,175,282 people living in Malang and around 820,857 in Malang city in 2009. Malang city is famous with the slogan of "Tri Bina Cita" meaning education city, industrial city and tourism city that reflects profile of Malang city economic potential (Malang city in Figures, 2010 cited by Bureau of Statistic Indonesia, 2010).

Malang lies between 112.06$^\circ$-112.07$^\circ$ East Longitude, 7.06$^\circ$-8.02$^\circ$ South Latitude with bordering districts as follow:

- North : Singosari District and Karangploso District
- East : Pakis District and Tumpang District
- South : Tajinan District and Pakisaji District
- West : Wagir District and Dau District

In terms of milk production, almost ninety percent of all dairy cows production in Indonesia are located on the island of Java mainly in the three major fresh milk production areas of East Java, Central Java and West Java with East Java being the largest milk producer accounting for 57 percent of Indonesia's milk production (Morey, 2011). Over the five years, East Java Province has shown the largest growth with dairy cow population and milk production increasing annually by an average of 14.6 percent and 24.3 percent, respectively (Morey, 2011).

Moreover, Morey (2011) also stated that Malang city, East Java is one of five cities in Indonesia that produces the largest Indonesia's milk with 146,121 tonnes of milk in 2010. Therefore, Malang city was chosen as the research area in this study due to these reasons.

Administratively, Malang city was divided into 5 sub-districts (see Figure 3.1), namely Lowokwaru sub-district with a population of 182,794, Sukun sub-district (175,772 people), Blimbing sub-district (171,935 people), Kedungkandang sub-district (162,941 people) and Klojen sub-district (127,415 people).
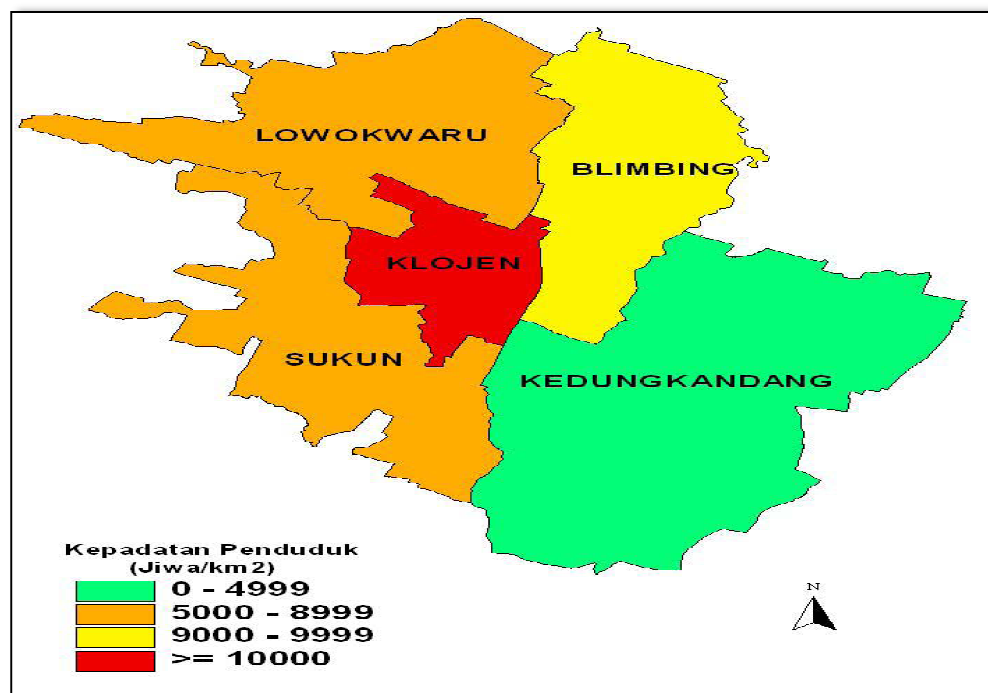


Figure 3.1 Population density map by sub-districts of Malang city

Source: Malang city in figures (2010) cited by Bureau of Statistic Indonesia (2010)

Region or sub-districts with the highest population density as shown in Figure 3.2 is Klojen with approximately 14,430 people per km$^2$ while the lowest is Kedungkandang with 4,085 people per km$^2$ (Malang city in Figures, 2010 cited by Bureau of Statistic Indonesia, 2010).
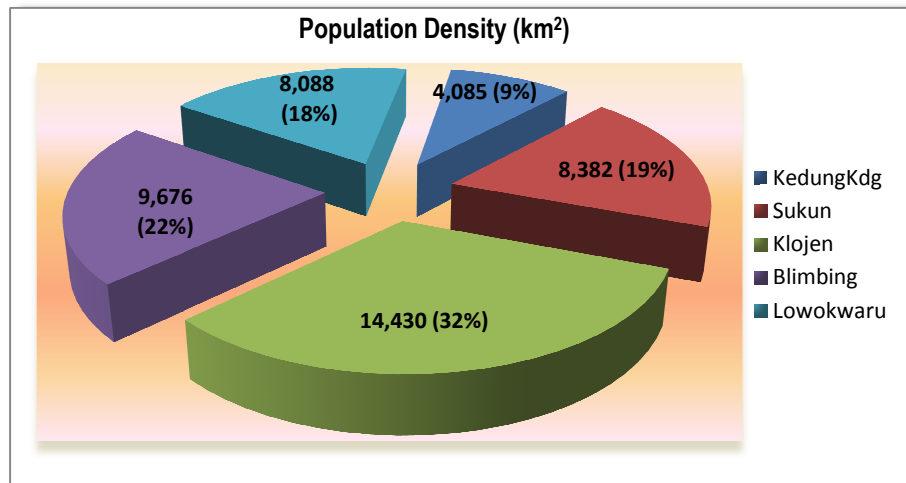
Figure 3.2  Percentage and population density of Malang City

Source: Malang city in figures (2010) cited by Bureau of Statistic Indonesia (2010)

Furthermore, district areas ($km^2$) and percentage by city area of Malang city are shown in the following Table 3.1.

Table 3.1 District areas and percentage of city area of Malang city (2009)

| District | District areas ($km^2$) | Percentages of City area |
|---|---|---|
| (1) | (2) | (3) |
| Kedungkandang | 39.89 | 36.24 |
| Sukun | 20.97 | 19.05 |
| Klojen | 8.83 | 8.02 |
| Blimbing | 17.77 | 16.15 |
| Lowokwaru | 22.60 | 20.53 |
| **Total** | 110.06 | 100.00 |

Source: Malang city in Figures (2010) cited by Bureau of Statistic Indonesia (2010)

Basically, Malang city is categorized as urban area including five of its sub-districts. However, to minimize the scope of research and the obstacles encountered during the survey, the researcher distinguished the areas into two group's namely urban and sub-urban areas. The distinction based on the socio-economic characteristics of the people, number of population, and numbers of markets (yogurt stores) that exist in the five sub-districts. Here, urban area consists of Klojen, Lowokwaru, and Blimbing sub-districts, while the sub-urban area consists of Sukun and Kedungkandang sub-districts.

The total number of markets that distribute yogurt (Indomarket), in the five sub-districts in Malang city is around 65 (Trade and Industry Department of Malang city, 2011). The highest number of distributors is Lowokwaru sub-district (22 markets), followed by Klojen sub-district (15 markets), Blimbing sub-district (12 markets), Kedungkandang sub-district (9 markets) and Sukun sub-district (7 markets). This is in line with the number of yogurt producers who produce and sell yogurt. Data from the Department of Trade and Industry of Malang city (2011) shows that the highest number of yogurt selling centers are in Klojen and Lowokwaru sub-districts with approximately 35 yogurt stores. Lowokwaru and Klojen is also known well as a center of administration in downtown Malang city and the center of academic activities (more than ten universities) are located in both sub-districts.

## 3.2 Population and samples

A population is an identifiable total group or aggregation of elements (i.e., people, organizations, product and physical entities that are of interest to the researchers and pertinent to the specified information problem (Hair *et. al.*, 2000).

### 3.2.1 Target population

According to Schmidt and Hollensen (2006), target population is the grand total of what is being measured such as consumers, stores, households or whatever. "Target" refers to the conditions that separate those who are of interest to a research project from those who are not. The target population utilized in this research are:

- The consumers either they are buyers or non-buyers who are living in Malang city and in location of markets/yogurt stores both in urban and sub-urban areas.

- The urban area includes three sub-districts namely Klojen, Lowokwaru and Blimbing sub-districts, whereas the sub-urban area includes Sukun and Kedungkandang sub-districts.

- The respondents' age ranging from 15-60 years old (female and male) with assumption that in this range of age they can give perceptions and opinions about yogurt.

### 3.2.2   Sample size

A sample is a subset of the population that is used to estimate the characteristics of the entire population. Therefore, the sample must be representative of the universe under study (Schiffman and Kanuk, 2007). The definition of sample size according to Peers (1996) is one of the four inter-related features of a study design that can influence the detection of significant differences, relationships, or interactions.

Accidental sampling method is used for this study. Powell (1997) explained that accidental sampling was a type of non-probability sampling which involved the sample being drawn from that part of the population which was close to hand. According to Dattalo (2008), accidental sampling was a technique in which elements were selected because of their accessibility to the researcher; a sample was selected because it was readily available and convenient. In this study, schedule of accidental sampling uses alternating date/day and place.

A total population in Malang city 2009 is around 820,857 people. Within range of age from 15-60 years are totally around 530,306 people (Statistic of Malang, 2010 cited by Malang city in figures, 2010). Yamane (1973) formula was chosen due to its familiar use in social science researches and the precision is considerably sufficient. According to Mora and Kloet (2010), by using the Yamane formula, it could easily determine the minimal sample size that we had to investigate for any given population size. Furthermore, the downside of this formula is that it gives at most of 95% confidence level (Mora and Kloet, 2010). Krejcie and Morgan (1970) stated that the general rule relative to acceptable margins of error in educational and social research were 5% for categorical data and 3% margin of error was acceptable for continuous data. In addition, Bartlett *et al.* (2001) revealed that a 5% of error would result in the researcher being confident for a dichotomous variable that the proportion of respondents who had characters of interest was within ± 5% of the proportion calculated from the research sample. By using Yamane formula, the total number of sample used in this study is obtained as follows:

$$n = \frac{N}{1 + Ne^2}$$

where  n represents sample size,

N represents population size, and

e represents the level of precision (0.05).

$$n = \frac{530.306}{1 + 530.306 \cdot (0.05)^2}$$

$n = 399.70$

$n = 400$ respondents.

The total 400 respondents were divided into 300 respondents (buyers and non-buyers) for urban and 100 respondents (buyers and non-buyers) for sub-urban. Every third eligible consumers either buyers or non-buyers of yogurt in market/store of yogurt was selected for the interview for around 10-15 minutes per respondent.

## 3.3  Data collection

Data source is an important factor to be considered in determining the method of data collection. In this research, there are two types of data needed, (1) *primary data* defined as original data performed by researchers or organization such as responses to a questionnaire or interview to meet specific objectives (Schiffman and Kanuk, 2007), and  (2) *secondary data* are data that have been collected by someone else for another purpose such as government statistical reports, articles in professional journals or agency records (Schmidt and Hollensen, 2006).

In this research, the primary data were obtained through a structured questionnaire survey using Likert interval scale (Wilkinson and Bhandarkar, 2004) and Multiple-Choice (MC) questions based on Sato (2004). Likert scale with five response categories, was used to measures attitude scale of consumers which indicated degree of agreement or disagreement (Verbeke and Viaene, 1998) and was chosen because it was easy to prepare, to interpret and it was simple for consumers to answer (Schffman and Kanuk, 2007). A five point Likert scale was used ranging from "strongly disagree" with a score of 1 to "strongly agree" with a score of 5. The assessed level of agreement were ranged at an interval of 0.80 as follows:

The interval = (Maximum – Minimum)/n

$$= (5 - 1) / 5$$
$$= 0.80$$

Therefore, the five intervals of score and levels of consumers' perception are shown in Table 3.2.

Table 3.2 Five-intervals score of Likert scale on consumers' perceptions

| A five-point Likert scale | Mean score at interval 0.80 | The consumers' perceptions level |
|---|---|---|
| 5 | 4.21 – 5.00 | Highest |
| 4 | 3.41 – 4.20 | High |
| 3 | 2.61 – 3.40 | Moderate |
| 2 | 1.81 – 2.60 | Less |
| 1 | 1.00 - 1.80 | Least |

The secondary data collected from different sources such as:

1) Numerous books, journals/research papers, articles, book report annually, and government statistical report (i.e., BPS) as well as data of population density, population growth rate, male and female ratio, and data of income per capita per month.

2) Internet sources or online information and news from many websites concerning with consumers' perception and decision to purchase yogurt.

## 3.4  Research tools

The main tool in this research is a *questionnaire.* A questionnaire is a data collection instrument, formally setting out the way in which research question should be asked (Schmidt and Hollensen, 2006). The questionnaire that used in this study was originally written in English then translated into Indonesian languages (Bahasa Indonesia) as adjusted to both of research site and sample of respondents.

Before it was applied in the survey, Likert scale interval questions were pre-tested using Cronbach's alpha. In this study, Cronbach alpha coefficient was utilized to test the internal consistency for all items under their respective variables (Campbell *et al*., 2007). In other words, the Cronbach's alpha ensures the consistency or stability of items on questionnaire and used to analyze the reliability of data. Calculating Cronbach's alpha is the most commonly used procedure to estimate reliability, because it is highly accurate and has the advantage of only requiring a single application of the scale (DeCoster, 2000). Furthermore, Gliem and

Gliem (2003) reported that Cronbach's alpha was a reliability test technique that required only a single test administration to provide a unique estimate of the reliability for a given test. Basically, reliability has specific implications for the utility of the scale, therefore, the higher the reliability of the scale, the easier it is to obtain significance (DeCoster, 2000). According to Sekaran (2003), if reliability of value was less than 0.6, they were generally considered as poor, those in a range of 0.7 are acceptable and those over 0.8 are good.

The result of reliability test using ordinary Cronbach's alpha using 30 samples out of target population showed the values of all questions of marketing mix (4Ps) of yogurt in Table 3.3 as follows:

Table 3.3 The ordinary Cronbach's alpha value of marketing mix of yogurt in Malang city, East Java province, Indonesia

| Items of 4Ps | Original score of ordinary Cronbach's alpha | Number of items Deleted | Final score of ordinary Cronbach's alpha |
|---|---|---|---|
| Product | 0.6140 | 3 | 0.7121 |
| Price | 0.4820 | 2 | 0.6603 |
| Promotion | 0.7281 | 0 | 0.7281 |
| Place | 0.7703 | 0 | 0.7703 |

The Cronbach's alphas score of '3P' (i.e., Product, Promotion and Place) are around 0.70, meanings that the items were acceptable and have good/reasonable internal consistency reliability, but the 0.66 alpha for the price of products scale indicated minimally adequate reliability (Leech *et al.,* 2005) or poorly reliable (George and Mallery, 2003). This may be due to lack of strong correlations between items within a group of price questions. The other possibility was lack of number of items. Field (2005) also explained that the value of alpha depended on the number of items on the scale Therefore, one way to make a sum scale more valid is by adding items on the scale. However, in practice, the number of items on a questionnaire is usually limited by various other factors such as respondents' tiredness or limited time. Furthermore, the low reliability has its meaning that it is quite difficult to find the chances of finding significant results (DeCoster, 2000).

The third column in Table 3.3 shows values of Cronbach's alpha after some of respective items were deleted. They reflect the change in Cronbach's alpha if a particular item were deleted. This can be seen that the deletion of an item

increase the Cronbach's alpha and the reliability as well. Results shows that the reliability of the Product and Price items increase to 0.71 and 0.66 if 3 and 2 questions are deleted, respectively. Details of these tests are presented in Appendix F.

In addition, the questionnaire also was tested with respect to its content validity. It was presented to thesis advisors to consider each question if it was in line with the content of the thesis. The questionnaire was edited appropriately for its language usage, coverage of contents and correctness.

The questionnaire utilized in this research is separated into three parts as follow: (1) consumer socio-economic or personal characteristics (2) consumers' knowledge on yogurt or product knowledge (3) consumers' perceptions and knowledge of marketing mix (4Ps) and consumers' decision to purchase yogurt (Appendix A).

## 3.5  Survey design

Survey is an efficient way of gathering data and information from a large sample of consumers by asking question and recording responses (Blackwell *et al.*, 2006). Bartlett *et al.*, (2001) also reported that a common goal of survey research was to collect data representative of a population and then used this information to generalize findings from a drawn sample back to population, within the limits of random error. In addition, Schmidt and Hollensen (2006) explained that the survey provided important advantages of standardization such as easy administration, discovering motives for behaviors, simple tabulation, and ability to investigate sub-groupings of respondents.

Survey design in this research is mall-intercepting personal interview whereby respondents are intercepted while shopping in the malls/shops/convenient stores. The process involves stopping the shoppers, screening them for appropriateness and interviewing them to complete the interview (Powell, 1997). Blackwell *et al.* (2006) explained that one of the advantages of this method was that the researchers could ask consumers more detailed questions, asked their opinions and showed product samples of different advertisements.

## 3.6  Sampling schedules

Sampling is much more than finding some people to participate in a research study (Hair *et al*., 2003). Therefore, the sampling schedule was designed to make the survey in the field easier and successful as shown in Table 3.4. The gathering of raw data from samples can be later used to analyze and make inferential predictions of the target population.

Table 3.4 Date schedules of sampling survey and number of sampled respondents in both urban and sub-urban areas of Malang city, East Java province, Indonesia

| Time/Number of respondents  Location | Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|---|
| **URBAN:** | | | | | | | |
| **Sub-district 1** (Lowokwaru) | 15-20 | 15 | 15 | 15 | 15 | 15 | 15-20 |
| **Sub-district 2** (Klojen) | 15-20 | 15 | 15 | 15 | 15 | 15 | 15-20 |
| **Sub-district 3** (Blimbing) | 10-15 | 10 | 10 | 10 | 10 | 10 | 10-15 |
| **SUB-URBAN:** | | | | | | | |
| **Sub-district 4** (Sukun) | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Sub-district 5** (Kedungkandang) | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

Note: Every third consumers here interrupted and asked if he/she answer the respond to the survey

Table 3.4 shows the distribution of scheduled collection of samples in five sub-districts of urban and sub-urban areas of Malang city. The number of daily data collection during the survey was around 10-15 respondents and it increased to 15-20 during the weekends due to an increased number of consumers in the targeted areas

## 3.7  Research hypotheses

Research hypotheses are predictive statements about the relationship between the variables (Leech *et al*., 2005). The research hypotheses of this study are as follow:

Hypothesis 1: Consumers' perceptions in terms of marketing mix (4Ps) of yogurt are independent from internal and external influences

Hypothesis 2: Consumers' decision to purchase yogurt is independent from marketing mix (4Ps), internal and external influences

## 3.8  Data analysis

This study adopted both descriptive analysis and functional analysis. Descriptive analysis was used to explain the socio-economic characteristics of respondents in both urban and sub-urban areas of Malang city, while functional analysis was used to measure the parameters of relationships, its prediction of the values of variables and hypothesis testing (Koutsoyiannis, 1977). These analyses can be described in details as follow.

### 3.8.1 Descriptive analysis

The data obtained from the survey were analyzed using descriptive analysis such as percentages, frequency, mean, standard deviation, Chi-square test and Spearman's rank correlation coefficient. Descriptive analysis was applied to explore the overall profile of consumers' characteristics or socio-economic characteristics of consumers such as age, sex, marital status, education level, occupation, and income level. The explanations of each descriptive analysis are as follows:

(1) Percentage is the proportion or rate per hundred parts that is used to make proportion of data on socio-economic characteristics of the respondents.

(2) Frequency is the number of repetitions of a complete sequence of values of periodic function per unit variation of an independent variable (Wikipedia, 2011).

(3) Mean

It is used to estimates the average value when the data have been collected using an interval or ratio scale (Malhotra and Peterson, 2006). In this study, only level of education (years) that were collected by ratio scale.

(4) Standard deviation

The standard deviation is the square root of the variance which is expressed in the same units as of the data. It has the same purpose as variance that is to understand how clustered or spread the distribution is around the mean value.

(5) Chi-square test

It is used to test the statistical significance of the observed association in a cross-tabulation. It assists in determining whether a systematic association exists between two variables (Malhotra and Peterson, 2006). In this study, it was applied to

measure the relationships of socio-economic characteristics of yogurt consumers in Malang city and their perceptions.

(6) Spearman's rank correlation coefficient

It is a non-parametric technique used to test the direction and strength of the relationship/association between two variables (X and Y) or between paired observations when the data are in ranked form (Stevenson, 1978). Gay and Deihl (1992) stated that the Spearman's rank coefficient is the appropriate measure of correlation when the data for one of the variables expressed as rank instead of scores or intervals. Thus, it is appropriate when the data represent the ordinal scale (Hair *et al*., 2000). In this study, Spearman's rank correlation was used to analyze relationships among 4Ps of marketing mix and consumers' perceptions towards yogurt.

(7) Independent sample t-Tests

It was used to test difference between two means on some continuous variables, for two different groups of subjects (i.e., locations separated into: urban and sub-urban area).

### 3.8.2 Functional analysis

In this section, applied econometric research is designed as a part of research method. According to Koutsoyiannis (1977), "applied econometric research is concerned with the measurement of the parameters of economic relationships and with the prediction (by means of these parameters) of the values of economic variables". There are four stages of econometric research used to design the models, namely: 1) the specification of the models, 2) the estimation of the models, 3) evaluation of the model estimates and, 4) evaluation of the forecasting validity of the models (Koutsoyiannis, 1977).

### 1) Specification of the models

It is defined as how the researchers express the relationship between variables in mathematical form that is to specify the model, with which the economic phenomenon will be explored empirically. In other words, the specification of the model is based on the theory and on any available information relating to the phenomenon being studied (Koutsoyiannis, 1977)

1.1) Variables of the models

The following Table 3.5 provides a description of the variables used in the analysis of this study.

Table 3.5 Variables of the study, the definitions and measurement scale

| No | Variables | Definition | Measurement scale |
|---|---|---|---|
| 1 | ***Dependent (Y)*** <br> Consumers' purchasing decision towards yogurt *(Y₂)* | is dependent variable representing consumers' decision to purchase towards yogurt (0 - non-buying and 1 - buying) depicting <u>decision</u> assigned by consumers. <br> - 0 represents consumers unlikely to buy yogurt <br> - 1 represents consumers likely to buy yogurt | Nominal scale |
| 2 | ***Independent/Explanatory (X)*** | | |
| | -Socio-economic characteristics of respondents <br> 1) Age (years) | is age of consumers (in years), using dummy variables <br> - Age1 = 1, 15-20 years old; 0= others <br> - Age2 = 1, 21-25 years old; 0= others <br> - Age3 = 1, 26-30 years old; 0= others <br> - Age4 = 1, 31-35 years old; 0= others <br> - Age5 = 1, 36-40 years old; 0= others <br> - Age6 = 1, more than 40 years old; 0= others | Nominal scale |
| | 2) Sex | is gender status of consumers <br> - Sex1 = 1, if consumers are female <br> - Sex0 = 0, if consumers are male | Nominal scale |
| | 3) Marital Status (MS) | is status of consumer marriages <br> - MS1 = 1, if consumers are married <br> - MS0 = 0, if consumers are single | Nominal scale |
| | 4) Level of education (Edu) (formal education in years) | is number of years in formal education of consumers, using dummy variables as follows: <br> - Junior High School (9 years) <br> - Senior High School (12 years) <br> - Diploma (13-15 years) <br> - University degree ($\geq$ 16 years) | Ratio scale |

Table 3.5 (Cont'd )

| No | Variables | Definition | Measurement scale |
|---|---|---|---|
| 5) | Occupation (Occ) | is types of job of consumers (using dummy variables) as follows:<br>- Occ1=1, if consumers are public or state/government employees, 0 = otherwise<br>- Occ2 = 1, if consumers are private employees, 0 = otherwise<br>- Occ3 = 1, if consumers are businessman/self-employed, 0 = otherwise<br>- Occ4 = 1, if consumers are housewives, 0 = otherwise | Nominal scale |
| 6) | Level of Income (Inc) (Rp/month) | is consumers salary/wage/revenue collected regularly (Rp/month) using dummy variables, divide into six categorical as follows:<br>- Inc1 = 1, if the income level is between (IDR) 500,001 – 1,000,000*, 0 = otherwise<br>- Inc2 = 1, if the income level is between (IDR) 1,000,001 – 1,500,000, 0 = otherwise<br>- Inc3 = 1, if the income level is between (IDR) 1,500,001 – 2,000,000, 0 = otherwise<br>- Inc4 = 1, if the income level is between (IDR) 2,000,001 – 2,500,000, 0 = otherwise<br>- Inc5 = 1, if the income level is more than (IDR) 2,500,000, 0 = otherwise<br><br>**Note**:* 1 BTH =300 IDR (2012)<br>    1 US\$ = 9000 IDR (2012) | Nominal scale |
| 7) | Marketing mix (4Ps) perceptions | are perceptions of 4Ps of marketing mix<br>- PdP is yogurt product characteristics<br>- PrP is yogurt price of product<br>- PlP is yogurt placement of product<br>- PmP is yogurt promotion of product | Interval scale |
| 8) | Location dummy (Loc) | is area or location of research both in urban and sub-urban areas of Malang city, whereas:<br>- 1 = the respondent/participant who lived in urban area<br>- 0 = the respondent/participant who lived in sub-urban area | Nominal scale |

1.2)  Expected signs and magnitudes of parameters

In this study, the researcher assumed that the mathematical function of consumers' purchasing decision towards yogurt are as follows:

$$Y = b_0 + b_1 \text{age} + b_2 \text{sex} + b_3 \text{ms} + b_4 \text{edu} + b_5 \text{occ} + b_6 \text{inc} + b_7 \text{PdP} + b_8 \text{PrP} + b_9 \text{PlP} + b_{10} \text{PmP} + b_{11} \text{loc} + \mu$$

According to the general theory of consumers' purchasing towards products, the researcher expected the following findings as presented in Table 3.6.

Table 3.6 Expected signs of parameters of variables used in this study

| Variable | Expected Signal Parameter |
|---|---|
| Age | + |
| Sex | + / - |
| Marital status (MS) | + / - |
| Level of education (Edu) | + |
| Occupation (Occ) | + |
| Income (Inc) | + |
| Product perceptions (PdP) | + |
| Price perceptions (PrP) | + |
| Place perceptions (PlP) | + |
| Promotion perception (PmP) | + |
| Location (Loc) | + |

Table 3.6 shows the expected signs of variables used in this study with detailed explanation as follow:

The parameter $b_1$ of the variables age is expected to have positive sign. It means that if age of consumer increases their perception and consciousness of health increases also. Finally, it affects their purchases towards yogurt.

The parameter $b_2$ of the variables sex can be either positive or negative. It means that either female or male have same chance to purchase yogurt. However, mostly female is expected to be more interested to purchase yogurt than male.

The parameter $b_3$ of the variables marital status is expected to have a positive sign, meaning that marital status can be used as determining factor of market demand. However, single status has bigger chance to do anything and to have perceptions towards something compared with married status. In other words, single has higher decision to purchase towards many kinds of goods/services rather than married.

The parameter $b_4$ is expected to have a positive sign, meaning that by increasing the education level of consumers, their knowledge and decision to purchase on products/services are also increase.

The parameter of $b_5$ the variables occupation is expected to have a positive sign since occupation, level of education and level of income usually have strong relationship of each other.

The parameter $b_6$ is expected to have a positive sign since income is one of strong indicators of perceptions towards products/services. It means that by

increasing income level of consumers, their perceptions towards products/services increase.

The parameter $b_7$, $b_8$, $b_9$, $b_{10}$ are expected to have positive signs since these items are critically important in marketing strategy and also affect the consumers' perceptions towards yogurt. It means that perceptions of 4Ps are crucial parameters of consumers' consideration to have a purchase towards yogurt.

The sign of $b_{11}$ is expected to be positive, since the locations between urban and sub-urban are different from each other meaning that a consumer from urban areas have higher chance to purchase yogurt than a sub-urban consumer. In other words, it can be said that location and consumer's characteristic (i.e., age, level of education, level of income) are positively related with the decision to purchase yogurt.

### 2) Logistic regression analysis and estimation of the models

Binary logistic regression models are used in this study to estimate consumers' socio-economic characteristics and marketing mix of yogurt affecting their purchasing decision towards yogurt.

A binary logistic model specification is chosen for this study where the dependent variable are limited of two alternatives and is a simple "Yes = 1 / No = 0" questions, respondents either the consumers' who likely to purchase yogurt or not purchase, respectively. The vector of explanatory variables (X) includes factors such as socio-economic characteristics of respondents, frequency of consumption, and consumers' knowledge about yogurt (product knowledge). The vector of estimated coefficients, $\beta$, shows the impact of changes in (X) on the probability of (Y) (Greene, 2003). It can be written as follows:

DtP = f (Internal influences, external influences, location dummy)…….(5)

Where:

DtP is dependent variable representing consumers' decision to purchase towards yogurt (1 = consumers who likely to purchase yogurt and 0= consumers who unlikely to purchase yogurt).

Finally, estimating the impact of socio-economic characteristics and other factors on Malang consumers' decision to purchase yogurt, the following binary choices model was specified as follows:

$$Y = b_0 + b_1 \text{age} + b_2 \text{sex} + b_3 \text{ms} + b_4 \text{edu} + b_5 \text{occ} + b_6 \text{inc} + b_7 \text{PdP} + b_8 \text{PrP} + b_9 \text{PlP} + b_{10} \text{PmP} + b_{11} \text{loc} + \mu$$

**3) Model validity**

3.1) Choice of the appropriate econometric technique

The ordered and binary logistic models can be estimated using maximum likelihood estimation (Pindyck and Rubinfield, 1976). The data were transcribed and analyzed using a computer program for social science research.

3.2) Examination of the degree of correlation among the explanatory variables

Most economic variables are correlated, in the sense that they tend to change simultaneously during the various phases of economic activity (Koutsoyiannis, 1977). The explanatory variables such as age, marital status, level of education, type of occupation, level of income, and consumers' knowledge of product has affect/influence the consumers' perception and decision to purchase towards yogurt The degree of collinearity between variables can be examined and corrected, if necessary.

Degree of relationship is expressed as a correlation coefficient, which is computed based on the two sets of variables. If two variables are highly related, a correlation coefficient near +1.00 (or -1.00) is obtained; if two variables are not related (have no association between two variables) then a coefficient near 0.00 is obtained (Gay and Diehl, 1992). The higher the correlation coefficient, the stronger the level of association (Hair *et al.,* 2000). The correlation coefficient can be either positive or negative, depending on the direction of the relationship between the two variables (Hair *et al.*, 2000).

**3.9  Scope of the research**

The scopes of this study are as follows:

(1)    The areas of this survey were urban and sub-urban areas in Malang city, East Java Province, Indonesia.

(2)    Target group consists of consumer (buyers and non-buyers) who live in urban and sub-urban areas in Malang city, both female and male in age ranging from 15-60 years.

(3)    Time duration for conducting a survey was roughly two months, started in the middle of April 2011 until the middle of July 2011.

(4)    Two types of product used in this research are drinking yogurt and frozen yogurt

# CHAPTER 4
# Results and Discussions

This chapter presents results from the analysis and discussion from the research findings. The descriptive analysis includes socio-economic characteristic of the respondents both in urban and sub-urban areas who were purchasing and not purchasing yogurt, consumers' knowledge about yogurt and its benefits for consumers' health, marketing mix of yogurt, and key factors determining consumers' perceptions towards and decision to purchase yogurt. In addition, the results of ordered and binary logistic regression analysis are also presented.

## 4.1 General description of yogurt in Malang city

At present, yogurt becomes one of the famous fermentation food in the world. Many people consume yogurt to benefit their health. As it is known that yogurt has been identified as one of the functional foods that provides health benefits beyond basic nutrition to human health. Functional foods (i.e., foods containing probiotics, which claim to have a positive effect on health) have gained popularity and acceptance worldwide as a number of these products are available commercially, and the range of such products continues to expand (Yildiz, 2010).

Recently, consuming yogurt has becomes a trendy Indonesian life style. Many yogurt stores established since 2009 offer various types of yogurts, such as frozen yogurt ("froyo") and drinking yogurt. However, lately frozen yogurt is more popular than drinking yogurt especially in big cities in Indonesia. East Java Province is known as the largest milk-producer in Java Island with its contribution around 55.8 % of total national milk production (http://deptan.ditjenak.go.id accesses on July 29, 2011).

Moreover, Morey (2011) also stated that there were almost 500,000 Indonesia dairy cows producing about 9 0,000 tonnes of milk in 2010 with around 97% of all dairy cows (Indonesia's milk) are located in the three provinces of Java, namely East Java, Central Java and West Java, with East Java being the largest milk producer for around 57% of Indonesia's milk production.

Over the last of five years, East Java Province has shown the largest growth of dairy cow population and milk production increasing annually by an average of 14.60 and 24. 0%, respectively (Morey, 2011). In 2010, around 57% of the majority of Indonesia's dairy cows and 50% of milk production was located in five regencies in Java island with Malang city is the highest producer around 146,121 tonnes of milk (Morey, 2011). Further, Malang city is one of the biggest areas that have contributed to national milk production.

Regarding to yogurt stores in Malang city, data from the Department of Trade and Industry of Malang city (2010) revealed that the numbers of yogurt stores in Malang city increased significantly around 40% in 2011. This fact indicates that market demand of yogurt in Malang city tends to increase.

## 4.2 Socio-economic characteristics of the consumers

To obtain some background information of buyers and non-buyers of yogurt both in urban and sub-urban areas of Malang city, a comparison between those two groups was conducted. For this purpose, each sampled respondent was asked the question, "Have you ever bought and/or consumed yogurt before?". From that question, it can be used as filter to determine the buyers and non-buyers or people who purchase or not purchase yogurt.

The most important socio-economic characteristics of buyers and non-buyers of yogurt in Malang city were analyzed. The results provided information to marketing planners regarding factors that affect consumers' decision in purchasing or not purchasing yogurt.

### 4.2.1 Urban versus sub-urban consumer characteristics

The results of the socio-economic characteristics are as follow:

(1) Sex

As shown in Table 4.1, it revealed that the highest numbers of buyers in both areas which more than half of the sampled respondents were 69.02% female among buyers in urban and around 72.50% female in sub-urban areas. It indicated that female intended to buy yogurt (6 % among buyers) than male ( 7% among buyers) both in urban and sub-urban areas of Malang city.

A previous study conducted by Menrad and Sparke (2006) with their study about consumers' attitudes and expectations concerning functional foods in four European countries found that women were overrepresented among buyers with 59% (in Poland), 52.10% (in Spain), 66. 0% (in United Kingdom), and 68.20% among buyers in Germany.

This indicated that female consumers were more aware of their health than male counterpart. Most of them consumed yogurt in order to keep healthy and to control their diet.

(2)      Age of respondents

Another socio-economic characteristic that should be taken into account when studying about consumers' perceptions towards yogurt is their ages. In terms of consumers' age, it was spread in different ranges between 15-20 years old in urban with a mean age of 2  years, and 26- 0 years old in sub-urban with a mean age of 29 years old (Table 4.1). The majority of the respondents as high as 96.08% were below  5 years. If compared with the non-buyers, it was found that the highest number of ages of non-buyers in both urban and sub-urban areas was between 21-25 years. It was clear that teenagers dominated the market segment of yogurt in urban areas while sub-urban overrepresented by middle-aged female consumers. These findings are related to location of yogurt shops in urban area where they are mostly located surrounding academic institutions (colleges/universities). Therefore, the majority of the target markets are people in those age of range and mostly were students. A previous study conducted by Verbeke and Viaene (1998) found that younger consumers with age less than 25 years old dominated consumer behaviors towards yogurt in two regions of Belgium and Poland. The high percentage of younger people as yogurt consumers in urban areas was affected by changes in their lifestyle nowadays which are more aware of their own health.

The highest percentages of buyers in both areas of Malang city were consumers who were in the age ranging between 21-25 years (  5.50%), followed by  5% in the age ranging between 15-20 years.

( ) Marital status of respondents

Different value also occurred with marital status. More than half of the buyers in urban areas were single (80 %) while only 20% were married. In contrast to sub-urban areas, married consumers (57.50%) dominated the single consumers (42.50%). This was because most of the urban buyers were students who lived near surrounding universities/colleges, while the urban buyers were consumers who were workers and married as well. Overall, the majority of buyers in both areas of Malang city were single (68.25%).

Radam *et al.,* (2010) explained that it is important to categorize the respondents' marital status because of its influence on their purchasing decision towards yogurt with regards to frequency of purchasing.

(4) Education level and type of occupation of respondents

From Table 4.1, it reveals that there is a slight tendency in urban area that consumers with the academic education or with an academic degree had intention to purchase yogurt. With regard of educational level, more than half of the urban buyers (66.27%) were graduates from senior high schools and was still studying in universities; while the highest percentages of the buyers in sub-urban area were graduates from universities ( 2.50%).

This was in line with the location of yogurt stores that were mostly found in the surrounding areas of the universities/colleges, therefore the target customers mostly were students. In contrary for sub-urban consumers, the locations of yogurt stores were spread in residential and office areas, therefore most of the consumers were workers. This is the reason why the target market were not specifically targeted to educated people only. Generally, the majority of the consumers in Malang city were graduates from high school at 5 .75% of the total consumers.

Table 4.1  Socio-economic characteristics of respondents in urban and sub-urban areas of Malang city, East Java province, Indonesia

| Variables items | Urban | | | | | | Sub-urban | | | | | | Grand Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Buyers[1a] | | Non-buyers[1b] | | Total | | Buyers[2a] | | Non-buyers[2b] | | Total | | | |
| | n=255 | % | n=45 | % | n= 00 | % | n = 40 | % | n = 60 | % | n = 100 | % | n = 400 | % |
| **Sex** | | | | | | | | | | | | | | |
| - Male | 79 | 0.98 | 27 | 60.00 | 111 | 5. 4 | 11 | 27.50 | 26 | 4 . | 7 | 7.00 | 148 | 7.00 |
| - Female | 176 | 69.02 | 18 | 40.00 | 189 | 64.66 | 29 | 72.50 | 4 | 56.67 | 6 | 6 .00 | 252 | 6 .00 |
| **Age** | | | | | | | | | | | | | | |
| - 15-20 years | 115 | 45.10 | 10 | 22.22 | 125 | 41.67 | 6 | 15.00 | 9 | 15.00 | 15 | 15.00 | 140 | 5.00 |
| - 21-25 years | 98 | 8.4 | 18 | 40.00 | 116 | 8.67 | 8 | 20.00 | 18 | 0.00 | 26 | 26.00 | 142 | 5.50 |
| - 26- 0 years | 24 | 9.41 | | 6.66 | 27 | 9.00 | 11 | 27.50 | 11 | 18. | 22 | 22.00 | 49 | 12.25 |
| - 1- 5years | 9 | .5 | 5 | 11.11 | 14 | 4.67 | 7 | 17.50 | 8 | 1 . | 15 | 15.00 | 29 | 7.25 |
| - 6-40 years | 7 | . 2.75 | 4 | 8.88 | 11 | .67 | | 7.50 | 0 | 0.00 | | .00 | 14 | .50 |
| - More than 40 years | | 1.18 | 5 | 11.11 | 7 | 2. | 5 | 12.50 | 14 | 2 . 4 | 19 | 19.00 | 27 | 6.75 |
| | *Urban:* mean: 2 ; S.D.: 6.09; min: 15; max: 51 | | | | | | *Sub-urban:* mean: 29; S.D.: 9.05; min: 17; max: 47 | | | | | | | |
| **Marital Status:** | | | | | | | | | | | | | | |
| - Single | 204 | 80.00 | 28 | 62.22 | 2 2 | 77. | 17 | 42.5 | 24 | 40.00 | 41 | 41.00 | 27 | 68.25 |
| - Married | 51 | 20.00 | 17 | 7.78 | 68 | 22.67 | 2 | 57.5 | 6 | 60.00 | 59 | 59.00 | 127 | 1.75 |
| **Level of Education** years in school : | | | | | | | | | | | | | | |
| - 9 years | 14 | 5.50 | 0 | 0.00 | 14 | 4.67 | 5 | 12.50 | 12 | 20.00 | 27 | 27.00 | 41 | 10.25 |
| - 12 years | 169 | 66.27 | 22 | 48.89 | 191 | 6 .66 | 12 | 0.00 | 22 | 6.67 | 24 | 24.00 | 215 | 5 .75 |
| - 15 years | 22 | 8.6 | 5 | 11.11 | 27 | 9.00 | 10 | 25.00 | 16 | 26.67 | 26 | 26.00 | 5 | 1 .25 |
| - 16 years | 50 | 19.61 | 18 | 40.00 | 68 | 22.67 | 1 | 2.50 | 10 | 16.67 | 2 | 2 .00 | 91 | 22.75 |
| | *Urban:* mean: 1 .09 ; S.D.:1.99; min: 9; max: 16 | | | | | | *Sub-urban*: mean: 14. ; S.D.: 2.1; min: 9; max: 16 | | | | | | | |
| **Occupation** | | | | | | | | | | | | | | |
| - Student | 18 | 71.77 | 24 | 5 . 4 | 207 | 51.75 | 7 | 17.50 | 18 | 0.00 | 25 | 25.00 | 2 2 | 58.00 |
| - Public sector | 8 | .14 | | 6.67 | 11 | 2.75 | 10 | 25.00 | 10 | 16.67 | 20 | 20.00 | 1 | 7.75 |
| - Private sector | 5 | 1 .7 | 9 | 20.00 | 44 | 11.00 | 1 | 2.50 | 16 | 20.00 | 29 | 29.00 | 7 | 18.25 |
| - Self-employed | 24 | 9.41 | 5 | 11.11 | 29 | 7.25 | 6 | 15.00 | 10 | 16.67 | 16 | 16.00 | 45 | 11.25 |
| - Housewife | 5 | 1.96 | 4 | 8.88 | 9 | 2.25 | 4 | 10.00 | 6 | 10.00 | 10 | 10.00 | 19 | 4.75 |
| **Income** | | | | | | | | | | | | | | |
| - Less than or equal Rp. 500,000 | 25 | 9.80 | 4 | 8.88 | 29 | 9.67 | 4 | 10.00 | 9 | 15.00 | 1 | 1 .00 | 42 | 10.50 |
| - Rp. 500,001.- 1,000,000 | 140 | 54.90 | 17 | 7.77 | 157 | 52. | 8 | 20.00 | 10 | 16.67 | 18 | 18.00 | 175 | 4 .75 |
| - Rp. 1,000,001 – 1,500,000 | 8 | 14.90 | 11 | 24.44 | 49 | 16. | 8 | 20.00 | 11 | 18. | 19 | 19.00 | 68 | 17.00 |
| - Rp. 1,500,001 – 2,000,000 | 16 | 6.27 | | 6.66 | 19 | 6. | 7 | 17.50 | 18 | 0.00 | 25 | 25.00 | 44 | 11.00 |
| - Rp. 2,000,001 -.2,500,000 | 15 | 5.88 | 6 | 1 . 4 | 21 | 7.00 | 10 | 25.00 | 7 | 11.67 | 17 | 17.00 | 8 | 9.50 |
| - More than Rp. 2,500,001 | 21 | 8.24 | 5 | 11.11 | 25 | 8. 4 | | 7.50 | 5 | 8. | 8 | 8.00 | | 8.25 |

Regarding consumer's occupation, more than half of consumers' occupation in the urban areas were dominated by student (71.77%) followed by private sector officers (1 .7 %), self-employed people (9.41%), public sector officers (  .14%) and housewives (1.96%).

On the other hand, the majority of buyers in the sub-urban areas were led by private sector officers at   2.50%, followed by public sector/government officials (25%), students (17.50%), self-employed people (15%), and housewives (10%). The result showed that the least percentage of consumers who purchase yogurt in both urban and sub-urban areas was housewives.

Generally, the majority of the buyers in both areas were students at 58%. There was an evidence that consumers with further education after high school were more likely to purchase yogurt. It was due to their education level that influenced their product knowledge of yogurt. On the other hand, they were not having their own salary/income. Therefore, around 5  . 4 % among the non-buyers in urban and   0% among the non-buyers in sub-urban areas were also dominated by students.

5)      Income level of respondents

Level of income has an essential influence on consumer's consumption because it is a factor determining their purchasing power. Income is also an important variable to distinguish market segments. As shown in Table 4.1 it revealed that the highest number of urban consumers' income level was between IDR. 500,000-1,000,000 per month, while for sub-urban consumers, their income was ranged between IDR. 2,000,000-2,500,000 per month. That was due to their differences in occupations in both areas, where the urban were dominated by students while the sub-urban were dominated by private sector officers.

It can be explained in detail that more than half of the buyers in urban areas were students who did not have their own monthly salary but they got income from their parents so the decision to buy yogurt was highly influenced by their parents also their surrounding environment (their friends) or just for their own lifestyle.

Moreover, from the results shows that income level has significant difference with promotion of product and price in sub-urban areas (appendix E).

### 4.2.2 Buyers versus non-buyers

(1)    Purchasing and not purchasing

This part deals with the total number of buyers and non-buyers both in urban and sub-urban areas of Malang city. From the survey of 400 respondents in both urban and sub-urban areas, they were divided into 295 respondents for buyers (7 .75%) and 105 for non-buyers (26.25%). Within this the number of buyers and non-buyers of yogurt in Malang city are presented in Figure 4.1. It can be seen that the number of buyers in urban area were higher than non-buyers. In contrast, the number of non-buyers in sub-urban dominated the number of buyers. More than half of total respondents in urban (85%) were buyers and only 15 % were non-buyers, whereas the proportions of consumers in sub-urban was 40 % were buyers and 60% were non-buyers. It implied that yogurt tended to more popular in urban than sub-urban areas of Malang city. This caused/influenced some factors such as (1) the deployment location of yogurt selling and the number of s yogurt shops in sub-urban were limited as compared to the urban areas, (2) the access of information and knowledge of the urban consumers was higher than those of the sub-urban areas.
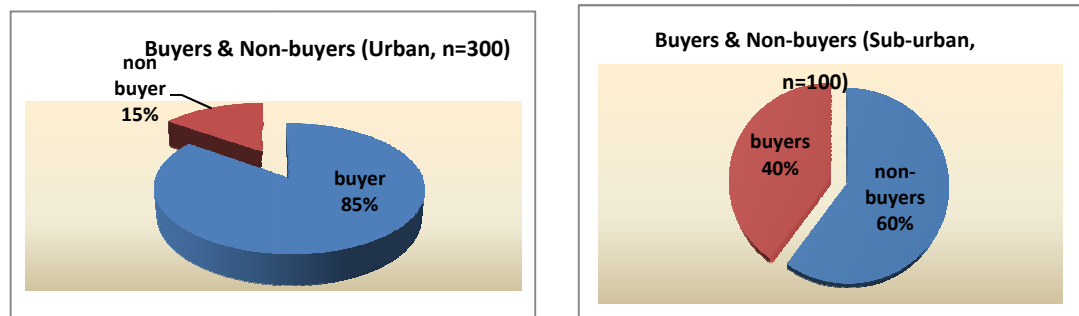


sub-urban areas

(2)    Yogurt consumption frequency and length of consumption of yogurt for buyers

Consumers who declared themselves as buyers of yogurt were asked to rate how often they bought yogurt. It can be seen from Table 4.2 that the highest frequency of yogurt consumption in the urban areas was 2-  times or more per week (26.67%). Followed by the number of consumers who consumed yogurt at least once in a month (2 .5 %). While around 21.96% of consumers used to consume it at least

once a week, and around 14.12% consumed yogurt once in two weeks. Nearly 1 .7 % of the consumers consumed yogurt once in more than two months. This data indicated that yogurt was consumed periodically and lately became like habits or lifestyle for Indonesian consumers, especially in Malang city areas.

The highest number of yogurt consumption in the sub-urban areas was at least once in two weeks ( 7.50%), followed by once a week ( 2.50%), at least once a month (20%), and a small number of 2- times per week (10%).

In general, the research study found that Malang urban consumers had higher frequency (2- times per week or more) than the sub-urban buyers who consumed at least once in two weeks. The majority of yogurt consumption frequency in both areas ranged between 2- times per week or more (24.41%) and at least once in a week (2 . 9%).

Table 4.2 Frequency of yogurt consumption in both urban and sub-urban areas of Malang city, East Java province, Indonesia

| Characteristics | Urban | | Sub-urban | | Total | |
|---|---|---|---|---|---|---|
| | n = 255 | % | n = 40 | % | n = 295 | % |
| **Type of consumer:** | | | | | | |
| - Buyers | 255 | 85.00 | 40 | 40.00 | 295 | 74.00 |
| - Non-buyers | 45 | 15.00 | 60 | 60.00 | 105 | 26.00 |
| **Frequency of consumption** | | | | | | |
| - 2- times per week/more often | 68 | 26.67 | 4 | 10.00 | 72 | 24.41 |
| - once per week | 56 | 21.96 | 1 | 2.50 | 69 | 2 . 9 |
| - once in two weeks | 6 | 14.12 | 15 | 7.50 | 51 | 17.29 |
| - once a month | 60 | 2 .5 | 8 | 20.00 | 68 | 2 .05 |
| - once in more than two months | 5 | 1 .7 | 0 | 0.00 | 5 | 11.86 |
| **Length of consumption** | | | | | | |
| - More than 2 years | 20 | 7.84 | 0 | 0.00 | 20 | 6.78 |
| - Between 1-2 years | 74 | 29.02 | 14 | 5.00 | 88 | 29.8 |
| - Between 6.5-11.5 months | 62 | 24. 1 | 6 | 15.00 | 68 | 2 .05 |
| - Between 2.5-6 months | 57 | 22. 5 | 16 | 40.00 | 7 | 24.75 |
| - Between 1-2 months | 42 | 16.47 | 1 | 2.50 | 55 | 18.64 |

In terms of length of yogurt consumption, most of the urban consumers had consumed yogurt for around 1-2 years (29.02%), followed by the consumers in the range of 6.5-11.5 months (24. 1%). Nearly 22. 5% had consumed yogurt for 2.5-6 months, while around 16.47% stated that they just started to consume for 1-2 months. The longest period of consuming yogurt was for more than 2 years at 7.84% of the urban buyers.

In contrast, the percentages of sub-urban consumers who consumed yogurt for 1-2 years ( 5%), which were lower than the number of consumers who consumes yogurt for 2.5-6 months (40%). Around  2.50% of the consumers mentioned that they just started to consume yogurt for 1-2 months, while 15 % had consumed it for 6.5-12 months. No one said that they had consumed it for more than 2 years. It means that the urban consumers have longer period of yogurt consumption than the sub-urban consumers.

In general, it can be stated that mostly the consumers in both areas of Malang City had consumed yogurt for 1-2 years (29.8  %), and in the range between 2.5-6 months (24.75%).

( )    Family influences

Family is defined as two or more persons related to blood, marriage, or adoption who reside together (Schiffman and Kanuk, 2007)**.** Family is one of the key factors influencing consumer behaviors. From the result of the survey (Table 4.  ), it revealed that family members of consumers participated to consume yogurt. The highest number of respondents in both areas mentioned that their family (i.e., brothers/sisters) contributed to the consumption of yogurt as 4 .14% in the urban areas and around  2.50% in the sub-urban areas indicated the  influences in the decision making to purchase yogurt. Around  2.55% of respondents in the urban areas said that all their family consumed yogurt, while 4. 0% explained that none of their family consumed it.

Similarly, in the sub-urban areas where the consumers indicated that family either parents or siblings played roles in making decision to purchase and/or consume yogurt. Around 22.50% of the respondents mentioned that their parents consumed yogurt, followed by their family members (20%), a small number of couples (12.50%), and none of their family (12.50%).

Table 4.    Family members who participated in yogurt consumption in Malang city, East Java province, Indonesia

| No. | Family members* | Urban | | Sub-urban | | Total | |
|---|---|---|---|---|---|---|---|
| | | n = 255 | % | n = 40 | % | n = 295 | % |
| 1 | All family | 8 | 2.55 | 8 | 20.00 | 92 | 2 .00 |
| 2 | Mother/father | 18 | 7.06 | 9 | 22.50 | 27 | 6.75 |
| | Brother/sister | 110 | 4 .14 | 1 | 2.50 | 12 | 0.75 |
| 4 | Couple (husband/wife) and kids | | 12.94 | 5 | 12.50 | 8 | 9.50 |
| 5 | None of their families member consumes | 11 | 4. 0 | 5 | 12.50 | 16 | 4.00 |

Remark: * This part of question is for buyers only

(4)    Information sources on yogurt

Source of information was one of the important factors influencing consumer's perceptions and their decision to purchase. Besides, information is a primary tool which the marketer applies in an attempt to influence consumers. Kohli (1997) and Vranesevic and Stancec (200 ) argued that food was rarely eaten without any information.

Table 4.4    Information sources on yogurt in urban and sub-urban areas of Malang City, East Java province, Indonesia

| No. | Sources of Information* | Urban | | Sub-urban | | Total | |
|---|---|---|---|---|---|---|---|
| | | n =255 | % | n = 40 | % | n = 295 | % |
| 1 | Television/internet advertisement | 114 | 44.71 | 24 | 60.00 | 165 | 41.25 |
| 2 | News on TV/internet | 67 | 26.27 | 5 | 12.50 | 72 | 18.00 |
| | Product description/label description | 48 | 18.82 | 9 | 22.50 | 57 | 14.25 |
| 4 | Family or relatives | 8 | 14.90 | 15 | 7.50 | 5 | 1 .25 |
| 5 | Friend | 58 | 22.75 | 12 | 0.00 | 70 | 17.50 |
| 6 | Scientific journals or articles or books or magazines | 8 | 14.90 | 0 | 0.00 | 8 | 9.50 |
| 7 | Doctor/pharmacies/nutritionist suggestion | 10 | .92 | | 7.50 | 1 | .25 |
| 8 | Mall testing/mall promotion | | 1.18 | 0 | 0.00 | | 0.75 |

Remark: *For buyers only: urban (B=255, NB=45); sub-urban (B=40, NB=60)

The results as shown in Table 4.4 revealed that sources of information in the urban areas were frequently mentioned the most was television or internet (4.71%) while 26.27% from news in television or internet. Similarly, in the sub-urban areas, the highest number of information sources was television or internet advertisement (60%) and around 12.50% found it from news in television or internet. In this case, it is believe that advertisement is a crucial factor to deliver knowledge and promotion of the yogurt. This is in line with the findings carried out by Lappalainen *et al.* (2008) that mass media, in particular internet, became the major sources of health information in the Northern European countries.

This findings showed that television or internet advertisement was the most influential medias/sources on purchasing yogurt both in the urban and sub-urban areas. This indicated that public media is one of the best way to make a product promotion. At present internet sites (web sites) are used as ways of online marketing for clothing and accessories, as well as many household and family needs (Schiffman and Kanuk, 2006). Therefore, it is much easier for consumers to access a variety of information or search products/services that they want in this present.

Information from friend and family recommendation has power to influence consumers to purchase yogurt both in the urban and sub-urban areas. The findings showed that other important information sources on yogurt of urban consumers were from friends (22.75%) and family/relatives (14.90%). In addition, the influences from family and friend had a substantial role in delivering information to the sub-urban consumers in terms of product knowledge which was around 7.50% and 0% respectively.

Schiffman and Kanuk (2007) argued that family, friends and social classes were the major societal groupings that influenced an individual consumer's attitudes and behaviors. In terms of relatives influence, friends are more likely to influence the individual's purchase decisions after the family (Schiffman and Kanuk, 2007).

The description on the product package/label description has a contribution to provide consumers with knowledge/information about yogurt as 18.82% of the urban consumers and 22.50% of the sub-urban consumers had roles/contribution to persuade the consumers on purchasing yogurt.

The product information/description in the label assessed in this study showed that there was not significantly different in both the urban and sub-urban areas of Malang city. This might be due to most of the yogurt types in the urban areas were home-made yogurts that did not attach label packages of information. However, the sub-urban consumers preferred to consume factory-made yogurts than home-made yogurts. This result was consistent with Visschers and Siegrist (2009) who informed that types of nutrition table in yogurt did not influence (not significantly) respondents' perceptions of yogurt.

However, another finding found by Pohjanheimo and Sandell (2009) informed that the product information (i.e., manufacture's name, brand name, flavor and picture of the commercial package) had a significant and positive effect on Finnish yogurts' mean hedonic scores (p < 0.001). Visschers and Siegrist (2009) also reported that nutrition information in the form of a table on their package had a significant influence on respondents' attractiveness rating of chocolate $F(5,14) = .97$ with $p = 0.02$. They stated that reference information helped consumers to understand the product more and to make informed decision about which foods they choose to eat.

Moreover, journals, books and/or magazines are types of mass media that rarely used for consumers in general, only in a specific use of yogurt information. About 14.90% of the urban consumers stated that they received information from articles in journals, books and/or magazines, while no one of the sub-urban consumers mentioned it.

Another information sources were from doctors, pharmacies or nutritionist at .92% of the urban consumers and 7.50% of the sub-urban consumers. These types of media were less popular than the former one. It is due to those media intended for a certain consumer segment who mostly live in urban areas and have high access of the media. The smallest percentage of the source of yogurt information was mall testing. Only 1.18% of the urban consumers received information about yogurt from the mall testing and no one of the sub-urban consumers had that experiences.

### 4.2.3 Reasons for purchasing and not purchasing

Purchasing behavior is the decision process and act of the people involved in purchasing and using products or services. There were two types of yogurt in this present study (see Figure 4.2), namely drinking yogurt and frozen yogurt. Based on the results, nearly 5 .67% of the sub-urban consumers preferred drinking yogurt to frozen yogurt at 1. 4%. Similarly, 75% of the urban consumers tended to choose drinking yogurt than frozen yogurt (25%).
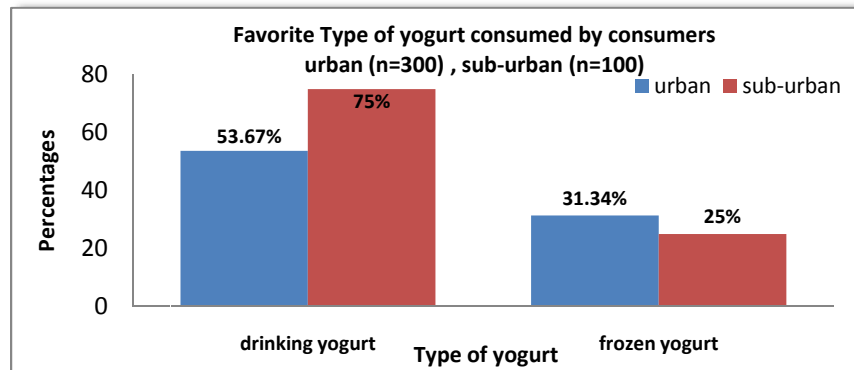
Figure 4.2 Favorite types of yogurt consumed by buyers in urban and sub-urban areas of Malang city, East Java province, Indonesia

(1) Purchasing reasons

The respondents who are buyers were asked about their motives (reasons) behind purchasing yogurt. There were some purchasing reasons as shown in Table 4.5. The most stated reason to purchase yogurt in both areas was to keep healthy approximately 7 . 4% of the urban consumers and around 80% in the sub-urban areas. Most of the consumers believed that yogurt maintained their health. Johansen *et al.* (2011) stated that health information and perception were crucial to consumers' ability to make informed food choices. Additionally, he also informed that nutritional information was expected to influence consumer perceptions and acceptance of health-improved foods. Diplock *et al.* (1999) cited by Messina *et al.,* (2008) stated that the specific ingredients in functional food (i.e., probiotic) which were likely to deliver health benefits was now generally more accepted by consumers.

Diet option was another reason why the consumers purchased yogurt (2 .5 % in the urban and 22.50% in the sub-urban areas). Mostly, they used to drink yogurt in order to have their ideal body weight. Previous studies conducted by Oakes and Slotterback (2002) and Carel *et al*. (2007) showed that food choice motives related to improve health or to lose weight tended to influence their perceptions.

Johansen *et al*. (2011) on their research study with a title "Motivation for choice and healthiness perception of calorie-reduced dairy products" reported that there were three most important motivators for choice of the calorie-reduced

dairy products, namely fat content, healthiness and taste, which yogurt ranked as healthier than cheese. In a study by Siegrist *et al.* (2008) cited by Visschers and Siegrist (2009), respondents were asked to classify foods with various nutritional levels as healthy and unhealthy. The results showed that more respondents associated yogurt with healthy rather than unhealthy. Jonas and Beckmann (1998) clarified that health was mentioned as one reason for England consumers in choosing functional foods such as yogurt, cereal and butter. According to a large EU study (Lappalainen *et al.*, 1998), healthiness was one of the most important food choice factors mentioned by European consumers. Health is also linked with safety when purchasing organic food (Zanoli and Naspetti, 2002). The same findings conducted by Messina *et al.* (2008) informed that the most important constructs for older people in Northern European countries associated with functional yogurt were related to health benefits. These previous studies are in line with the results of the consumers in both areas of Malang city that the most cited reason for purchasing/consuming yogurt was to keep healthy.

Around 5.49% of the urban consumers and 12.50% of the sub-urban consumers stated that they purchased yogurt for therapy, whereas as much as 6.67% in the urban and 10% in the sub-urban areas mentioned that they consumed yogurt to slow aging process. It was in line with the findings that more than half of sampled respondents were dominated by female, who gave more care/awareness about their health performances.

Only .92% of the urban consumers and 2.50% of the sub-urban consumers mentioned that they purchased yogurt because of doctor recommendation. In this study, doctor suggestion/advises to purchase yogurt was rare.

Other important reason why the respondents bought yogurt was its good taste. In this study, taste was one of the popular consumers' reason with regards to purchasing yogurt. Around 52.94% of the urban consumers and 42.50% of the sub-urban consumers mentioned that they liked the taste of yogurt. In the specific case of functional foods, taste was reported as a strong influential variable (Poulsen, 1999). In a study of Tepper and Trail (1998), consumers preferred taste and sensory quality to the healthiness of corn chips. In several studies, taste has

been the most important choice factor in consumers' mind/consumers' perception (Urala and Lahteenmaki, 200 ). Further, they also argued that taste led to general well beings of yogurt (Urala and Lahteenmaki, 200 ). A previous study of "Reasons behind consumers' functional food choices" was conducted by Urala and Lahteenmaki (200 ) who informed that taste and sensory quality was one of the reasons mentioned the most for choosing yogurt, ice cream, juice and sweets. The same finding from Shepherd and Farleigh (1986) cited by Urala and Lahteenmaki (200 ) recognized that better taste was a more important motivator for consumers than any possible health risks as a consequence of adding salt to a meal. Messina *et al.* (2008) in their research about "Older people's perceptions towards conventional and functional yogurt through the repertory grid method: a cross country-study" explained that reasons for choice associated with the two conventional yogurt (fruit creamy and plain creamy) were familiarization with the product and their likings of the product.

The majority of respondents in both areas indicated that yogurt was good for their health (74.24%) and for diet purposes (2 . 9%). Besides, it also has a good taste (51.5 %).

Table 4.5   Purchasing reasons of yogurt in urban and sub-urban areas of Malang city, East Java province, Indonesia

| No. | Reasons to purchase* | Urban | | Sub-urban | | Total | |
|---|---|---|---|---|---|---|---|
| | | n = 255 | % | n = 40 | % | n = 295 | % |
| 1 | To stay healthy | 187 | 7 . 4 | 2 | 80.00 | 219 | 74.24 |
| 2 | For diet | 60 | 2 .5 | 9 | 22.50 | 69 | 2 . 9 |
| | For  particular treatment or therapy | 14 | 5.49 | 5 | 12.50 | 19 | 6.44 |
| 4 | To retard aging | 17 | 6.67 | 4 | 10.00 | 21 | 7.12 |
| 5 | Doctor/ nutritionist recommendation | 10 | .92 | 1 | 2.50 | 11 | .7 |
| 6 | Good taste | 1 5 | 52.94 | 17 | 42.50 | 152 | 51.5 |

Remark: *This part of question for buyers only

(2)  Not purchasing reasons

The respondents who declared themselves as non-buyers were asked about their reasons for not purchasing yogurt. The main reason given by these non-buyers of yogurt in the urban areas was price (40%) (Table 4.6). They stated that the price of yogurt was relatively expensive. For instance, if it is compared to fresh

milk, a cup of yogurt (Rp. 6,000) is equal to 1 liter of fresh milk (Rp. 6,000/liter). Therefore, a cup of yogurt is around Rp. 6,000-20,000 or more. It means that the price of yogurt is almost  -4 times higher than fresh milk. Therefore, nearly 1 . 4% of 45 urban consumers mentioned that they preferred to consume milk or fresh milk to yogurt. As can be seen in Figure 4.2, the reason why the preference of Malang consumers to drink yogurt than frozen yogurt was owing to its price. The price of a cup of frozen yogurt was almost double or up to triple more than drinking yogurt. In this present study, a cup/glass of drinking yogurt was around Rp. 5,000-6,000, whereas for frozen yogurt was around Rp. 12,000-25,000. Therefore, the general consumers in Malang city tended to purchase the cheaper form of yogurt. The same case occurred in the sub-urban areas that drinking yogurt ( 0%) were more favorite to consume than frozen yogurt (10%).

The other reasons for the urban consumers not purchasing yogurt were uncommon or unfamiliar product and/or never heard about this product before (28.89%). The dislike flavor of yogurt (15.55%) became another reason that the non-buyers in the urban areas refused to purchase yogurt. Only 2.22% mentioned that yogurt was not effective to maintain the healthy body. Therefore, information about yogurt should be made available and accessible for consumers in order to improve their general perceptions about yogurt.

On the other side, the highest reasons why the non-buyers in the sub-urban areas did not purchase yogurt was because of unfamiliar product or never heard about yogurt before (71.67%). Dissemination of yogurt information should be more enhanced in order to provide a positive knowledge to consumers and improve market conditions of yogurt. Price became the second highest reason (10%) for the sub-urban consumers to make purchasing decision towards yogurt. They thought that yogurt was relatively expensive compared with fresh milk, therefore around 11.67% mentioned that they preferred to consume fresh milk than yogurt. Approximately 6.67% said that they did not want to purchase yogurt because of its tastes.

Another reason why consumers refuse to consume yogurt was its taste. The findings revealed that around 15.55% of the urban non-buyers and 6.67% of the sub-urban non-buyers mentioned that they did not like the taste of yogurt.

Verbeke and Viaene (1998) reported that taste also could be a main reason given by non-buyers of yogurt to not purchase yogurt or a dislike of dairy products in general. Some of the non-buyers said they did not like the original flavors of yogurt because it was too sour. Therefore, many company make some flavors modification with a variety of fruit flavors and reduces the level of the acidity. Barnes *et al.* (1991) and Harper *et al.* (1991b) reported that overall liking of yogurt was strongly related to sweetness intensity and increased with the sweetness in a linear manner. Therefore, on the basis of their results, Barnes *et al.* 1991a, advised dairy manufacturers to make flavored yogurt products sweeter rather than too sour, in order to ensure a high overall liking. The result of the present study showed that the variation or completeness of yogurt flavors had a significant difference at 0.09 ($P < 0.1$) between the urban and sub-urban areas.

The main reason for the majority of the non-buyers in Malang City (5 . %) for unlikely to purchase yogurt because of its unfamiliarity, its expensiveness (2.86%), and its unfavorable taste (10.48%).

Table 4.6 Reasons for not purchasing yogurt in urban and sub-urban areas of Malang city, East Java province, Indonesia

| No. | Reasons to refuse yogurt* | Urban | | Sub-urban | | Total | |
|---|---|---|---|---|---|---|---|
| | | n = 45 | % | n = 60 | % | n = 105 | % |
| 1 | Too expensive | 18 | 40.00 | 6 | 10.00 | 24 | 22.86 |
| 2 | Not effective | 1 | 2.22 | 0 | 0.00 | 1 | 0.95 |
| | Bad taste (do not like the taste of yogurt) | 7 | 15.55 | 4 | 6.67 | 11 | 10.48 |
| 4 | This product not common or unfamiliar (Never heard yogurt before) | 1 | 28.89 | 4 | 71.67 | 56 | 5 . |
| 5 | I prefer drink milk or fresh milk than yogurt | 6 | 1 . 4 | 7 | 11.67 | 1 | 12. 8 |

Remark: * This part of question is for non-buyers only

( ) Conditions that non-buyers want to purchase yogurt

After analyzing the reasons of the non-buyers not to purchase yogurt, identification of conditions that the non-buyers are willing to change their perceptions and behaviors is crucial. The question related to the conditions that consumers are willing to change their behaviors from "not purchase" to "purchase" yogurt aim to develop marketing strategies to expand potential demand for yogurt especially in Malang city either in both the urban or sub-urban areas. As shown in Table 4.7, around 46.67% of the urban consumers were willing to purchase yogurt if the prices of yogurt were lower, while 17.78% stated that taste become one reason

that they were unlikely to purchase yogurt. The medical doctor or nutritionist recommendation was another condition as 1 . 4% of the respondents mentioned it. Family or relative suggestion or recommendation (8.88%) also had a role to persuade the consumers to make decision to purchase yogurt. Around 6.67% of the respondents mentioned they were willing to purchase yogurt if they had problem with their health (i.e., digestion problem) and there were clear evidence about the benefits of the products (2.22%).

Similarly, more than half of the non-buyers (5 . 4%) in the sub-urban areas stated that they considered purchasing yogurt if it had lower prices. Price is the most important criterion in the marketing of a product. Around 15% mentioned that they were willing to purchase yogurt if there were any recommendation or suggestion from their family/friends, or if there was a recommendation from doctors or nutritionists (10%). Another conditions was its taste (6.67%), the digestion problem (6.67%), and clears evidence of the benefits of the products itself ( . 4%).

Table 4.7 Conditions for non-buyers to consider purchasing yogurt

| No. | Reasons for not purchase to purchase* | Urban | | Sub-urban | | Total | |
|---|---|---|---|---|---|---|---|
| | | n = 45 | % | n = 60 | % | n=105 | % |
| 1 | If recommended by medical doctor or nutritionist consultant | 6 | 1 . 4 | 6 | 10.00 | 11 | 10.48 |
| 2 | If it has lower prices | 21 | 46.67 | 2 | 5 . 4 | 5 | 50.48 |
| | If recommended by friends or relatives | 4 | 8.88 | 9 | 15.00 | 12 | 11.4 |
| 4 | Occurrence of health problems | | 6.67 | 4 | 6.67 | 5 | 4.76 |
| 5 | Disposition of specific diseases (i.e., digestion problem) | 2 | 4.45 | | 5.00 | 5 | 4.76 |
| 6 | Clear evidence of efficacy of such products | 1 | 2.22 | 2 | . 4 | | 2.86 |
| 7 | If it has a good taste (tasty) and/or smell | 8 | 17.78 | 4 | 6.67 | 11 | 10.48 |

Remark: * This part of question is for non-buyers only

## 4.3   Consumers' knowledge of yogurt  product knowledge

There were questions in the second part of the questionnaire concerning about consumers' knowledge of brand of yogurt, taste/flavor that were most favoured and unfavoured, and the benefits of consuming yogurt. Beyond affecting how a decision was made, consumers' knowledge might also determine the final decision itself (Moorman *et al.,* 2004).

### 4.3.1                                                    Taste of yogurt

The findings show that there were as many as 18 varieties of flavors of yogurt mentioned by the buyers in both the urban and sub-urban areas (Table 4.8).

However, it can be seen that more variety of flavors found in the urban than sub-urban areas. This may be due to more number of yogurt shops in the urban areas than in the sub-urban areas and mostly they were in the center of the city. This was also in line with the survey conducted in the urban areas. In the sub-urban areas yogurt was sold in general shops or small supermarket, namely Indomaret, which sold many things not specific only yogurt. There were some differences that in specific yogurt shops it can be ensured that consumers who came there definitely were yogurt consumers, while in the sub-urban areas it could not be guaranteed that consumers who came to Indomaret intended to purchase yogurt.

In terms of flavors, strawberry was the most favorite taste of the urban consumers (24. 0%), followed by original/plain (15.70%). This consumer preference was in accordance with the criteria of the urban buyers who mostly were teenagers with age ranging between 15-20 years, and were mostly student.

In contrast, plain/original (16%) was placed as the first place for the sub-urban consumers and lychee (15%) in the second options. This is suitable with the characteristic of the sub-urban buyers who were worked as workers and married with age ranging between 25-  0 years.

Plain/original flavors were not only one of the favorite flavors in the urban areas, but also became one of the most dislike flavors (1 .70%). Approximately 6% of the buyers mentioned that they did not like some flavors such as vanilla, melon, and pineapple. Meanwhile, 5% mentioned that chocolate and grape flavors were the most disliked flavors, whereas 4.7% said that strawberry and orange flavors were not suitable for their tastes,  . 0% tended to dislike of apple flavor, 2.70% stated that they dislike blueberry flavor, and the remains 8. 0% reported that there had some others disliked flavors such as lychee, mocca, banana, mango and durian.

Similarly, plain also became the most disliked flavor in the sub-urban areas (9%). Therefore, yogurt producers should try to modify with varieties of flavors in order to decrease the level of acidity and reduce specific smell. Furthermore, vanilla is also become one of the disliked flavors for the sub-urban consumers (9%). The other disliked flavors were chocolate, blueberry, durian, grape, and apple at a total of 14%.

Table 4.8 Preferences of yogurt flavors both in urban and sub-urban areas of Malang
city, East Java province, Indonesia

| No. | Taste of yogurt | Favorite flavor | | | | | | Dislike flavor | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Urban | | Sub-urban | | Total | | Urban | | Sub-urban | | Total | |
| | | n=255 | % | n=40 | % | n=295 | % | n=255 | % | n=40 | % | n=295 | % |
| 1 | Plain/original | 47 | 18.4 | 16 | 40 | 6 | 21. 6 | 41 | 16.08 | 9 | 22.5 | 50 | 1 .56 |
| 2 | Strawberry | 7 | 28.6 | 7 | 17.5 | 80 | 27.12 | 14 | 5.49 | 0 | 0 | 16 | 4.75 |
| | Lychee | 5 | 1 .7 | 15 | 7.5 | 50 | 16.95 | 7 | 2.75 | 0 | 0 | 7 | 2. 7 |
| 4 | Chocolate | 10 | .92 | 0 | 0 | 10 | . 9 | 15 | 5.88 | 5 | 12.5 | 21 | 7.12 |
| 5 | Grape | 18 | 7.06 | 2 | 5 | 20 | 6.78 | 15 | 5.88 | 2 | 5 | 17 | 5.76 |
| 6 | Orange | 11 | 4. 1 | 0 | 0 | 11 | .7 | 14 | 5.49 | 0 | 0 | 14 | 4.75 |
| 7 | Blueberry | 14 | 5.49 | 0 | 0 | 14 | 4.75 | 8 | .14 | 4 | 10 | 12 | 4.07 |
| 8 | Mocca | 1 | 0. 9 | 0 | 0 | 1 | 0. 4 | 5 | 1.96 | 0 | 0 | 5 | 1.69 |
| 9 | Vanilla | 9 | .5 | 0 | 0 | 9 | .05 | 18 | 7.05 | 8 | 20 | 26 | 8.81 |
| 10 | Melon | 11 | 4. 1 | 0 | 0 | 11 | .7 | 18 | 7.05 | 8 | 20 | 26 | 8.81 |
| 11 | Mango | 9 | .5 | 0 | 0 | 9 | .05 | 4 | 1.57 | 0 | 0 | 4 | 1. 6 |
| 12 | Kiwi | 1 | 0. 9 | 0 | 0 | 1 | 0. 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | Durian | 1 | 0. 9 | 0 | 0 | 1 | 0. 4 | 4 | 1.57 | | 7.5 | 7 | 2. 7 |
| 14 | Blackcurrant | 2 | 0.78 | 0 | 0 | 2 | 0.68 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | Apple | | 1.18 | 0 | 0 | | 1.02 | 10 | .92 | 1 | 2.5 | 11 | .7 |
| 16 | Pineapple | 1 | 0. 9 | 0 | 0 | 1 | 0. 4 | 18 | 7.05 | 0 | 0 | 15 | 5.08 |
| 17 | Banana | 1 | 0. 9 | 0 | 0 | 1 | 0. 4 | 5 | 1.96 | 0 | 0 | 5 | 1.69 |
| 18 | None | 1 | 0. 9 | 0 | 0 | 1 | 0. 4 | 42 | 16.47 | 0 | 0 | 42 | 14.24 |
| 19 | All taste (fruity) | 7 | 2.75 | 0 | 0 | 7 | 2. 7 | 0 | 0 | 0 | 0 | 0 | 0 |

Remark: * This part of question is for buyers only

### 4.3.2 Brand of yogurt

On the other hand, when the consumers were asked about brand of yogurt that they had ever heard or known, 11 different brand types were mentioned by the urban consumers, while 8 different types of brands were mentioned by the sub-urban consumers. The differences was due to differing conditions of yogurt shops characteristic in both areas. In the urban areas, there were many specialized yogurt shops such as Yoguchi, My yogurt, Super cow yogurt, Yogen früz, and Soursally (for soursally only exists in big cities i.e., Surabaya) that focus only on selling yogurt. In the sub-urban areas there were no specialized yogurt shops. However, this gap can be minimized by Indomaret stores where it sells factory-made yogurt with different brands such as Activia, Biokul, Chimory, Nice yogurt and Milkuat yogurt (danone).

From the findings, it can be seen that Yakult had became one of the famous brands, mostly for the urban consumers (20. 9%) due to its position as a market leader/a pioneer in Indonesia a long time ago. Therefore, the product brand was very well known (familiar) by Indonesians. A previous study carried out by Messina *et al.,* (2008) informed that two types of reasons underlying products

preferences particularly in functional and conventional yogurt were product knowledge and familiarity with that product or its brand. According to Morey (2011), there are over  0 companies involved in milk processing in Indonesia producing over 870,000 tonnes of milk products in 2009 with five companies involved in yogurt producing, such as Yakult, Danone, Cimory, Yummy, and Diamond. The leading player in yogurt market in Indonesia is Group Danone (www.researchandmarkets.com, 2011)

Further, "Activia" was the second most familiar brand of factory-made yogurt in the urban areas (16.08%) and being the most popular brand in the sub-urban (50%) areas (Table 4.9). The others popular brand for the urban consumers such as "My yogurt" was mentioned by 17.25%, "Yoguchi" (10%), "Chimory" (10.59%), "Super Cow Yogurt" (7.45%) and home-made "Yogurt Suhat" (8.24%). 4.50% remaining from the urban buyers who had varying opinions.

Table 4.9 Consumer's knowledge of yogurt brand names in urban and sub-urban areas of Malang city, East Java province, Indonesia

| No. | Name of brand* | Urban | | Sub-urban | | Total | |
|---|---|---|---|---|---|---|---|
| | | n = 255 | % | n = 40 | % | n = 295 | % |
| 1 | Activia | 41 | 16.08 | 20 | 50.00 | 61 | 20.68 |
| 2 | Biokul | | 1.18 | 4 | 10.00 | 6 | 2.0 |
| | Chimory | 27 | 10.59 | 2 | 5.00 | 29 | 9.8 |
| 4 | My yogurt | 44 | 17.25 | 0 | 0.00 | 44 | 14.92 |
| 5 | Milkuat yogurt | 4 | 1.57 | 4 | 10.00 | 8 | 2.71 |
| 6 | Soursally | | 1.18 | 0 | 0.00 | | 1.02 |
| 7 | Yoguchi | 0 | 11.76 | 2 | 5.00 | 2 | 10.85 |
| 8 | Yogurt Suhat | 21 | 8.24 | 0 | 0.00 | 21 | 8.24 |
| 9 | Supercow yogurt | 19 | 7.45 | 0 | 0.00 | 19 | 6.44 |
| 10 | Yakult | 52 | 20. 9 | 2 | 5.00 | 54 | 18. 0 |
| 11 | Nice yogurt | 5 | 1.96 | | 7.50 | 8 | 2.71 |
| 12 | Vitacharm | 2 | 0.78 | | 7.50 | 5 | 1.69 |
| 1 | Yogen früz | 4 | 1.57 | 0 | 0.00 | 4 | 1. 6 |

Remark: *This part of question is for buyers only: urban

In contrast to the urban areas, there were less percentages of different brand types of yogurt in the sub-urban areas. The highest number of brands consumed by these consumers was Activia (50%), followed by other popular brands such as Biokul (10%), Milkuat yogurt (10%), Nice yogurt (7.50%), Vitacharm (7.50%), Yakult (5%), and Chimory (5%). Due to lack of the number of specialized yogurt shops in the sub-urban areas, the consumers preferred to consume these types

of factory-made yogurt than home-made yogurt. The percentage of each brand and distributions of all types brands in both the urban and sub-urban areas are shown in the following Table 4.9

Furthermore, regarding to consumers' knowledge on benefits/ advantages of yogurt, around 80.67% of total the 00 respondents in the urban area stated that they knew about the benefits of yogurt, while the remaining 1 % did not know. In contrary, the highest percentage in the sub-urban areas was the consumers who did not know about the advantages/benefits of yogurt (79%) whereas only 21% indicated their knowledge about the benefits of yogurt (see Figure 4. ).
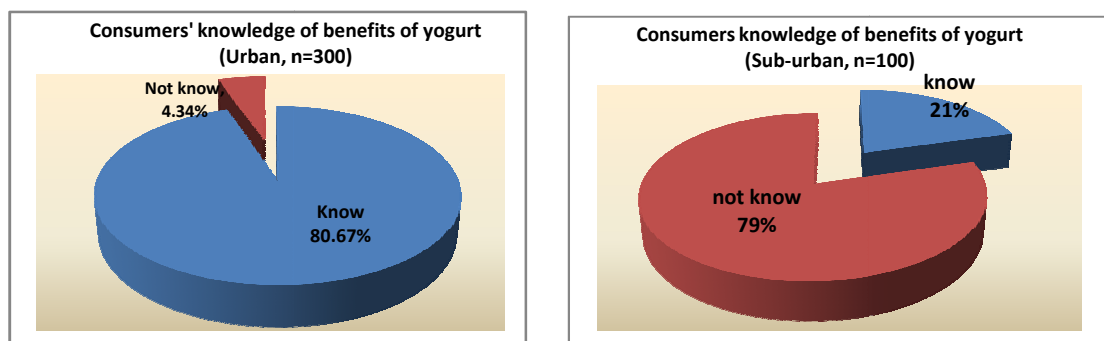


Figure 4.     Percentages of consumers' knowledge of benefits of yogurt in urban and sub-urban areas of Malang city, East Java province, Indonesia.

The following Table 4.10 presents about the advantages of consuming yogurt in both the urban and sub-urban areas of Malang City. There were some options offered to consumers related to positive sides of consuming yogurt, which the respondents could choose a maximum of two answers. It can be seen that the highest benefits of consuming yogurt mentioned by the consumers in both areas its goodness for digestibility (89.90% in the urban areas) and ( 0% in the sub-urban areas). Around 18.4 % of the respondents in the urban areas stated that yogurt is nutritious for health and could improve the digestion of minerals and vitamins, while 16.47% said that it could be used to prevent gastrointestinal infections. The other advantages of yogurt was to enhance the immune system (12.94%), to maintain skin smoothness (7.45%), and to prevent colon cancer (6.67%). Only 0.78% of the urban consumers mentioned that it was beneficial to prevent allergies.

However, approximately 20% of the sub-urban consumers believed that yogurt could prevent gastrointestinal infections and useful to prevent colon cancer (17.50%). Another benefits of yogurt was to enhance the immune system (12.50%), could improve the digestion of minerals and vitamins (7.50%), and it was nutritious for body health (7.50%). While the remaining 5% stated that one of the benefits of yogurt was to prevent allergies.

In general, the majority of the consumers in both the urban and sub-urban areas stated that the main advantages of consuming yogurt was for digestibility (60.25%), followed by another health benefits such as nutritious (12.50%), its goodness to improve the digestion of minerals and vitamins (12.50%), to prevent gastrointestinal infections (12.50%), and to enhance immune system (9.50%).

Table 4.10 Consumer knowledge of yogurt benefits in urban and sub-urban areas of Malang city, East Java province, Indonesia

| No. | The advantages of yogurt* | Urban | | Sub-urban | | Total | | % per total n = 400 |
|---|---|---|---|---|---|---|---|---|
| | | n=255 | % | n = 40 | % | n=295 | % | |
| 1 | Good for digestibility | 229 | 89.80 | 12 | 0.00 | 241 | 81.69 | 60.25 |
| 2 | Nutritious | 47 | 18.4 | | 7.50 | 50 | 16.95 | 12.50 |
| | Improve the digestion of minerals and vitamins | 47 | 18.4 | | 7.50 | 50 | 16.95 | 12.50 |
| 4 | To prevent allergies | 2 | 0.78 | 2 | 5.00 | 4 | 1. 6 | 1.00 |
| 5 | To prevent gastrointestinal infections | 42 | 16.47 | 8 | 20.00 | 50 | 16.95 | 12.50 |
| 6 | To prevent colon cancer | 17 | 6.67 | 7 | 17.50 | 24 | 8.14 | 6.00 |
| 7 | Enhance Immune system (increase the body's immune) | | 12.94 | 5 | 12.50 | 8 | 12.88 | 9.50 |
| 8 | Reduce lactose intolerance | 5 | 1.96 | 0 | 0.00 | 5 | 1.69 | 1.25 |
| 9 | Maintain skin smoothness (refine the skins) | 19 | 7.45 | 0 | 0.00 | 19 | 6.44 | 4.75 |

Remark: * This part of question is for buyers only (B=225, NB=45); sub-urban (B=40, NB=60)

## 4.4 The marketing mix's 4Ps factors influencing consumers' perceptions towards yogurt

Marketing mix is one of the major concepts in modern marketing that influences consumer reasons to purchase products and services. The information requirements for marketing program development concentrate on all the components of the marketing mix, such as product, price, place (distribution), and promotion of product. Managers combine these components to form the total marketing effort for

each market targeted. Understanding the perception of all attributes of 4P's is important in regard to understanding more about the consumers' needs and wants. As shown in Table 4.11, consumers considered the product attributes to make their final decision to purchase or not purchase yogurt. Here, Likert scale was used as an expression of the consumers' perceptions towards yogurt. These intervals are: 4.21-5.00 (the most perceived), .41-4.20 (high perceived), 2.61- .40 (moderate perceived), 1.81-2.60 (less perceived) and 1.00-1.80 (the least perceived).

As shown in Table 4.11, the urban consumers had the highest level of perceptions in aspect of product quality and highly perceptions with product characteristics consisting of five attributes products, namely, brand, variation or completeness of flavors of product, packaging of product, information contain in the label, and the guarantee of 'halal food' (label). Similarly, the consumers were highly perceived with price as main factors in decision to purchasing yogurt and as comparison with its quality. They were highly perceived about price of yogurt that beyond to reach by all levels of Indonesian society. Moreover, the consumers also were highly perceived with the other aspects such as place of products and promotion of products in all five aspects.

Nonetheless, the urban consumers had moderate perceptions with their views of yogurt as a lifestyle and prestige. In addition, they had moderate perceptions with their expectation of price changes in the future and they expected that yogurt price should be cheaper.

On the other hand, the high level of perceptions in the sub-urban areas revealed in product characteristics such as product quality, while the high level in this aspect consisted of four items, namely brand, flavor variations of yogurt, packaging and information contained in product label. Moreover, the sub-urban consumers were highly perceived with price of products as the main factor influencing purchasing decision of yogurt, and also as a determinant of product quality. The other high level of perceptions were occurred in place of product containing four items (i.e., ease in access transportation, distance, and convenience of place and services), and all five items in product promotion (i.e., attractive advertisement, promotion, competitive/rival price, family/relatives recommendation or suggestion, and information about stores).

In addition, the consumers had moderate perceptions in view of completeness of flavors in product characteriscs; two items in price of products such as changes in the product price, price prevailing in the market and product placement (i.e., ease of location). Another two less perceived items were lifestyle and prestige in product characteristics.

Table 4.11   The 4Ps aspects of marketing mix towards yogurt consumption in urban and sub-urban areas of Malang city, East Java province, Indonesia

| Aspects of Marketing Mix  4Ps | Urban  n=300 | | | Sub-urban  n=100 | | | t-Test of both areas | P-value |
|---|---|---|---|---|---|---|---|---|
| | Mean | S.D. | Level of consumers percption[1] | Mean | S.D. | Level of consumers perception | | |
| **PRODUCT Characteristics:** | | | | | | | | |
| - Brand | .7 | 1.04 | High | .90 | 0.95 | High | 0.951 | |
| - uality of product | 4.29 | 0.84 | Highest | 4.22 | 0.86 | Highest | -0.456 | |
| - Variation/completeness in flavors | .98 | 1.01 | High | .80 | 0.97 | High | **-2.361*** | 0.05 |
| - Packaging | .72 | 1.06 | High | .58 | 1.0 | High | 0.442 | |
| - Information in product label | .99 | 1.09 | High | .65 | 0.99 | High | -0.578 | |
| - 'Halal food' (label) | .76 | 0.99 | High | .28 | 0.68 | Moderate | **-3.920*** | 0.01 |
| - Lifestyle | 2.95 | 1.14 | Moderate | 2.55 | 0.9 | Less | **-2.058*** | 0.05 |
| - Prestige | 2.61 | 1.12 | Moderate | 2.55 | 0.9 | Less | -0.291 | |
| **Total of Product characteristics** | Mean:  .6 | | | Mean:  .44 | | | -1.725 | |
| **PRICE of Product:** | | | | | | | | |
| - Perception of price (Price became main factor in decision purchasing towards yogurt) | .60 | 1.17 | High | .8 | 1.19 | High | 1.112 | |
| - Price comparison with its quality | .69 | 0.90 | High | .8 | 0.87 | High | 0.8 | |
| - The price is beyond to reach | .76 | 0.99 | High | .85 | 0.97 | High | 0.554 | |
| - Yogurt price should be cheaper than the price of yogurt in market today | .18 | 1.08 | Moderate | . 0 | 1.16 | Moderate | 0.645 | |
| - Price changes | .24 | 1.09 | Moderate | 2.82 | 1.17 | Moderate | **-2.215*** | 0.05 |
| **Total Price of Product** | Mean:  .49 | | | Mean:  .5 | | | 0.28 | |
| **PLACE of Product:** | | | | | | | | |
| - The ease of location | .80 | 0.95 | High | 2.80 | 1.14 | Moderate | **-5.964*** | 0.01 |
| - The ease of access transportation | .74 | 1.01 | High | .87 | 0.88 | High | 0.814 | |
| - The distance | .61 | 1.01 | High | 4.18 | 0.81 | High | **3.340*** | 0.05 |
| - The convenience of place | .89 | 1.14 | High | 4.05 | 0.9 | High | 0.884 | |
| - Service place covering areas | .64 | 1.11 | High | .58 | 1.1 | High | -0. 19 | |
| **Total Place of Product** | Mean:  .74 | | | Mean:  .69 | | | -0. 24 | |
| **PROMOTION of Product:** | | | | | | | | |
| - Attractive advertisement | .99 | 0.9 | High | 4.08 | 0.88 | High | 0.600 | |
| - Promotion/discount strategy | .75 | 1.02 | High | .70 | 0.88 | High | -0.288 | |
| - Competitive price (of rival) | .60 | 1.08 | High | .55 | 0.96 | High | -0.255 | |
| - Family/relatives recommendation | .96 | 1.01 | High | .90 | 0.9 | High | -0. 5 | |
| - Information about the store\ | 4.15 | 0.99 | Highest | 4.05 | 1.01 | High | -0.587 | |
| **Total Promotion of Product** | Mean: 4.09 | | | Mean:  .86 | | | -0.257 | |
| **Total of Marketing Mix** | Mean:  .64; S.D.: 0.216 t –test: 1.099; p-value: 0.274 | | | | | | | |

**Note:** ***: significant at 1% level, **: significant at 5% level, *: significant at 10% level

Among these consumers' perception level of marketing mix of yogurt, the product quality has the highest score in both the areas of urban (4.29) and sub-urban (4.22).

By comparing the means value of each items of 4Ps in both the urban and sub-urban areas, it can be seen that the promotion of product have the highest mean value of 4.92 (urban) and .86 (sub-urban). Whereas for the three other P (i.e., Product, Price and Place) were has slightly different values.

Summary of the mean score of total items of 4Ps of marketing mix of yogurt, its standard deviation, t-test value, and the significant differences between the two locations can be seen in Table 4.12 as follows.

Table 4.12 Summary of mean values of marketing mix and its standard deviation

| Total of Marketing Mix | Location | Mean | S.D. |
|---|---|---|---|
| Total of Product | Urban | .6265 | 0.54 |
| | Sub-urban | .4688 | 0.4982 |
| Total of Price | Urban | .4957 | 0.6160 |
| | Sub-urban | .5250 | 0.5669 |
| Total of Place | Urban | .7 25 | 0.6957 |
| | Sub-urban | .6950 | 0.5747 |
| Total of Promotion | Urban | .886 | 0.7194 |
| | Sub-urban | .8550 | 0.6794 |
| Total Perception of Marketing Mix | Urban | .6852 | 0.4650 |
| | Sub-urban | .6 59 | 0.2158 |

## 4.4.1 Independent test between socio-economic characteristics of respondents and perceptions of 4Ps in urban and sub-urban areas of Malang city

The difference of 4Ps among the consumers with varying socio-economic characteristics in both the urban and sub-urban areas was tested by using cross tabulation and Chi-square test. The following Table 4.1 describes the results of the correlation coefficients between socio-economic factors and 4Ps in the two areas as follows.

### 1 Perceptions of Product characteristics

According to the cross tabulation and Chi-square test for independence, the result showed that the perceptions of product characteristic in the urban areas and the sub-urban areas had significant relationships with sex variable, while other socio-economic factors did not have significant relationship with the product characteristics.

### 2  Perceptions of price

In terms of the perceptions price, it showed that both of the areas had different results. In the urban areas, price of product had a significant relationship with level of education. In the sub-urban areas, price of product had significant relationship with sex and income variables.

### 3  Perceptions of place

Regarding the perceptions of place, it was shown that age has a significant relationship with place of product in the urban areas, whereas none of the socio-economic factors was significantly related with perceptions place in the sub-urban areas.

### 4  Perceptions of promotion

Regarding the perceptions of promotion, it had significant relationships with types of occupation and level of income in the urban areas. Overall, perceptions of the 4Ps there was a significant relationship with types of occupation.

### (5) Discussion of the results

Oakes and Slotterback (2001) stated that young adults was the group that easy to influenced. Basically, it depended on consumer's needs and wants. This fact is in line with Malang urban situation at present that most of the consumers' were students and teenagers/adults who are more likely to spend their time with friends in a group. Therefore, the choices of a convenience place become their consideration in purchasing yogurt.

Schiffman and Kanuk (2007) stated that gender was quite frequently used as a distinguishing segmentation variable, therefore some products and services were naturally associated more or less with male and female. It was found in the present study that more than half of Malang consumers' both of urban and sub-urban areas were dominated by female, meaning that female had higher attention in purchasing yogurt than male.

Besides, it might be due to female were more conscious about health than male. Rozin *et al.* (1999) and Steptoe *et al.* (1995) stated that women seemed to be  more concerned with their diet, weight and health control and associate with "food" and "fat", while men had a tendency to focus more on pleasure. Moreover, it

also related to female lifestyle which tended to live in groups with their friends and easier to share and follow new information about product.

Menrad and Sparke (2006) clarified that if women were found to be over presented (more than half of total respondents) among buyers in four European countries such as Poland (59%), Spain (52.10%), United Kingdom (66. 0%), and Germany (68.20%). This may be due to female tending to care more to their health than male.

Schiffman and Kanuk (2007) reported that income has long been used as an important variable for distinguishing market segments, due to it has a strong indicator of the ability (or inability) to pay for a product or a specific model of product. It is also combined with other demographic variables to more accurate define target markets. Similar with this finding, the marketers often used consumers' income level to build/construct the appropriate promotion strategies to target market segment. It is needed different of promotion strategy for each type of consumers' in their level incomes (high income level, middle income level and low income level).

Table 4.1   Summary of independent test between socio-economic variables and consumers' perceptions of 4Ps in urban and sub-urban areas of Malang city, East Java province, Indonesia.

| Perception of total 4Ps of marketing mix | Location | Age | | Sex | | Marital Status | | Education level | | Occupation | | Income level | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $\chi^2$ | p-value | $\chi^2$ | p-value | $\chi^2$ | p-value | $\chi^2$ | p-value | $\chi^2$ | p-value | $\chi^2$ | p-value |
| Total of Product characteristics | Urban | 5. 17 | 0.256 | 7.965 | **0.019** ** | 0.667 | 0.716 | 1.05 | 0.591 | 2.472 | 0.291 | 7.467 | 0.11 |
| | Sub-urban | 2.077 | 0.722 | 5.661 | **0.059** * | 1. 29 | 0.515 | 0.091 | 0.956 | 0.9 9 | 0.625 | 2.677 | 0.61 |
| Total of Price | Urban | 5.78 | 0.216 | 0.891 | 0.641 | 0.829 | 0.661 | 7.172 | **0.028** ** | 0.928 | 0.629 | 2.6 9 | 0.620 |
| | Sub-urban | 2.450 | 0.614 | 5.8 8 | **0.054** * | .194 | 0.202 | 1.551 | 0.460 | 1.772 | 0.412 | 9. 41 | **0.050** ** |
| Total of Place | Urban | 9.118 | **0.058** * | 1.040 | 0.595 | 0.494 | 0.781 | 1.621 | 0.445 | 4.482 | 0.106 | 5. 5 | 0.25 |
| | Sub-urban | 1.224 | 0.874 | 0.29 | 0.864 | 0.119 | 0.942 | 0. 17 | 0.85 | 0. 6 | 0.845 | 4.242 | 0. 74 |
| Total of Promotion | Urban | 5.069 | 0.280 | 0. 42 | 0.84 | 0. 76 | 0.828 | 0.782 | 0.677 | 5.927 | **0.052** * | 8.808 | **0.066** * |
| | Sub-urban | 7.485 | 0.112 | 0.065 | 0.968 | 0.9 9 | 0.625 | 1.269 | 0.5 0 | .20 | 0.202 | 1. 71 | 0.849 |
| Total of Marketing Mix | Urban | 6.641 | 0.156 | 0.45 | 0.797 | 0.945 | 0.62 | 1.5 2 | 0.465 | 4.942 | **0.084** * | 4.696 | 0. 20 |
| | Sub-urban | 1.501 | 0.472 | 0.005 | 0.944 | 0.674 | 0.412 | 0.462 | 0.497 | 0.998 | 0. 18 | 0.750 | 0.687 |

**Note:**  (**) statistically significant at 5% ($p < 0.05$)
      (*) statistically significant at 10% ($p < 0.1$)

Schiffman and Kanuk (2006) stated that education, occupation and income level tend to be closely correlated in almost a cause-effect relationships. It was   clear   that   the   higher   level   income   of   consumer   will   give   higher

opportunity/chance to get the best price and products/services quality as well as. Some consumers believe those higher prices are indicator of better product quality (Tellis and Gaeth, 1990).

**4.4.2   Independent sample t-test for the difference of 4Ps and factors affecting consumers perceptions towards yogurt in Malang city**

Independent samples t-test at 0.05 significance level were performed to compare the value of two different locations/areas between the urban and sub-urban areas of Malang city and to determine the significant differences among the 4Ps in both of these areas. Interpretation of the results was done at 5% level of significance where the value $p < 0.05$ was considered significant and $p < 0.01$ was considered as being highly significant.

**1      Product of characteristics**

Based on the results of the Levene's test for equality of variances as shown in Appendix B. It provides information whether the variance (variation) of scores for the two groups (urban and sub-urban) is the same or not. The outcome of this test determines which of the t-values is the correct one to use (Pallant, 2005). If the significant value is larger than 0.05, then the first line in the t-test table (refers to Equality Variances Assumed/EVA) used as t-value. On the contrary, when the significant level of the Levene's test is p=0.05 or less, then the information in the second line of the t-test table (refers to Equality Variances Non Assumed/EVNA) provided as t-values (Pallant, 2005).

Therefore, as it can be seen in Appendix B the results showed that between the urban and sub-urban areas had three significant product characteristics influencing Malang consumers' in making decision to purchase yogurt. They were variation/completeness in flavors and the consumption of yogurt became a lifestyle which had its mean values at - 0.41 and - 0. 9. The guarantee of 'halal-food' label of product was significant which had its mean difference of -0. 9, while the total product was also significant which had its mean difference of 0.16.

**2      Price of product**

With regards to price of product, there was only one item of price product that was significantly different between the urban and sub-urban areas in making decision to purchase yogurt, namely "if price of product changes" which had

its mean difference of -0.41. It means that this item influences the Malang urban and sub-urban consumers in making decision to purchase yogurt (Appendix C).

### 3    Place of product

The result of t-test (Appendix D) revealed that there were two items of place of product of marketing mix that influenced the Malang consumers' both in the urban and sub-urban areas in making decision to purchase yogurt. These were the store location (mean difference of -0.99) and the distance of store location to their residence (mean difference of 0.56).

### 4    Promotion of product

Based on the result showed in Appendix E, it described that there was no difference of promotion factor of product between the urban and sub-urban areas in making decision to purchase yogurt. All of the promotion items of product both in the urban and sub-urban areas had highly important level in influencing Malang consumers' on making decision to purchase yogurt.

## 4.5 Binary logistic regression model of consumers' purchasing decision towards yogurt

A binary logistic model with the dependent variable stating "consumers" purchasing decision towards yogurt" was used to estimate probability of consumers' decision to purchase yogurt. The binary logistic model was chosen because of the binary nature of the dependent variable (1 = consumers who likely to purchase yogurt and 0 = consumers who unlikely to purchase yogurt).

The results of binary logistic analysis (Table 4.14) revealed that there were five significant variables namely consumer's age, sex, private official occupation, housewife occupation, income level (ranged from Rp.1,500,001-2,000,000), and location dummy (urban = 1 and sub-urban = 0).

Table 4.14  Result of binary logistic regression of consumers' decision to purchase
yogurt in urban and sub-urban areas of Malang city

| Variable | Coefficient | Prob. | Z-stat |
|---|---|---|---|
| Constant | 0.26 | 0.8177 | 0.2 |
| Age (years) | **-0.05*** | **0.0897** | -1.69 |
| Sex | **1.17*** | **0.0000** | 4.1 |
| Marital status | 0.05 | 0.89 1 | 0.1 |
| Years in formal education (years) | -0.01 | 0.8675 | -0.17 |
| Occupation: | | | |
|   Government officials | -0.25 | 0.6606 | -0.44 |
|   Private officials | **-0.78*** | **0.0576** | -1.90 |
|   Businessman (self-employed) | -0.65 | 0.17 0 | -1. 6 |
|   Housewife | **-1.23*** | **0.0747** | -1.78 |
| Level of income: | | | |
|   Level of Income1 | 0.59 | 0.1918 | 1. 1 |
|   (Rp. 500,000-1,000,000) | | | |
|   Level of Income2 | -0.00 | 0.9945 | -0.006 |
|   (Rp. 1,000,001-1,500,000) | | | |
|   Level of Income | **0.96*** | **0.0970** | 1.66 |
|   (Rp. 1,500,001-2,000,000) | | | |
|   Level of Income4 | 0.61 | 0.1724 | 1. 6 |
|   (Rp. 2,000,001-2,500,000) | | | |
|   Level of Income5 (> Rp. 2,500,000) | 0.97 | 0.1250 | 1.5 |
| Location Dummy (urban = 1 and sub-urban = 0) | **2.02*** | **0.0000** | 6. |
| McFadden R-squared ($R^2$) | | 0.25 | |
| S.E. of regression | | 0. 8 | |
| Log likelihood | | -17 .02 | |
| Prediction accuracy (%) | | 81.25 | |

**Note:** ***p < 0.01, ** p < 0.05 and * p < 0.10

From the calculation results of logit model analysis (Appendix C), the
probability of these significant variables are as follow:

1)    Age

The results shows that the calculated coefficient with age is -0.01
implying that if  the consumer's age increases by 1 year old, the probability in
making decision to purchase yogurt decrease by 0.01. The negative value of age
shows that an increase in the independent variable score results in a decreased in
probability of the dependent variables (Pallant, 2005). It can be stated that younger
consumers have greater probability to consume yogurt than older consumers. The
majority of Malang urban consumers' are teenagers'/adolescence, with age ranging
between 15-20 years. This finding is consistent with some previous studies
conducted by Verbeke and Viaene (1998) who informed that younger consumers
with age less than 25 years old were dominated in consumer behavior towards

yogurt in two regions of Belgium and Poland. Menrad and Sparke (2008) also stated that Germany younger consumers prefer probiotic yogurt or dairy drinks around 5 % rather than other product category.

2) Sex

The calculated coefficient with sex is 0.25 implying that female buyer increases the probability of decision to purchase yogurt at 0.2475. This finding showed that the majority of buyers at both areas of urban and sub-urban of Malang City were female. This phenomenon was in line with Menrad and Sparke (2008) that United Kingdom women intended to buy more functional foods than men at 66. % among buyers.

) Private official

There were two types of occupations that were found to be significant, namely private official and housewife. The calculated coefficient with private official variable is -0.16 indicating that buyers who were private officials decreased the probability of decision to purchase yogurt at 0.16.

4) Housewife

The other significant variable of occupation was housewife with its calculated probability value of -0.26. It indicated that buyers with housewife occupation decreased the probability of purchasing decision towards yogurt at 0.26.

5) Income level

The calculated coefficient with level of income is -0.00077 (Rp. 1,500,001-2,000,000 per month). It can be stated, if consumers with that range of income level increase the probability of decision to purchase yogurt will decrease by 0.00077.

6) Location both of areas of urban and sub-urban

The location between two areas of Malang urban and Malang sub-urban has statistically significant coefficient of 0.4 . It means that if the consumer of the urban areas had probability of the increase purchase of yogurt by 0.4 .

**4.6 Marketing strategy implication of strategy of urban and sub-urban areas of Malang city, East Java province, Indonesia**

The last objective of this study was to identify the marketing strategies of yogurt in Malang city, East Java province, Indonesia. Both areas of Malang urban and sub-urban consumers' have different perception levels of marketing mix factors (4Ps) to make decisions to purchase yogurt. However, based on the mean values of the 4Ps, it can be stated in general that the marketing strategies for Malang urban and Malang sub-urban consumers should emphasize the promotion of product characteristics, place and price. Both of these areas should be given more attention on promotion strategy in order to expand their business and to disseminate information to consumer, especially for those who live in the sub-urban areas.

Based on the socio-economic characteristics of the respondents, mean values of each item of 4Ps as a result of Chi-square test and results of independent sample of t-Test, the marketing strategies of each areas of Malang city can be made in details as follow:

**1   Product strategies**

Product is the main tool of the marketing mix. Hair *et al.* (2000) stated that total product line was typically the focal point of investigation within product portfolio strategies.

1.1)                  Urban Strategies

- Based on socio-economic characteristic of urban consumers which are teenagers, female with age ranging between 15-20 years, mostly were students. So, the marketing strategy to promote the product was more considering about consumer' sex/gender due to the largest number of urban buyers was female. The marketers should find the *needs* and *wants* of consumers' particularly for female buyers in order to attract their interest towards yogurt by disseminating information and improving the consumer's knowledge about the benefits of yogurt.

- The other strategy is increase value added of the product. In regards of variations of flavors, strawberry still dominated as favorite taste for urban buyers (mostly for students). Therefore, it

is better for some marketers to modify their product by adding with original/real fruits (i.e., strawberry, melon, orange etc) to improve the flavor and the nutritional value contained in the product. The uniqueness taste of product also could be a key success of its products itself, i.e., yakult. The taste of yakult have been accepted by global consumers, especially for Indonesian people for long time.

- The majority of Indonesian people are Muslim, therefore the guarantee of halal-food label (including ingredient used in those products) are essential to consumers' acceptances of certain product such as yogurt. Actually, it is not one of a strategy choice but it "must be" ascertained in that product.

- Most of urban buyers have perception about yogurt as a lifestyle which means that they bought/consumed yogurt as frequently food consumption, also to satisfy their needs and wants. It is better for marketers to improve consumers' knowledge of product (i.e., benefits/advantages of yogurt consumption) in order to increase consumers' desire.

1.2)                      Sub-urban Strategies

- Based on characteristic social economic of sub-urban consumers, it was known that most buyers were female, married with age ranging between 26- 0 years, and mostly have profession as private workers. Therefore, gender/sex can be used to target market of sub-urban consumers (i.e., to attract female buyers) by providing more important knowledge/information about the benefits of yogurt in details especially for married buyers, give some discount for special price or extra cup of yogurt (for a certain number of purchases), give some prize/merchandize, etc.

- Increase the variety of product (including brand, taste and price).
  In regards of product diversification (i.e., number of variety of brand), sub-urban areas were less than urban areas. It is due to the

limitation number of yogurt stores in sub-urban, especially for handmade yogurt.

- Compare to urban area, sub-urban are much less variety of products and taste/flavor as well. The most popular taste for sub-urban buyers was plain/original. To increase number of buyers, it is better for a marketer to provide variety of flavors/tastes.

- Increase the consumer knowledge of product.

  In order to change consumers assumption about the benefits of yogurt, the marketer and producer should be disseminate/expand the important information about yogurt generally.

**2  Price strategies**

Pricing strategy involves pricing new products, establishing price level in test-market situations, and modifying prices for existing products (Hair *et al.*, 2000).

2.1)  Urban

- Most of urban consumers have academic degree from universities or still study at university. It means that generally they have higher level of education. This indicates that they have more information and knowledge about specific product therefore they have more power to make decision on purchasing yogurt.

- To minimize/reduce the relatively expensive price of yogurt, the producer/marketer could be producing the small size of yogurt. For instance, the smallcup Yakult strategy get success globally to minimize risk of expensive price perception.

2.2)  Sub-urban

- Sub-urban consumers were dominated by female with level of income range between Rp. 1,500,000-2,000,000 per month. It means that not all consumers with every level of income can buy or consume yogurt. Therefore, the marketer should consider about the relative (appropriate) price for sub-urban consumers. Generally, female were often to consider about price of product rather than male. So they were also considering about product

price changes whether to keep continue to consume or to change to another brand or yogurt stores.

**3  Place strategies**

The distribution channel used by a producer can create a strong influence on a buyer's perception of the brand (Hair *et al.*,2000).

.1)  Urban

- In regards of place and age of urban consumers, it is better for a marketer to consider about ease of location and distance of location, either near to universities or residence. Most of yogurt stores in urban area were close to city and academic institutions, therefore the target market was the students/young consumers.

- The price of product should be adjusted by young consumer's budget/income.

.2)  Sub-urban

- Similarly, a marketer should consider about the east of location and the distance of location for sub-urban consumers.

**4  Promotion strategies**

Promotion strategies are important influences on any company's sales (Hair *et al.*, 2000). Marketing strategies used to acquire information about the performance of a promotional program.

4.1)  Urban

- The largest number of urban buyers were student in universities academic level. It means they have more access to find information and knowledge about yogurt either from internet site or other media (such as news from journal/articles/lecturer). Most of yogurt producers were already made online product promotion using internet. Besides, it could also be done by using pamphlet or direct selling.

- The other alternative of promotion strategy of urban consumers was by "campus yogurt week event".

4.2)  Sub-urban

-  The alternative promotion strategy for sub-urban consumers were give more positive information of yogurt by using pamphlet or public mass media such as television.

# CHAPTER 5
## Conclusions and Recommendations

This chapter presents conclusions and recommendations derived from the research findings. This research aims: (1) to study the socio-economic characteristics of consumers towards yogurt, (2) to identify factors influencing consumers' perceptions towards yogurt, (3) to identify factors determining consumers' purchasing decision towards yogurt, and (4) to identify marketing strategies of yogurt in Malang city, East Java province, Indonesia.

## 5.1    Conclusions

1)    This study was designed to study socio-economic characteristics of consumers towards yogurt both in the urban and sub-urban areas of Malang city. The profile of the urban consumers were female, with age ranges from 15-20 years, single, as students, and has income level ranging between Rp. 1,000,001-1,500,000 per month. The sub-urban consumers have their characteristics as follow: female, age ranging from 25-30 years, married, as private official with level of income ranging between Rp. 1,500,001-2,000,000 per month.

2)    Factors relating consumers' perceptions towards yogurt in urban area were age, sex/gender, level of education, occupation, level of income, product characteristics, price, place, and promotion of product. While factors affecting sub-urban consumers' perception towards yogurt were sex, level of income, product characteristic and price of product.

3)    Factors influencing consumers' purchasing decision towards yogurt were age, sex/gender, type of occupation (private official and housewife) and level of income.

4)    The marketing strategies of yogurt in the urban areas were to consider product characteristics, sex of consumers, price, level of education, place, age, and promotion of product with level of income and type of occupation. Whereas for the sub-urban areas, a marketer is advised to focus on product characteristics, sex of consumers, and price with level of income.

**5.2    Recommendations**

According to findings, there are several recommendations from this study for the urban and sub-urban areas as follows:

1)  Urban consumers

-  The yogurt producers/marketers in the urban areas should consider variation flavors of yogurt (i.e., original fruit taste) in order to fulfill the consumers' needs and wants towards yogurt taste. They should improve the value addition of yogurt by combining with a fresh/real/original fruits.

-  They should be made a differentiation in prices to target at consumers with different levels of income by producing a small size of yogurt (i.e., Yakult).

-  The target consumers are female and teenagers with higher level of education, therefore the producers/marketers should make some products to attract them especially on health purposes

2)  Sub-urban consumers

-  The yogurt producer/marketer in the sub-urban areas also should consider about variation flavors of yogurt in order to provide the substitution of products/choice of flavors.

-  The information about yogurt should be more enhanced generally in order to improve the consumers perceptions and understanding of benefits/advantages of yogurt.

-  The yogurt producers/marketers should consider producing the small size (small cup) packages of product in order to reduce price and to minimize negative perception towards expensive yogurt as well.

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**Appendix A.  Questionnaire**

GRADUATE SCHOOL

No. Respondent: ……………………
Date: …………………………………..
Time:……………………………………
Place:……………………………………

# QUESTIONNAIRE

"CONSUMERS' PERCEPTIONS AND PURCHASING DECISION TOWARDS YOGURT:
A Case Study in Malang City, East Java Province, Indonesia"

The objectives of this research are:
(1) To study socio-economic characteristics of consumers towards yogurt,
(2) To identify factors influencing consumers' perceptions towards yogurt,
(3) To identify factors determining consumers' purchasing decision towards yogurt, and
(4) To identify marketing strategies of yogurt in Malang City, East Java Province, Indonesia.

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Advisor         : Assoc. Prof. Dr. Ayut Nissapa
Co. Advisor   : Dr. Ir. Bambang Ali Nugroho, MS. DEA.

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This questionnaire is a tool for collecting data used to thesis research. The questionnaires divided into 3 sections, such as:

Section 1      : Question about consumers' socio-economic characteristics
Section 2      : Question about consumers' knowledge of product (product knowledge)
Section 3      : Question about consumers' perception and knowledge of *'marketing mix'*  (4Ps) and decision to purchase yogurt.

# QUESTIONNAIRE

## "CONSUMERS' PERCEPTIONS AND PURCHASING DECISION TOWARDS YOGURT: A case Study in Malang City, East Java Province, Indonesia"

Directions: Please read question carefully. Answer the question by filling and give the tick to the appropriate option that represents your response.

***Section I:*** Consumers' socio-economic characteristics (*Internal Influences)*
1. Name………………………………………………………………………………………………………
2. Sex/gender:        [  ] female                                 [  ] male
3. Age (years) : ………………………………years old
4. Please indicate your current marital status:
   [ ] Single                                [ ] Married
5. Education level (years of in formal education):
   [ ] Elementary school (6y)          [ ] Diploma (15y)
   [ ] Junior high school (9y)          [ ] University (S1/S2/S3) (16y)
   [ ] Senior high school (12y)        [..] Others (please specify)………………………………
6. Occupation:
   [ ] Student                                [ ] Entrepreneur
   [ ] Government employee            [ ] Housewife
   [ ] Private employee                  [ ] others (please specify)………………………………
7. In which of following categories does your total (approximate) monthly income falls (Rp/month):
   [ ] 500.000 - 1.000.000                    [  ] Between 2.000.001 - 2.500.000
   [ ] Between 1.000.001 - 1.500.000      [ ] Between 2.500.001 – ≤ 3.500.000
   [ ] Between 1.500.001 – 2.000.000      [ ] Others (please specify)……………………
8. Address                :  …………………………………………………………………………………………
9. Phone number        :  …………………………………………………………………………………………
10. Email address *(if any)*: …………………………………………………………………………………………

***Section II:*** Consumers' knowledge of Yogurt (product knowledge)
11. Do you know about "yogurt" or what is yogurt actually?
    [a]  Yes
    [b]  No

12. Have you ever already bought *and/or* consumes yogurt (before)?
    [a] Yes
    [b] No

13. Have you ever already consumes yogurt within the latest six months?
    [a] Yes                                      → Continue with Question 14 until 25
    [b] No                                       → Continue with Question 28 & 29

    **Question No. 13-24 only for "buyer"**
14. When was the last time you consumes yogurt?
    [a] several (1-4) days ago
    [b] a week ago
    [c] 2-3 weeks ago
    [d] a month ago

[e] More than two months ago
[f] Others(pls specify)…………………………………………………………………………………

**15.** How often have you bought **yogurt** within the past six months?
[a] 2-3 times a week or more often
[b] Once a week
[c] Once in two weeks
[d] Once a month
[e] Once in more than two months
[f] Others (pls specify)…………………………………………………………………………………

16. How long have you been consuming yogurt?
[a]  more than 2 years
[b] 1-2 years
[c] 6,5 – 12 months
[d] 2,5 – 6 months
[e] around 1-2 months
[f] Others(pls specify)…………………………………………………………………………………

17. Is anyone in your family members that consumes yogurt than you?
[a] All family
[b] Father/mother
[c] Brother/sister
[d] Husband/Wife/Kids
[e] None
[f] Others(pls specify)…………………………………………………………………………………

18. How did you know about yogurt? (max two answers possible)
[a]  Product advertisement in TV, newspapers, internet or in other media
[b]  Reports in newspaper, on TV, on internet or in other media
[c]  Product description (label) on the packaging
[d]  Scientific journal/article/magazine
[e]  Family, relatives
[f]  Friends
[g]  Medical doctor/pharmacy suggestion
[h]  Lecturer/teacher
[i]  Others (pls specify)…………………………………………………………………………………

19. **Reason of consumes yogurt.** Why do you buy yogurt? (please assess the importance of the following possible reason, max two answers possible)
[a] To stay healthy
[b] For diet
[c] For particular treatment or therapy
[d] To retard aging
[e] Good taste
[f] Recommended by medical doctor/nutritional consultant
[g] Others (please specify)…………………………………………………………………………….

20. What brand of yogurt that you have ever knew or consumed before? Please mention it! ………………………………………………………………………………………………

21. What types of yogurt have you ever bought and consumes? (Several answers possible)
[a]  Drinking yogurt
[b] Frozen yogurt

22. What type of yogurt (as mention above) that you like most? (one answer only)
[a]  Drinking yogurt

[b] Frozen yogurt

23. What is your **favorite flavored** of yogurt? (choose one answer only)

| | | |
|---|---|---|
| [a] Plain | [e] Lychee | [i] Orange/lemon |
| [b] Blueberry | [f] Chocolate | [j] Vanilla |
| [c] Strawberry | [g] Melon | [k] Others………………………………. |
| [d] Grape | [h] Mango | |

24. What taste of yogurt that you **dislike most**?(choose one answer only)

| | | |
|---|---|---|
| [a] Plain | [e] Lychee | [i] Orange/lemon |
| [b] Blueberry | [f] Chocolate | [j] Vanilla |
| [c] Strawberry | [g] Melon | [k] None |
| [d] Grape | [h] Mango | [l] Others………………………………. |

25. **Consumers knowledge about the advantages of consuming yogurt**. Do you know the benefits of consuming yogurt?
    [a] Yes
    [b] No

26. According to you, what is the main advantage or benefit of consuming yogurt? (max 2 answers possible)
    [a] Good for digestibility
    [b] Nutritious
    [c] Improve the digestion of minerals and vitamins
    [d] To prevent allergies
    [e] To prevent gastrointestinal infections
    [f] To prevent colon cancer
    [g] Enhance Immune system (increase the body's immune)
    [h] Reduce lactose intolerance
    [i] Maintain skin smoothness (refine the skins)
    [j] Others (please specify)………………………………………………………………….……

27. How is your perception about yogurt? Please explain with your own words!
    ………………………………………………………………………………………………………..

28. **Question No. 28 & 29 are for "non-buyers"**
    What are your reasons for **not purchase** yogurt? (Several answer possible).
    [a] Too expensive
    [b] Not effective
    [c] Bad taste (do not like the taste)
    [d] I do not feel ill
    [e] This product not common or unfamiliar and/or never heard about yogurt before
    [f] I prefer drink milk/fresh milk
    [g] Others (please specify)

29. Which pre-conditions have to be fulfilled that you might buy yogurt? (several answered possible)
    [a] If recommended by medical doctor or nutritional consultant
    [b] If it has lower prices
    [c] If recommended by friends or relatives
    [d] Occurrence of health problems
    [e] Disposition of specific diseases (i.e., digestion problem)
    [f] Safe/certainty of no side effects
    [g] Clear evidence of efficacy of such products
    [h] If it has a good taste (and smell)
    [i] Other (please specify)………………………………………………………………………………

**Section III:** Consumers' perception and knowledge of *Marketing Mix "4Ps"* (Consumers knowledge of product, price, place and promotion) and decision to purchase yogurt (**Question for buyer (only):**

Please choose one answer (by give cross) which suitable with your assessment based on level of your agreement ranging from 1-5.

A. PRODUCT

| No. | Perception of Product | Strongly agree | Somewhat agree | Neutral | Somewhat disagree | Strongly disagree |
|---|---|---|---|---|---|---|
| | | 5 | 4 | 3 | 2 | 1 |
| 1 | According to you, **brand** becomes your consideration when make a decision to buy yogurt. | | | | | |
| 2 | A **Quality of product** becomes your consideration when purchasing yogurt. | | | | | |
| 3 | The **variations in flavor** which available at that store becomes your consideration when purchasing yogurt. | | | | | |
| 4 | If you ever purchasing and/or consumes processed yogurt from manufacture, **packaging** become your consideration in deciding of purchasing yogurt. | | | | | |
| 5 | If you ever purchasing and/or consumes processed yogurt from manufacture, **information in product label** becomes your consideration in deciding of purchasing yogurt. | | | | | |
| 6 | The **guarantee of "halal food" label** in a yogurt product becomes your consideration in deciding to buy yogurt. | | | | | |
| 7 | Consuming yogurt becomes a part of your **lifestyle** | | | | | |
| 8 | Consuming yogurt become a **prestige** to you | | | | | |
| | *Total:* | | | | | |

B. PRICE

| No. | Perception of Price | Strongly agree | Somewhat agree | Neutral | Somewhat disagree | Strongly disagree |
|---|---|---|---|---|---|---|
| | | 5 | 4 | 3 | 2 | 1 |
| 1 | According to you, price is becomes main consideration in decision to buy yogurt | | | | | |
| 2 | According to you, prices of yogurt offered in this store have in accordance with its quality | | | | | |
| 3 | According to you, price of yogurt is beyond reach (too expensive) | | | | | |
| 4 | Prices of yogurt in the market today are too expensive and difficult to reach by public/society. (Price of yogurt should cheaper than current price now) | | | | | |
| 5 | If yogurt prices in this store increased, you will keep considering purchasing yogurt at this store | | | | | |
| | *Total:* | | | | | |

C. PLACE

| No. | Perception of Place | Strongly agree 5 | Somewhat agree 4 | Neutral 3 | Somewhat disagree 2 | Strongly disagree 1 |
|---|---|---|---|---|---|---|
| 1 | The **ease of location** in getting yogurt become your consideration in decision purchasing yogurt | | | | | |
| 2 | The **ease of access transportation** becomes your consideration in decision purchasing yogurt | | | | | |
| 3 | The **distance** between yogurt store and your residence become your consideration in decision purchasing yogurt | | | | | |
| 4 | The **convenience of this place (yogurt store)** becomes your consideration in decision purchasing yogurt | | | | | |
| 5 | The **service of salespeople** at the area stores becomes your consideration in decision purchasing yogurt | | | | | |
| | **Total:** | | | | | |

D. PROMOTION

| No. | Perception of Promotion | Strongly agree 5 | Somewhat agree 4 | Neutral 3 | Somewhat disagree 2 | Strongly disagree 1 |
|---|---|---|---|---|---|---|
| 1 | Any information about this store is affecting you in purchasing yogurt decision. | | | | | |
| 2 | The attractiveness of advertising is affecting you in purchasing yogurt decision. | | | | | |
| 3 | The existences of rival product with competitive prices become your consideration in purchasing yogurt. | | | | | |
| 4 | Any promotion and/or discount becomes your consideration in purchasing yogurt decision. | | | | | |
| 5 | Your friend or your family suggestion becomes your consideration in purchasing yogurt. | | | | | |
| | **Total:** | | | | | |

**Thank you for your participation and cooperation!**

-------------------------------------------------------------------------------------------

**Appendix B**

Result of t-test of difference of product characteristic factor affecting consumers' perceptions towards yogurt in Malang city, East Java province, Indonesia

| Product | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| Brand of product | EVA | 0.941 | 0.333 | 0.951 | 293 | 0.343 | 0.17 | 0.175 | -0.178 | 0.512 |
| | EVNA | | | 1.013 | 54.624 | 0.316 | 0.17 | 0.165 | -0.163 | 0.497 |
| Quality of product | EVA | 0.210 | 0.647 | -0.456 | 293 | 0.649 | -0.07 | 0.143 | -0.347 | 0.216 |
| | EVNA | | | -0.446 | 51.261 | 0.657 | -0.07 | 0.146 | -0.358 | 0.228 |
| **Variations/completeness in flavors** | EVA | 0.865 | 0.353 | -2.361 | 293 | **0.019(\*\*)** | -0.41 | 0.172 | -0.743 | -0.067 |
| | EVNA | | | -2.312 | 51.236 | 0.025 | -0.41 | 0.175 | -0.757 | -0.053 |
| Packaging | EVA | 0.801 | 0.372 | 0.442 | 293 | 0.659 | 0.08 | 0.178 | -0.271 | 0.428 |
| | EVNA | | | 0.471 | 54.693 | 0.639 | 0.08 | 0.166 | -0.255 | 0.412 |
| Information in product label | EVA | 0.056 | 0.813 | -0.578 | 293 | 0.564 | -0.11 | 0.182 | -0.464 | 0.254 |
| | EVNA | | | -0.617 | 54.710 | 0.540 | -0.11 | 0.171 | -0.448 | 0.237 |
| **The guarantee of halal food label** | EVA | 7.608 | 0.006 | -2.996 | 293 | 0.003 | -0.49 | 0.162 | -0.805 | -0.167 |
| | EVNA | | | -3.920 | 68.124 | **0.000 (\*\*\*)** | -0.49 | 0.124 | -0.733 | -0.239 |
| **Lifestyle** | EVA | 0.543 | 0.462 | -2.058 | 293 | **0.040 (\*\*)** | -0.39 | 0.190 | -0.765 | -0.017 |
| | EVNA | | | -2.387 | 59.072 | 0.020 | -0.39 | 0.164 | -0.719 | -0.063 |
| Prestige | EVA | 2.517 | 0.114 | -0.291 | 293 | 0.772 | -0.05 | 0.186 | -0.419 | 0.311 |
| | EVNA | | | -0.331 | 57.964 | 0.742 | -0.05 | 0.163 | -0.380 | 0.273 |
| **Total of Product** | EVA | 0.463 | 0.497 | -1.725 | 293 | 0.086 | -0.16 | 0.091 | -0.338 | 0.022 |
| | EVNA | | | -1.837 | 54.611 | **0.072 (\*)** | -0.16 | 0.086 | -0.330 | 0.014 |

Note:
- (\*\*\*)     indicate statistically significant differences at $p < 0.01$
- (\*\*)     indicate statistically significant differences at $p < 0.05$
- (\*)     indicate statistically significant differences at $p < 0.1$
- EVA     indicates Equality of Variances Applied
- EVNA     indicates Equality of Variances Not Assumed

## Appendix C

Result of t-test of difference of price of product factor affecting consumers' perceptions towards yogurt in Malang city, East Java province, Indonesia

| Price of product | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| Price becomes main factor | EVA | 0.097 | 0.755 | 1.112 | 293 | 0.267 | 0.22 | 0.199 | -0.170 | 0.613 |
| | EVNA | | | 1.091 | 51.311 | 0.280 | 0.22 | 0.203 | -0.186 | 0.628 |
| Price comparison with its quality | EVA | 0.315 | 0.575 | 0.833 | 293 | 0.406 | 0.13 | 0.152 | -0.173 | 0.427 |
| | EVNA | | | 0.851 | 52.837 | 0.399 | 0.13 | 0.149 | -0.172 | 0.426 |
| The price is beyond to reach | EVA | 0.364 | 0.547 | 0.554 | 293 | 0.580 | 0.09 | 0.168 | -0.238 | 0.424 |
| | EVNA | | | 0.560 | 52.413 | 0.578 | 0.09 | 0.166 | -0.240 | 0.427 |
| Product (=yogurt) price should be cheaper | EVA | 0.619 | 0.432 | 0.645 | 293 | 0.519 | 0.12 | 0.185 | -0.245 | 0.484 |
| | EVNA | | | 0.612 | 50.180 | 0.543 | 0.12 | 0.195 | -0.273 | 0.512 |
| **Price changes** | EVA | 0.564 | 0.453 | -2.215 | 293 | **0.028 (\*\*)** | -0.41 | 0.187 | -0.782 | -0.046 |
| | EVNA | | | -2.095 | 50.062 | 0.041 | -0.41 | 0.198 | -0.811 | -0.017 |
| Total of Price | EVA | 0.351 | 0.554 | 0.283 | 293 | 0.778 | 0.03 | 0.104 | -0.175 | 0.233 |
| | EVNA | | | 0.300 | 54.496 | 0.765 | 0.03 | 0.098 | -0.166 | 0.225 |

**Note**:  (\*\*)  indicate statistically significant differences at $p < 0.05$
EVA  indicates Equality of Variances Applied
EVNA  indicates Equality of Variances Not Assumed

**Appendix D**

Result of t-test of difference of place of product factor affecting consumers' perceptions towards yogurt in Malang city, East Java province, Indonesia

| Place of product | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| **Ease of location** | EVA | 2.862 | 0.092 | -5.964 | 293 | **0.000 (***)** | -0.99 | 0.166 | -1.320 | -0.665 |
| | EVNA | | | -5.239 | 47.955 | 0.000 | -0.99 | 0.189 | -1.373 | -0.611 |
| Ease of public transportation | EVA | 2.884 | 0.091 | 0.814 | 293 | 0.416 | 0.14 | 0.169 | -0.195 | 0.471 |
| | EVNA | | | 0.899 | 56.327 | 0.372 | 0.14 | 0.153 | -0.169 | 0.445 |
| **The distance between location an d residential** | EVA | 2.675 | 0.103 | 3.340 | 293 | **0.001 (***)** | 0.56 | 0.167 | 0.230 | 0.889 |
| | EVNA | | | 3.905 | 59.569 | 0.000 | 0.56 | 0.143 | 0.273 | 0.846 |
| The convenience of place | EVA | 2.114 | 0.147 | 0.884 | 293 | 0.377 | 0.17 | 0.190 | -0.206 | 0.541 |
| | EVNA | | | 1.023 | 58.965 | 0.310 | 0.17 | 0.164 | -0.160 | 0.495 |
| Service place covering area | EVA | .270 | 0.604 | -0.319 | 293 | 0.750 | -0.06 | 0.189 | -0.432 | 0.311 |
| | EVNA | | | -0.315 | 51.446 | 0.754 | -0.06 | 0.192 | -0.445 | 0.324 |
| Total of Place | EVA | 2.857 | 0.092 | -0.324 | 293 | 0.746 | -0.04 | 0.116 | -0.265 | 0.190 |
| | EVNA | | | -0.373 | 58.516 | 0.711 | -0.04 | 0.101 | -0.239 | 0.164 |

**Note**:  (***)  indicate statistically significant differences at $p < 0.01$
  (**)  indicate statistically significant differences at $p < 0.05$
  EVA  indicates Equality of Variances Applied
  EVNA  indicates Equality of Variances Not Assumed

**Appendix E**

Result of t-test of difference of promotion of product factor affecting consumers' perceptions towards yogurt in Malang city, East Java province, Indonesia

| Promotion of product | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| Attractiveness of advertisement | EVA | 0.051 | 0.822 | 0.600 | 293 | 0.549 | 0.09 | 0.158 | -.216 | .405 |
| | EVNA | | | 0.622 | 53.405 | 0.537 | 0.09 | 0.152 | -0.210 | 0.400 |
| Promotion or discount strategy | EVA | 1.448 | 0.230 | -0.288 | 293 | 0.774 | -0.05 | 0.170 | -0.384 | 0.286 |
| | EVNA | | | -0.319 | 56.636 | 0.751 | -0.05 | 0.153 | -0.356 | 0.258 |
| Competitive price (of rival) | EVA | 0.500 | 0.480 | -0.255 | 293 | 0.799 | -0.05 | 0.181 | -0.402 | 0.310 |
| | EVNA | | | -0.277 | 55.654 | 0.782 | -0.05 | 0.166 | -0.379 | 0.287 |
| Family or relatives recommendation | EVA | 1.126 | 0.290 | -0.335 | 293 | 0.738 | -0.06 | 0.170 | -0.391 | 0.277 |
| | EVNA | | | -0.356 | 54.507 | 0.723 | -0.06 | 0.160 | -0.377 | 0.263 |
| Information about the store | EVA | 0.067 | 0.796 | -0.587 | 293 | 0.558 | -0.10 | 0.169 | -0.431 | 0.233 |
| | EVNA | | | -0.577 | 51.392 | 0.566 | -0.10 | 0.171 | -0.443 | 0.245 |
| Total of Promotion | EVA | 1.236 | 0.267 | -0.257 | 293 | 0.797 | -0.03 | 0.121 | -0.270 | 0.208 |
| | EVNA | | | -0.268 | 53.673 | 0.789 | -0.03 | 0.116 | -0.265 | 0.202 |
| **Total of Marketing Mix** | EVA | 4.081 | 0.044 | 17.426 | 293 | 0.000 | 1.29 | 0.074 | 1.148 | 1.441 |
| | EVNA | | | 22.268 | 66.022 | **0.000 (***)** | 1.29 | 0.058 | 1.178 | 1.411 |

Note:   (*)        indicate statistically significant differences at p < 0.1
EVA       indicates Equality of Variances Applied
EVNA     indicates Equality of Variances Not Assumed

## Appendix F

Results of Reliability Test of 4Ps of Marketing Mix

**1)      R E L I A B I L I T Y   A N A L Y S I S  -  S C A L E   (A L P H A) of PRODUCT**

### *Correlation Matrix*

|         | QPROD1  | QPROD2  | QPROD3  | QPROD4  | QPROD5  |
|---------|---------|---------|---------|---------|---------|
| QPROD1  | 1.0000  |         |         |         |         |
| QPROD2  | .3651   | 1.0000  |         |         |         |
| QPROD3  | .3835   | .0458   | 1.0000  |         |         |
| QPROD4  | .5104   | .0193   | .1830   | 1.0000  |         |
| QPROD5  | .4197   | .0612   | .3662   | .4880   | 1.0000  |
| QPROD6  | .1833   | .0712   | .5323   | .0667   | .1512   |
| QPROD7  | .2077   | -.0908  | .0494   | .1517   | -.2910  |
| QPROD8  | .1710   | -.1140  | .1938   | .0079   | -.4107  |

|         | QPROD6  | QPROD7  | QPROD8  |
|---------|---------|---------|---------|
| QPROD6  | 1.0000  |         |         |
| QPROD7  | .2971   | 1.0000  |         |
| QPROD8  | .0932   | .8363   | 1.0000  |

 N of Cases =      30.0

**Item-total Statistics**

|         | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Alpha If Item Deleted |
|---------|---------|---------|---------|---------|---------|
| QPROD1  | 24.8333 | 15.9368 | .6522   | .6111   | .4729   |
| QPROD2  | 23.7000 | 22.4931 | .0939   | .2821   | .6255   |
| QPROD3  | 24.3667 | 17.8954 | .3871   | .5173   | .5584   |
| QPROD4  | 24.7000 | 17.5966 | .4351   | .4466   | .5435   |
| QPROD5  | 24.5333 | 18.5333 | .2195   | .5306   | .6202   |
| QPROD6  | 24.7000 | 18.9759 | .3860   | .3935   | .5634   |
| QPROD7  | 25.2333 | 19.4264 | .2949   | .7845   | .5868   |
| QPROD8  | 25.5667 | 21.4264 | .0671   | .8044   | .6496   |

**Reliability Coefficients     8 items**
**Alpha =  .6143**          Standardized item alpha =   .6089

**Appendix F (cont'd)**

**2)        R E L I A B I L I T Y   A N A L Y S I S  -  S C A L E  (A L P H A) of PRICE**

*Correlation Matrix*

|      | QPR1   | QPR2   | QPR3   | QPR4   | QPR5   |
|------|--------|--------|--------|--------|--------|
| QPR1 | 1.0000 |        |        |        |        |
| QPR2 | .0213  | 1.0000 |        |        |        |
| QPR3 | .1037  | .4554  | 1.0000 |        |        |
| QPR4 | .3017  | -.1498 | -.0447 | 1.0000 |        |
| QPR5 | .3712  | -.0895 | .0499  | .5229  | 1.0000 |

*N of Cases =      30.0*

**Item Means**

| Mean   | Minimum | Maximum | Range | Max/Min | Variance |
|--------|---------|---------|-------|---------|----------|
| 3.4067 | 3.0000  | 3.6667  | .6667 | 1.2222  | .0847    |

**Item-total Statistics**

|      | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Alpha if Item Deleted |
|------|------------|------------|------------|------------|------------|
| QPR1 | 13.4667    | 7.4299     | .3446      | .1638      | .3639      |
| QPR2 | 13.4333    | 9.6333     | .0985      | .2277      | .5180      |
| QPR3 | 13.3667    | 8.3092     | .2088      | .2212      | .4626      |
| QPR4 | 13.8333    | 7.9368     | .2659      | .3003      | .4225      |
| QPR5 | 14.0333    | 7.6885     | .3907      | .3286      | .3405      |

**Reliability Coefficients     5 items**
**Alpha =  .4823**        Standardized item alpha =   .4769

**Appendix F(cont'd)**

1)  **R E L I A B I L I T Y   A N A L Y S I S  -  S C A L E  (A L P H A) of PLACE**

### Correlation Matrix

|        | QPRO1  | QPRO2  | QPRO3  | QPRO4  | QPRO5  |
|--------|--------|--------|--------|--------|--------|
| QPRO1  | 1.0000 |        |        |        |        |
| QPRO2  | .4549  | 1.0000 |        |        |        |
| QPRO3  | .2265  | .6447  | 1.0000 |        |        |
| QPRO4  | .4762  | .3405  | .4976  | 1.0000 |        |
| QPRO5  | .2468  | .0221  | .1743  | .3639  | 1.0000 |

*N of Cases =*   30.0

**Item Means**

| Mean   | Minimum | Maximum | Range | Max/Min | Variance |
|--------|---------|---------|-------|---------|----------|
| 3.5467 | 3.4000  | 3.7333  | .3333 | 1.0980  | .0292    |

**Item-total Statistics**

|        | Scale Mean If Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Alpha if Item Deleted |
|--------|---------|---------|---------|---------|---------|
| QPRO1  | 14.0000 | 10.6207 | .5020 | .3983 | . 6762 |
| QPRO2  | 14.3000 | 10.7000 | .5166 | .5505 | .6703 |
| QPRO3  | 14.3000 | 10.9069 | .5558 | .5514 | . 6576 |
| QPRO4  | 14.0000 | 9.6552  | .6089 | . 4384 | 6295 |
| QPRO5  | 14.3333 | 12.7816 | .2704 | .1733 | .7561 |

**Reliability Coefficients    5 items**
**Alpha =  .7281**          Standardized item alpha =   .7246

**Appendix F(cont'd)**

**4)    R E L I A B I L I T Y   A N A L Y S I S  -  S C A L E   (A L P H A) of PROMOTION**

### *Correlation Matrix*

|        | QPLA1   | QPLA2  | QPLA3  | QPLA4  | QPLA5  |
|--------|---------|--------|--------|--------|--------|
| QPLA1  | 1.0000  |        |        |        |        |
| QPLA2  | .9054   | 1.0000 |        |        |        |
| QPLA3  | .6258   | .6321  | 1.0000 |        |        |
| QPLA4  | .3178   | .2567  | .5585  | 1.0000 |        |
| QPLA5  | -.0619  | .0966  | .2764  | .4227  | 1.0000 |

*N of Cases =    30.0*

**Item Means**

| Mean   | Minimum | Maximum | Range | Max/Min | Variance |
|--------|---------|---------|-------|---------|----------|
| 3.8533 | 3.7333  | 3.9667  | .2333 | 1.0625  | .0103    |

**Item-total Statistics**

|       | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Alpha if Item Deleted |
|-------|----------------------------|-------------------------------|----------------------------------|------------------------------|-----------------------|
| QPLA1 | 15.4000                    | 10.5241                       | .6113                            | .8713                        | .7039                 |
| QPLA2 | 15.5000                    | 10.2586                       | .6581                            | .8623                        | .6872                 |
| QPLA3 | 15.5333                    | 9.5678                        | .7440                            | .5762                        | . 6526                |
| QPLA4 | 15.3000                    | 11.2517                       | .5235                            | .4645                        | .7344                 |
| QPLA5 | 15.3333                    | 12.9885                       | .2233                            | .3885                        | .8319                 |

**Reliability Coefficients    5 items**
**Alpha =  .7703**        Standardized item alpha =   .7715

**Appendix F(cont'd)_**

**1)   R E L I A B I L I T Y   A N A L Y S I S  -  S C A L E   (A L P H A) of PRODUCT**

|   |       | Mean   | Std Dev | Cases |
|---|-------|--------|---------|-------|
| 1 | PROD1 | 3.4000 | 1.919   |       |
| 2 | PROD3 | 3.8667 | 1.2521  |       |
| 3 | PROD4 | 3.5333 | 1.2243  |       |
| 4 | PROD5 | 3.7000 |         |       |
| 5 | PROD6 | 3.5333 |         |       |

### Correlation Matrix

|       | PROD1  | PROD3  | PROD4  | PROD5  | PROD6  |
|-------|--------|--------|--------|--------|--------|
| PROD1 | 1.0000 |        |        |        |        |
| PROD3 | .3835  | 1.0000 |        |        |        |
| PROD4 | .5104  | .1830  | 1.0000 |        |        |
| PROD5 | .4197  | .3662  | .4880  | 1.0000 |        |
| PROD6 | .1833  | .5323  | .0667  | .1512  | 1.0000 |

*N of Cases =      30.0*

**N of Statistics for Scale**

| Mean    | Variance | Std Dev | Variables |
|---------|----------|---------|-----------|
| 18.0333 | 18.1023  | 4.2547  | 5         |

**Item Means**

| Mean   | Minimum | Maximum | Range | Max/Min | Variance |
|--------|---------|---------|-------|---------|----------|
| 3.6067 | 3.4000  | 3.8667  | .4667 | 1.1373  | .0324    |

**Inter-item Correlations**

| Mean  | Minimum | Maximum | Range | Max/Min | Variance |
|-------|---------|---------|-------|---------|----------|
| .3284 | .0667   | .5323   | .4656 | 7.9806  | .0269    |

**Item-total Statistics**

|       | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Alpha if Item Deleted |
|-------|---------|---------|-------|-------|-------|
| PROD1 | 14.6333 | 12.1023 | .5522 | .3588 | .6317 |
| PROD3 | 14.1667 | 12.0747 | .5125 | .4082 | .6463 |
| PROD4 | 14.5000 | 12.6034 | .4602 | .3598 | .6678 |
| PROD5 | 14.3333 | 10.7816 | .5219 | .3304 | .6442 |
| PROD6 | 14.5000 | 14.5345 | .3126 | .2857 | .7183 |

**Reliability Coefficients     5 items**
**Alpha =  .7121**          Standardized item alpha =   .70

**Appendix F(cont'd)**

2)  **R E L I A B I L I T Y   A N A L Y S I S   -   S C A L E   (A L P H A) of PRICE**

|   |      | Mean   | Std Dev | Cases |
|---|------|--------|---------|-------|
| 1. | QPR1 | 3.5667 | 1.2507  | 30.0  |
| 2. | QPR4 | 3.2000 | 1.2429  | 30.0  |
| 3. | QPR5 | 3.0000 | 1.1142  | 30.0  |

### *Correlation Matrix*

|      | QPR1   | QPR4   | QPR5   |
|------|--------|--------|--------|
| QPR1 | 1.0000 |        |        |
| QPR4 | .3017  | 1.0000 |        |
| QPR5 | .3712  | .5229  | 1.0000 |

*N of Cases =     30.0*

**N of Statistics for Scale**

| Mean   | Variance | Std Dev | Variables |
|--------|----------|---------|-----------|
| 9.7667 | 7.7713   | 2.7877  | 3         |

**Item Means**

| Mean   | Minimum | Maximum | Range  | Max/Min | Variance |
|--------|---------|---------|--------|---------|----------|
| 3.2556 | 3.0000  | 3.5667  | .5667  | 1.1889  | .0826    |

**Inter-item Correlations**

| Mean   | Minimum | Maximum | Range  | Max/Min | Variance |
|--------|---------|---------|--------|---------|----------|
| .3986  | .3017   | .5229   | .2212  | 1.7334  | .0102    |

**Item-total Statistics**

|      | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Alpha if Item Deleted |
|------|------|------|------|------|------|
| QPR1 | 6.2000 | 4.2345 | .3832 | .1537 | .6840 |
| QPR4 | 6.5667 | 3.8402 | .4898 | .2869 | .5388 |
| QPR5 | 6.7667 | 4.0471 | .5538 | .3235 | .4635 |

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**Reliability Coefficients     3 items**
**Alpha =   .6603**          Standardized item alpha =   .6654

**Appendix G**

Result of Binary logit models of both urban and sub-urban areas of Malang city

Dependent Variable: PERC
Method: ML - Binary Logit (Quadratic hill climbing)
Date: 12/02/11   Time: 13:47
Sample: 1 400
Included observations: 400
Convergence achieved after 5 iterations
Covariance matrix computed using second derivatives

| Variable | Coefficient | Std. Error | z-Statistic | Prob. |
|---|---|---|---|---|
| C | 0.264361 | 1.146594 | 0.230562 | 0.8177 |
| AGE | -0.050688 | 0.029866 | -1.697165 | 0.0897 |
| SEX | 1.174331 | 0.284555 | 4.126907 | 0.0000 |
| MS | 0.055917 | 0.416072 | 0.134393 | 0.8931 |
| YEARS | -0.013973 | 0.083723 | -0.166896 | 0.8675 |
| GOV | -0.254840 | 0.580435 | -0.439050 | 0.6606 |
| PRI | -0.780325 | 0.410907 | -1.899030 | 0.0576 |
| BSS | -0.646609 | 0.474521 | -1.362658 | 0.1730 |
| HWF | -1.228807 | 0.689503 | -1.782164 | 0.0747 |
| DINC1 | 0.589899 | 0.451962 | 1.305197 | 0.1918 |
| DINC2 | -0.003655 | 0.526772 | -0.006938 | 0.9945 |
| DINC3 | 0.961859 | 0.579572 | 1.659604 | 0.0970 |
| DINC4 | 0.609961 | 0.447053 | 1.364403 | 0.1724 |
| DINC5 | 0.974190 | 0.635090 | 1.533939 | 0.1250 |
| U__LOC_01 | 2.020119 | 0.319272 | 6.327269 | 0.0000 |

| | | | | |
|---|---|---|---|---|
| Mean dependent var | 0.737500 | S.D. dependent var | | 0.440544 |
| S.E. of regression | 0.377938 | Akaike info criterion | | 0.940105 |
| Sum squared resid | 54.99221 | Schwarz criterion | | 1.089785 |
| Log likelihood | -173.0209 | Hannan-Quinn criter. | | 0.999380 |
| Restr. log likelihood | -230.2623 | Avg. log likelihood | | -0.432552 |
| LR statistic (14 df) | 114.4827 | McFadden R-squared | | 0.248592 |
| Probability(LR stat) | 0.000000 | | | |

| | | | | |
|---|---|---|---|---|
| Obs with Dep=0 | 105 | Total obs | | 400 |
| Obs with Dep=1 | 295 | | | |

**Appendix H**

Calculation example of logit model

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 27 | 0 | 0 | 0 | 0 | 1 | 0.916975 | 2.718 | 0.3997644 | 0.7144059 |
| 2 | 25 | 0 | 0 | 0 | 0 | 1 | 1.018351 | 2.718 | 0.3612282 | 0.7346307 |
| 3 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 4 | 23 | 0 | 0 | 0 | 0 | 1 | 1.119727 | 2.718 | 0.3264068 | 0.7539165 |
| 5 | 26 | 1 | 1 | 0 | 0 | 1 | 1.361669 | 2.718 | 0.2562689 | 0.7960079 |
| 6 | 21 | 0 | 0 | 0 | 0 | 1 | 1.221103 | 2.718 | 0.294942 | 0.7722353 |
| 7 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |
| 8 | 18 | 1 | 0 | 0 | 0 | 1 | 2.547498 | 2.718 | 0.0782979 | 0.9273875 |
| 9 | 22 | 0 | 0 | 0 | 1 | 1 | 1.16676 | 2.718 | 0.3114118 | 0.762537 |
| 10 | 34 | 1 | 0 | 0 | 0 | 1 | 1.73649 | 2.718 | 0.1761693 | 0.8502178 |
| 11 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 12 | 21 | 1 | 1 | 0 | 0 | 1 | 1.615109 | 2.718 | 0.1989023 | 0.8340963 |
| 13 | 25 | 0 | 0 | 0 | 0 | 1 | 1.018351 | 2.718 | 0.3612282 | 0.7346307 |
| 14 | 19 | 0 | 0 | 0 | 0 | 1 | 1.322479 | 2.718 | 0.2665104 | 0.7895711 |
| 15 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 16 | 24 | 1 | 0 | 0 | 0 | 1 | 2.24337 | 2.718 | 0.106125 | 0.9040569 |
| 17 | 33 | 0 | 0 | 0 | 0 | 1 | 0.612847 | 2.718 | 0.5418406 | 0.6485755 |
| 18 | 42 | 1 | 0 | 1 | 0 | 1 | 0.102179 | 2.718 | 0.9028775 | 0.5255199 |
| 19 | 40 | 0 | 1 | 0 | 0 | 1 | -0.522294 | 2.718 | 1.6857994 | 0.3723286 |
| 20 | 31 | 0 | 1 | 0 | 0 | 1 | -0.066102 | 2.718 | 1.0683284 | 0.4834822 |
| 21 | 37 | 1 | 0 | 1 | 0 | 1 | 0.355619 | 2.718 | 0.7007654 | 0.5879706 |
| 22 | 52 | 0 | 1 | 0 | 1 | 1 | -1.134205 | 2.718 | 3.1083356 | 0.2434076 |
| 23 | 49 | 0 | 0 | 0 | 1 | 1 | -0.201816 | 2.718 | 1.2235972 | 0.4497217 |
| 24 | 38 | 1 | 0 | 0 | 1 | 1 | 1.530083 | 2.718 | 0.216552 | 0.8219952 |
| 25 | 41 | 0 | 1 | 0 | 0 | 1 | -0.572982 | 2.718 | 1.7734425 | 0.3605627 |
| 26 | 20 | 0 | 0 | 0 | 0 | 1 | 1.271791 | 2.718 | 0.2803661 | 0.7810266 |
| 27 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 28 | 32 | 1 | 1 | 0 | 1 | 1 | 1.053886 | 2.718 | 0.3486186 | 0.7414995 |
| 29 | 24 | 0 | 0 | 0 | 0 | 1 | 1.069039 | 2.718 | 0.3433764 | 0.744393 |
| 30 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |
| 31 | 19 | 0 | 0 | 0 | 0 | 1 | 1.322479 | 2.718 | 0.2665104 | 0.7895711 |
| 32 | 38 | 1 | 0 | 1 | 0 | 1 | 0.304931 | 2.718 | 0.7371975 | 0.5756398 |
| 33 | 46 | 0 | 0 | 0 | 0 | 1 | -0.046097 | 2.718 | 1.047171 | 0.488479 |
| 34 | 33 | 0 | 1 | 0 | 1 | 1 | -0.171133 | 2.718 | 1.1866275 | 0.4573253 |
| 35 | 23 | 1 | 1 | 0 | 0 | 1 | 1.513733 | 2.718 | 0.2201214 | 0.8195906 |
| 36 | 20 | 0 | 0 | 0 | 0 | 1 | 1.271791 | 2.718 | 0.2803661 | 0.7810266 |
| 37 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 38 | 26 | 1 | 0 | 1 | 0 | 1 | 0.913187 | 2.718 | 0.4012814 | 0.7136325 |
| 39 | 23 | 0 | 0 | 0 | 0 | 1 | 1.119727 | 2.718 | 0.3264068 | 0.7539165 |
| 40 | 21 | 0 | 0 | 0 | 0 | 1 | 1.221103 | 2.718 | 0.294942 | 0.7722353 |

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 41 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |
| 42 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |

**Appendix H (cont'd)**

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 43 | 20 | 0 | 0 | 0 | 0 | 1 | 1.271791 | 2.718 | 0.2803661 | 0.7810266 |
| 44 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |
| 45 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 46 | 27 | 0 | 0 | 0 | 0 | 1 | 0.916975 | 2.718 | 0.3997644 | 0.7144059 |
| 47 | 23 | 0 | 0 | 0 | 0 | 1 | 1.119727 | 2.718 | 0.3264068 | 0.7539165 |
| 48 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |
| 49 | 24 | 0 | 0 | 0 | 0 | 1 | 1.069039 | 2.718 | 0.3433764 | 0.744393 |
| 50 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |
| 51 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 52 | 17 | 1 | 0 | 0 | 0 | 1 | 2.598186 | 2.718 | 0.0744285 | 0.9307274 |
| 53 | 19 | 1 | 0 | 0 | 1 | 1 | 2.493155 | 2.718 | 0.0826702 | 0.9236423 |
| 54 | 25 | 0 | 1 | 0 | 0 | 1 | 0.238026 | 2.718 | 0.7882017 | 0.559221 |
| 55 | 18 | 1 | 0 | 0 | 0 | 1 | 2.547498 | 2.718 | 0.0782979 | 0.9273875 |
| 56 | 32 | 0 | 0 | 0 | 0 | 1 | 0.663535 | 2.718 | 0.5150629 | 0.6600386 |
| 57 | 26 | 1 | 1 | 0 | 0 | 1 | 1.361669 | 2.718 | 0.2562689 | 0.7960079 |
| 58 | 22 | 1 | 1 | 0 | 0 | 1 | 1.564421 | 2.718 | 0.209243 | 0.8269636 |
| 59 | 37 | 0 | 0 | 0 | 0 | 1 | 0.410095 | 2.718 | 0.6636154 | 0.6011005 |
| 60 | 33 | 0 | 1 | 0 | 0 | 1 | -0.167478 | 2.718 | 1.1822987 | 0.4582324 |
| 61 | 18 | 0 | 0 | 0 | 0 | 1 | 1.373167 | 2.718 | 0.2533395 | 0.7978684 |
| 62 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 63 | 27 | 1 | 0 | 0 | 0 | 1 | 2.091306 | 2.718 | 0.1235525 | 0.8900341 |
| 64 | 38 | 0 | 0 | 0 | 0 | 1 | 0.359407 | 2.718 | 0.6981162 | 0.5888879 |
| 65 | 31 | 0 | 1 | 0 | 0 | 1 | -0.066102 | 2.718 | 1.0683284 | 0.4834822 |
| 66 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 67 | 31 | 1 | 1 | 0 | 0 | 1 | 1.108229 | 2.718 | 0.3301811 | 0.7517774 |
| 68 | 16 | 1 | 0 | 0 | 0 | 1 | 2.648874 | 2.718 | 0.0707502 | 0.9339246 |
| 69 | 27 | 1 | 1 | 0 | 0 | 1 | 1.310981 | 2.718 | 0.2695921 | 0.7876545 |
| 70 | 32 | 0 | 1 | 0 | 1 | 1 | -0.120445 | 2.718 | 1.1279846 | 0.4699282 |
| 71 | 27 | 1 | 1 | 0 | 1 | 1 | 1.307326 | 2.718 | 0.2705792 | 0.7870426 |
| 72 | 23 | 0 | 0 | 0 | 0 | 1 | 1.119727 | 2.718 | 0.3264068 | 0.7539165 |
| 73 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 74 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 75 | 24 | 1 | 0 | 0 | 0 | 1 | 2.24337 | 2.718 | 0.106125 | 0.9040569 |
| 76 | 18 | 1 | 0 | 0 | 0 | 1 | 2.547498 | 2.718 | 0.0782979 | 0.9273875 |
| 77 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 78 | 18 | 1 | 0 | 0 | 0 | 1 | 2.547498 | 2.718 | 0.0782979 | 0.9273875 |
| 79 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 80 | 17 | 1 | 0 | 0 | 0 | 1 | 2.598186 | 2.718 | 0.0744285 | 0.9307274 |
| 81 | 19 | 1 | 0 | 0 | 1 | 1 | 2.493155 | 2.718 | 0.0826702 | 0.9236423 |
| 82 | 15 | 1 | 0 | 0 | 0 | 1 | 2.699562 | 2.718 | 0.0672538 | 0.9369843 |
| 83 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 84 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 85 | 21 | 0 | 1 | 0 | 0 | 1 | 0.440778 | 2.718 | 0.643565 | 0.6084335 |
| 86 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |

**Appendix H (cont'd)**

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 87 | 25 | 1 | 0 | 0 | 0 | 1 | 2.192682 | 2.718 | 0.1116424 | 0.8995699 |
| 88 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 89 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 90 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 91 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 92 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 93 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 94 | 15 | 1 | 0 | 0 | 0 | 1 | 2.699562 | 2.718 | 0.0672538 | 0.9369843 |
| 95 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 96 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 97 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 98 | 23 | 0 | 0 | 0 | 0 | 1 | 1.119727 | 2.718 | 0.3264068 | 0.7539165 |
| 99 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 100 | 16 | 1 | 0 | 0 | 0 | 1 | 2.648874 | 2.718 | 0.0707502 | 0.9339246 |
| 101 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 102 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 103 | 20 | 0 | 0 | 0 | 0 | 1 | 1.271791 | 2.718 | 0.2803661 | 0.7810266 |
| 104 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 105 | 26 | 0 | 0 | 0 | 0 | 1 | 0.967663 | 2.718 | 0.3800081 | 0.7246334 |
| 106 | 21 | 0 | 0 | 0 | 0 | 1 | 1.221103 | 2.718 | 0.294942 | 0.7722353 |
| 107 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |
| 108 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 109 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 110 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 111 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 112 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 113 | 21 | 0 | 0 | 0 | 0 | 1 | 1.221103 | 2.718 | 0.294942 | 0.7722353 |
| 114 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |
| 115 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |
| 116 | 24 | 1 | 1 | 0 | 0 | 1 | 1.463045 | 2.718 | 0.2315653 | 0.8119748 |
| 117 | 27 | 0 | 1 | 0 | 0 | 1 | 0.13665 | 2.718 | 0.8722878 | 0.5341059 |
| 118 | 23 | 0 | 0 | 0 | 0 | 1 | 1.119727 | 2.718 | 0.3264068 | 0.7539165 |
| 119 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 120 | 23 | 1 | 0 | 0 | 0 | 1 | 2.294058 | 2.718 | 0.1008803 | 0.9083639 |
| 121 | 25 | 1 | 1 | 0 | 0 | 1 | 1.412357 | 2.718 | 0.2436042 | 0.8041144 |
| 122 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |
| 123 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 124 | 20 | 0 | 1 | 0 | 0 | 1 | 0.491466 | 2.718 | 0.6117601 | 0.6204397 |
| 125 | 18 | 1 | 0 | 0 | 0 | 1 | 2.547498 | 2.718 | 0.0782979 | 0.9273875 |
| 126 | 38 | 1 | 0 | 1 | 1 | 1 | 0.301276 | 2.718 | 0.7398967 | 0.5747468 |
| 127 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 128 | 26 | 0 | 1 | 0 | 0 | 1 | 0.187338 | 2.718 | 0.8291795 | 0.5466932 |

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 129 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 130 | 29 | 0 | 0 | 0 | 1 | 1 | 0.811944 | 2.718 | 0.4440315 | 0.6925057 |

**Appendix H (cont'd)**

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 131 | 16 | 1 | 0 | 0 | 0 | 1 | 2.648874 | 2.718 | 0.0707502 | 0.9339246 |
| 132 | 31 | 1 | 0 | 0 | 0 | 1 | 1.888554 | 2.718 | 0.15132 | 0.8685682 |
| 133 | 27 | 0 | 0 | 0 | 0 | 1 | 0.916975 | 2.718 | 0.3997644 | 0.7144059 |
| 134 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 135 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 136 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 137 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 138 | 23 | 0 | 0 | 0 | 0 | 1 | 1.119727 | 2.718 | 0.3264068 | 0.7539165 |
| 139 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 140 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 141 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 142 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 143 | 28 | 1 | 0 | 0 | 1 | 1 | 2.036963 | 2.718 | 0.1304518 | 0.8846021 |
| 144 | 23 | 0 | 0 | 0 | 0 | 1 | 1.119727 | 2.718 | 0.3264068 | 0.7539165 |
| 145 | 23 | 1 | 0 | 0 | 0 | 1 | 2.294058 | 2.718 | 0.1008803 | 0.9083639 |
| 146 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 147 | 19 | 0 | 0 | 0 | 0 | 1 | 1.322479 | 2.718 | 0.2665104 | 0.7895711 |
| 148 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 149 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 150 | 21 | 1 | 1 | 0 | 0 | 1 | 1.615109 | 2.718 | 0.1989023 | 0.8340963 |
| 151 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 152 | 24 | 1 | 0 | 0 | 0 | 1 | 2.24337 | 2.718 | 0.106125 | 0.9040569 |
| 153 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 154 | 23 | 0 | 0 | 0 | 0 | 1 | 1.119727 | 2.718 | 0.3264068 | 0.7539165 |
| 155 | 15 | 1 | 0 | 0 | 0 | 1 | 2.699562 | 2.718 | 0.0672538 | 0.9369843 |
| 156 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 157 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 158 | 19 | 0 | 0 | 0 | 0 | 1 | 1.322479 | 2.718 | 0.2665104 | 0.7895711 |
| 159 | 23 | 1 | 0 | 0 | 0 | 1 | 2.294058 | 2.718 | 0.1008803 | 0.9083639 |
| 160 | 16 | 1 | 0 | 0 | 1 | 1 | 2.645219 | 2.718 | 0.0710093 | 0.9336987 |
| 161 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 162 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 163 | 26 | 1 | 1 | 0 | 0 | 1 | 1.361669 | 2.718 | 0.2562689 | 0.7960079 |
| 164 | 16 | 0 | 0 | 0 | 0 | 1 | 1.474543 | 2.718 | 0.2289183 | 0.8137237 |
| 165 | 20 | 0 | 0 | 0 | 0 | 1 | 1.271791 | 2.718 | 0.2803661 | 0.7810266 |
| 166 | 15 | 1 | 0 | 0 | 0 | 1 | 2.699562 | 2.718 | 0.0672538 | 0.9369843 |
| 167 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |
| 168 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 169 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 170 | 15 | 1 | 0 | 0 | 0 | 1 | 2.699562 | 2.718 | 0.0672538 | 0.9369843 |
| 171 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 172 | 29 | 1 | 0 | 0 | 0 | 1 | 1.98993 | 2.718 | 0.1367332 | 0.8797139 |

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 173 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 174 | 25 | 0 | 0 | 0 | 0 | 1 | 1.018351 | 2.718 | 0.3612282 | 0.7346307 |

**Appendix H (cont'd)**

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 175 | 20 | 0 | 1 | 0 | 1 | 1 | 0.487811 | 2.718 | 0.614 | 0.6195787 |
| 176 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 177 | 19 | 0 | 0 | 0 | 0 | 1 | 1.322479 | 2.718 | 0.2665104 | 0.7895711 |
| 178 | 17 | 0 | 0 | 0 | 0 | 1 | 1.423855 | 2.718 | 0.2408196 | 0.805919 |
| 179 | 18 | 1 | 1 | 0 | 0 | 1 | 1.767173 | 2.718 | 0.1708465 | 0.8540829 |
| 180 | 30 | 1 | 0 | 1 | 0 | 1 | 0.710435 | 2.718 | 0.4914666 | 0.670481 |
| 181 | 51 | 1 | 0 | 0 | 0 | 1 | 0.874794 | 2.718 | 0.4169857 | 0.7057234 |
| 182 | 16 | 1 | 0 | 0 | 0 | 1 | 2.648874 | 2.718 | 0.0707502 | 0.9339246 |
| 183 | 16 | 1 | 0 | 0 | 0 | 1 | 2.648874 | 2.718 | 0.0707502 | 0.9339246 |
| 184 | 18 | 0 | 1 | 0 | 0 | 1 | 0.592842 | 2.718 | 0.5527881 | 0.6440029 |
| 185 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 186 | 21 | 0 | 0 | 0 | 0 | 1 | 1.221103 | 2.718 | 0.294942 | 0.7722353 |
| 187 | 23 | 0 | 0 | 0 | 0 | 1 | 1.119727 | 2.718 | 0.3264068 | 0.7539165 |
| 188 | 24 | 0 | 0 | 0 | 0 | 1 | 1.069039 | 2.718 | 0.3433764 | 0.744393 |
| 189 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 190 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 191 | 20 | 0 | 0 | 0 | 0 | 1 | 1.271791 | 2.718 | 0.2803661 | 0.7810266 |
| 192 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 193 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 194 | 19 | 0 | 0 | 0 | 0 | 1 | 1.322479 | 2.718 | 0.2665104 | 0.7895711 |
| 195 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 196 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 197 | 17 | 0 | 0 | 0 | 0 | 1 | 1.423855 | 2.718 | 0.2408196 | 0.805919 |
| 198 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 199 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 200 | 22 | 0 | 1 | 0 | 1 | 1 | 0.386435 | 2.718 | 0.6795021 | 0.5954146 |
| 201 | 21 | 0 | 0 | 0 | 0 | 1 | 1.221103 | 2.718 | 0.294942 | 0.7722353 |
| 202 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 203 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 204 | 24 | 1 | 1 | 0 | 0 | 1 | 1.463045 | 2.718 | 0.2315653 | 0.8119748 |
| 205 | 27 | 1 | 0 | 0 | 0 | 1 | 2.091306 | 2.718 | 0.1235525 | 0.8900341 |
| 206 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 207 | 18 | 1 | 0 | 0 | 0 | 1 | 2.547498 | 2.718 | 0.0782979 | 0.9273875 |
| 208 | 18 | 1 | 0 | 0 | 0 | 1 | 2.547498 | 2.718 | 0.0782979 | 0.9273875 |
| 209 | 17 | 1 | 0 | 0 | 0 | 1 | 2.598186 | 2.718 | 0.0744285 | 0.9307274 |
| 210 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |
| 211 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 212 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 213 | 19 | 0 | 0 | 0 | 0 | 1 | 1.322479 | 2.718 | 0.2665104 | 0.7895711 |
| 214 | 18 | 1 | 0 | 0 | 0 | 1 | 2.547498 | 2.718 | 0.0782979 | 0.9273875 |
| 215 | 17 | 1 | 0 | 0 | 0 | 1 | 2.598186 | 2.718 | 0.0744285 | 0.9307274 |
| 216 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 217 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 218 | 27 | 1 | 1 | 0 | 0 | 1 | 1.310981 | 2.718 | 0.2695921 | 0.7876545 |

**Appendix H (cont'd)**

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 219 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 220 | 40 | 1 | 0 | 1 | 0 | 1 | 0.203555 | 2.718 | 0.8158426 | 0.5507085 |
| 221 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 222 | 18 | 1 | 0 | 0 | 0 | 1 | 2.547498 | 2.718 | 0.0782979 | 0.9273875 |
| 223 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 224 | 18 | 1 | 0 | 0 | 0 | 1 | 2.547498 | 2.718 | 0.0782979 | 0.9273875 |
| 225 | 19 | 0 | 0 | 0 | 0 | 1 | 1.322479 | 2.718 | 0.2665104 | 0.7895711 |
| 226 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 227 | 18 | 1 | 0 | 0 | 0 | 1 | 2.547498 | 2.718 | 0.0782979 | 0.9273875 |
| 228 | 22 | 0 | 0 | 0 | 0 | 1 | 1.170415 | 2.718 | 0.3102758 | 0.7631981 |
| 229 | 23 | 1 | 0 | 0 | 0 | 1 | 2.294058 | 2.718 | 0.1008803 | 0.9083639 |
| 230 | 50 | 1 | 0 | 0 | 0 | 1 | 0.925482 | 2.718 | 0.3963784 | 0.7161383 |
| 231 | 25 | 1 | 1 | 0 | 0 | 1 | 1.412357 | 2.718 | 0.2436042 | 0.8041144 |
| 232 | 21 | 0 | 0 | 0 | 0 | 1 | 1.221103 | 2.718 | 0.294942 | 0.7722353 |
| 233 | 21 | 0 | 0 | 0 | 0 | 1 | 1.221103 | 2.718 | 0.294942 | 0.7722353 |
| 234 | 20 | 0 | 0 | 0 | 0 | 1 | 1.271791 | 2.718 | 0.2803661 | 0.7810266 |
| 235 | 21 | 0 | 0 | 0 | 0 | 1 | 1.221103 | 2.718 | 0.294942 | 0.7722353 |
| 236 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 237 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 238 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 239 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 240 | 18 | 1 | 0 | 0 | 0 | 1 | 2.547498 | 2.718 | 0.0782979 | 0.9273875 |
| 241 | 19 | 0 | 0 | 0 | 0 | 1 | 1.322479 | 2.718 | 0.2665104 | 0.7895711 |
| 242 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 243 | 19 | 0 | 0 | 0 | 0 | 1 | 1.322479 | 2.718 | 0.2665104 | 0.7895711 |
| 244 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 245 | 20 | 0 | 0 | 0 | 0 | 1 | 1.271791 | 2.718 | 0.2803661 | 0.7810266 |
| 246 | 30 | 1 | 0 | 1 | 0 | 1 | 0.710435 | 2.718 | 0.4914666 | 0.670481 |
| 247 | 21 | 0 | 0 | 0 | 0 | 1 | 1.221103 | 2.718 | 0.294942 | 0.7722353 |
| 248 | 23 | 0 | 0 | 0 | 0 | 1 | 1.119727 | 2.718 | 0.3264068 | 0.7539165 |
| 249 | 19 | 0 | 0 | 0 | 0 | 1 | 1.322479 | 2.718 | 0.2665104 | 0.7895711 |
| 250 | 20 | 0 | 0 | 0 | 0 | 1 | 1.271791 | 2.718 | 0.2803661 | 0.7810266 |
| 251 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 252 | 17 | 0 | 0 | 0 | 0 | 1 | 1.423855 | 2.718 | 0.2408196 | 0.805919 |
| 253 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 254 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 255 | 30 | 0 | 1 | 0 | 0 | 1 | -0.015414 | 2.718 | 1.0155318 | 0.496147 |
| 256 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 257 | 22 | 1 | 1 | 0 | 0 | 1 | 1.564421 | 2.718 | 0.209243 | 0.8269636 |
| 258 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 259 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 260 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 261 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 262 | 20 | 0 | 0 | 0 | 0 | 1 | 1.271791 | 2.718 | 0.2803661 | 0.7810266 |

**Appendix H (cont'd)**

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 263 | 21 | 0 | 0 | 0 | 0 | 1 | 1.221103 | 2.718 | 0.294942 | 0.7722353 |
| 264 | 20 | 0 | 0 | 0 | 0 | 1 | 1.271791 | 2.718 | 0.2803661 | 0.7810266 |
| 265 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 266 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 267 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 268 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 269 | 21 | 0 | 0 | 0 | 0 | 1 | 1.221103 | 2.718 | 0.294942 | 0.7722353 |
| 270 | 23 | 1 | 0 | 0 | 0 | 1 | 2.294058 | 2.718 | 0.1008803 | 0.9083639 |
| 271 | 21 | 0 | 0 | 0 | 0 | 1 | 1.221103 | 2.718 | 0.294942 | 0.7722353 |
| 272 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 273 | 38 | 1 | 1 | 0 | 1 | 1 | 0.749758 | 2.718 | 0.4725176 | 0.679109 |
| 274 | 35 | 1 | 0 | 0 | 1 | 1 | 1.682147 | 2.718 | 0.1860067 | 0.8431656 |
| 275 | 30 | 1 | 0 | 0 | 0 | 1 | 1.939242 | 2.718 | 0.1438418 | 0.8742467 |
| 276 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 277 | 35 | 1 | 1 | 0 | 0 | 1 | 0.905477 | 2.718 | 0.4043869 | 0.7120545 |
| 278 | 19 | 0 | 0 | 0 | 0 | 1 | 1.322479 | 2.718 | 0.2665104 | 0.7895711 |
| 279 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 280 | 26 | 1 | 0 | 0 | 0 | 1 | 2.141994 | 2.718 | 0.1174466 | 0.8948974 |
| 281 | 23 | 0 | 0 | 0 | 0 | 1 | 1.119727 | 2.718 | 0.3264068 | 0.7539165 |
| 282 | 27 | 0 | 1 | 0 | 1 | 1 | 0.132995 | 2.718 | 0.8754815 | 0.5331964 |
| 283 | 18 | 1 | 0 | 0 | 0 | 1 | 2.547498 | 2.718 | 0.0782979 | 0.9273875 |
| 284 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 285 | 29 | 1 | 1 | 0 | 0 | 1 | 1.209605 | 2.718 | 0.2983525 | 0.7702069 |
| 286 | 44 | 0 | 0 | 0 | 1 | 1 | 0.051624 | 2.718 | 0.949691 | 0.5129018 |
| 287 | 32 | 1 | 0 | 1 | 0 | 1 | 0.609059 | 2.718 | 0.5438967 | 0.6477117 |
| 288 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 289 | 21 | 1 | 0 | 0 | 0 | 1 | 2.395434 | 2.718 | 0.0911558 | 0.9164594 |
| 290 | 19 | 1 | 0 | 0 | 0 | 1 | 2.49681 | 2.718 | 0.0823686 | 0.9238997 |
| 291 | 17 | 1 | 0 | 0 | 0 | 1 | 2.598186 | 2.718 | 0.0744285 | 0.9307274 |
| 292 | 19 | 0 | 0 | 0 | 0 | 1 | 1.322479 | 2.718 | 0.2665104 | 0.7895711 |
| 293 | 22 | 1 | 0 | 0 | 0 | 1 | 2.344746 | 2.718 | 0.0958949 | 0.9124963 |
| 294 | 23 | 1 | 0 | 0 | 0 | 1 | 2.294058 | 2.718 | 0.1008803 | 0.9083639 |
| 295 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 296 | 26 | 1 | 1 | 0 | 0 | 1 | 1.361669 | 2.718 | 0.2562689 | 0.7960079 |
| 297 | 34 | 0 | 0 | 0 | 1 | 1 | 0.558504 | 2.718 | 0.5720974 | 0.6360929 |
| 298 | 29 | 1 | 1 | 0 | 0 | 1 | 1.209605 | 2.718 | 0.2983525 | 0.7702069 |
| 299 | 20 | 1 | 0 | 0 | 0 | 1 | 2.446122 | 2.718 | 0.0866509 | 0.9202588 |
| 300 | 24 | 1 | 1 | 0 | 0 | 1 | 1.463045 | 2.718 | 0.2315653 | 0.8119748 |
| 301 | 29 | 1 | 0 | 0 | 1 | 0 | -0.034915 | 2.718 | 1.0355279 | 0.491273 |
| 302 | 27 | 1 | 0 | 0 | 1 | 0 | 0.066461 | 2.718 | 0.9357059 | 0.5166074 |
| 303 | 30 | 0 | 0 | 0 | 0 | 0 | -1.256279 | 2.718 | 3.5118703 | 0.2216376 |
| 304 | 31 | 0 | 0 | 0 | 0 | 0 | -1.306967 | 2.718 | 3.6944492 | 0.2130175 |

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 305 | 21 | 0 | 1 | 0 | 0 | 0 | -1.580412 | 2.718 | 4.8561607 | 0.1707603 |
| 306 | 40 | 0 | 0 | 0 | 0 | 0 | -1.763159 | 2.718 | 5.8297621 | 0.146418 |

**Appendix H (cont'd)**

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 307 | 33 | 1 | 0 | 0 | 0 | 0 | -0.234012 | 2.718 | 1.263629 | 0.4417685 |
| 308 | 32 | 0 | 0 | 0 | 1 | 0 | -1.36131 | 2.718 | 3.90075 | 0.2040504 |
| 309 | 42 | 0 | 0 | 0 | 0 | 0 | -1.864535 | 2.718 | 6.4516872 | 0.1341978 |
| 310 | 30 | 1 | 1 | 0 | 1 | 0 | -0.865928 | 2.718 | 2.3769977 | 0.296121 |
| 311 | 31 | 1 | 0 | 0 | 0 | 0 | -0.132636 | 2.718 | 1.1418186 | 0.4668929 |
| 312 | 36 | 0 | 1 | 0 | 0 | 0 | -2.340732 | 2.718 | 10.386317 | 0.0878247 |
| 313 | 28 | 0 | 0 | 0 | 0 | 0 | -1.154903 | 2.718 | 3.1733355 | 0.2396165 |
| 314 | 36 | 0 | 0 | 0 | 0 | 0 | -1.560407 | 2.718 | 4.7599883 | 0.1736115 |
| 315 | 20 | 0 | 1 | 0 | 0 | 0 | -1.529724 | 2.718 | 4.6161702 | 0.1780573 |
| 316 | 18 | 0 | 0 | 0 | 0 | 0 | -0.648023 | 2.718 | 1.9116291 | 0.3434503 |
| 317 | 28 | 1 | 0 | 0 | 1 | 0 | 0.015773 | 2.718 | 0.9843524 | 0.5039428 |
| 318 | 34 | 1 | 1 | 0 | 0 | 0 | -1.065025 | 2.718 | 2.9005912 | 0.2563714 |
| 319 | 20 | 0 | 0 | 0 | 0 | 0 | -0.749399 | 2.718 | 2.1155637 | 0.3209692 |
| 320 | 35 | 1 | 1 | 0 | 0 | 0 | -1.115713 | 2.718 | 3.0513903 | 0.2468288 |
| 321 | 26 | 0 | 0 | 0 | 1 | 0 | -1.057182 | 2.718 | 2.8779332 | 0.2578693 |
| 322 | 22 | 1 | 1 | 0 | 0 | 0 | -0.456769 | 2.718 | 1.5788893 | 0.3877638 |
| 323 | 30 | 0 | 1 | 0 | 1 | 0 | -2.040259 | 2.718 | 7.6909742 | 0.1150619 |
| 324 | 27 | 1 | 0 | 0 | 1 | 0 | 0.066461 | 2.718 | 0.9357059 | 0.5166074 |
| 325 | 18 | 0 | 1 | 0 | 1 | 0 | -1.432003 | 2.718 | 4.1864559 | 0.1928099 |
| 326 | 17 | 1 | 0 | 0 | 0 | 0 | 0.576996 | 2.718 | 0.5616164 | 0.6403621 |
| 327 | 42 | 0 | 0 | 0 | 1 | 0 | -1.86819 | 2.718 | 6.4753088 | 0.1337737 |
| 328 | 41 | 0 | 0 | 0 | 0 | 0 | -1.813847 | 2.718 | 6.1328461 | 0.1401965 |
| 329 | 26 | 0 | 1 | 0 | 0 | 0 | -1.833852 | 2.718 | 6.2567561 | 0.1378026 |
| 330 | 24 | 0 | 0 | 1 | 1 | 0 | -2.184613 | 2.718 | 8.8851957 | 0.1011614 |
| 331 | 30 | 0 | 0 | 0 | 1 | 0 | -1.259934 | 2.718 | 3.5247283 | 0.2210077 |
| 332 | 37 | 1 | 1 | 0 | 0 | 0 | -1.217089 | 2.718 | 3.3769158 | 0.2284714 |
| 333 | 25 | 0 | 0 | 1 | 1 | 0 | -2.235301 | 2.718 | 9.347129 | 0.0966452 |
| 334 | 24 | 1 | 1 | 0 | 1 | 0 | -0.5618 | 2.718 | 1.7537244 | 0.3631445 |
| 335 | 22 | 0 | 0 | 0 | 0 | 0 | -0.850775 | 2.718 | 2.3412542 | 0.2992888 |
| 336 | 35 | 0 | 1 | 0 | 1 | 0 | -2.293699 | 2.718 | 9.9091758 | 0.091666 |
| 337 | 30 | 1 | 1 | 0 | 0 | 0 | -0.862273 | 2.718 | 2.3683265 | 0.2968833 |
| 338 | 25 | 0 | 0 | 0 | 0 | 0 | -1.002839 | 2.718 | 2.7257266 | 0.268404 |
| 339 | 43 | 1 | 0 | 0 | 1 | 0 | -0.744547 | 2.718 | 2.1053249 | 0.3220275 |
| 340 | 35 | 0 | 0 | 0 | 1 | 0 | -1.513374 | 2.718 | 4.5413171 | 0.1804625 |
| 341 | 24 | 1 | 0 | 1 | 0 | 0 | -1.006627 | 2.718 | 2.7360701 | 0.2676609 |
| 342 | 26 | 0 | 0 | 0 | 0 | 0 | -1.053527 | 2.718 | 2.8674346 | 0.2585693 |
| 343 | 24 | 1 | 0 | 0 | 0 | 0 | 0.22218 | 2.718 | 0.8007897 | 0.5553119 |
| 344 | 42 | 0 | 1 | 0 | 1 | 0 | -2.648515 | 2.718 | 14.129155 | 0.0660975 |
| 345 | 30 | 0 | 1 | 0 | 0 | 0 | -2.036604 | 2.718 | 7.6629179 | 0.1154345 |
| 346 | 35 | 1 | 1 | 0 | 1 | 0 | -1.119368 | 2.718 | 3.0625624 | 0.2461501 |
| 347 | 23 | 0 | 0 | 0 | 0 | 0 | -0.901463 | 2.718 | 2.4629739 | 0.2887691 |
| 348 | 45 | 0 | 1 | 0 | 0 | 0 | -2.796924 | 2.718 | 16.389387 | 0.0575063 |

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 349 | 21 | 0 | 0 | 1 | 1 | 0 | -2.032549 | 2.718 | 7.6319109 | 0.1158492 |
| 350 | 23 | 1 | 1 | 0 | 1 | 0 | -0.511112 | 2.718 | 1.6670557 | 0.3749453 |

**Appendix H (cont'd)**

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 351 | 24 | 1 | 0 | 0 | 0 | 0 | 0.22218 | 2.718 | 0.8007897 | 0.5553119 |
| 352 | 38 | 1 | 0 | 0 | 0 | 0 | -0.487452 | 2.718 | 1.6280801 | 0.3805059 |
| 353 | 35 | 0 | 0 | 0 | 0 | 0 | -1.509719 | 2.718 | 4.5247506 | 0.1810036 |
| 354 | 29 | 1 | 0 | 0 | 0 | 0 | -0.03126 | 2.718 | 1.0317504 | 0.4921864 |
| 355 | 25 | 1 | 1 | 0 | 1 | 0 | -0.612488 | 2.718 | 1.8448989 | 0.3515063 |
| 356 | 23 | 1 | 0 | 0 | 0 | 0 | 0.272868 | 2.718 | 0.7612148 | 0.5677899 |
| 357 | 34 | 1 | 1 | 0 | 1 | 0 | -1.06868 | 2.718 | 2.9112111 | 0.2556753 |
| 358 | 22 | 1 | 0 | 0 | 0 | 0 | 0.323556 | 2.718 | 0.7235957 | 0.5801825 |
| 359 | 19 | 0 | 0 | 0 | 0 | 0 | -0.698711 | 2.718 | 2.011013 | 0.3321141 |
| 360 | 21 | 1 | 0 | 0 | 0 | 0 | 0.374244 | 2.718 | 0.6878358 | 0.5924747 |
| 361 | 20 | 1 | 0 | 0 | 0 | 0 | 0.424932 | 2.718 | 0.653843 | 0.6046523 |
| 362 | 37 | 1 | 0 | 0 | 0 | 0 | -0.436764 | 2.718 | 1.5476207 | 0.3925231 |
| 363 | 34 | 1 | 0 | 1 | 0 | 0 | -1.513507 | 2.718 | 4.5419211 | 0.1804428 |
| 364 | 48 | 0 | 0 | 0 | 0 | 0 | -2.168663 | 2.718 | 8.7446155 | 0.1026208 |
| 365 | 26 | 0 | 0 | 0 | 0 | 0 | -1.053527 | 2.718 | 2.8674346 | 0.2585693 |
| 366 | 43 | 0 | 0 | 0 | 4 | 0 | -1.929843 | 2.718 | 6.8870505 | 0.1267901 |
| 367 | 18 | 1 | 0 | 0 | 0 | 0 | 0.526308 | 2.718 | 0.5908144 | 0.6286089 |
| 368 | 19 | 1 | 0 | 0 | 0 | 0 | 0.47562 | 2.718 | 0.6215303 | 0.6167014 |
| 369 | 25 | 1 | 0 | 0 | 0 | 0 | 0.171492 | 2.718 | 0.842422 | 0.5427638 |
| 370 | 28 | 1 | 0 | 0 | 0 | 0 | 0.019428 | 2.718 | 0.9807615 | 0.5048563 |
| 371 | 24 | 1 | 1 | 0 | 0 | 0 | -0.558145 | 2.718 | 1.7473269 | 0.3639902 |
| 372 | 22 | 0 | 0 | 0 | 0 | 0 | -0.850775 | 2.718 | 2.3412542 | 0.2992888 |
| 373 | 21 | 1 | 0 | 0 | 0 | 0 | 0.374244 | 2.718 | 0.6878358 | 0.5924747 |
| 374 | 25 | 1 | 0 | 0 | 0 | 0 | 0.171492 | 2.718 | 0.842422 | 0.5427638 |
| 375 | 29 | 1 | 1 | 0 | 1 | 0 | -0.81524 | 2.718 | 2.2595269 | 0.306793 |
| 376 | 30 | 1 | 1 | 0 | 1 | 0 | -0.865928 | 2.718 | 2.3769977 | 0.296121 |
| 377 | 39 | 0 | 0 | 0 | 0 | 0 | -1.712471 | 2.718 | 5.5416564 | 0.1528665 |
| 378 | 19 | 1 | 0 | 0 | 0 | 0 | 0.47562 | 2.718 | 0.6215303 | 0.6167014 |
| 379 | 46 | 1 | 0 | 0 | 0 | 0 | -0.892956 | 2.718 | 2.4421124 | 0.2905193 |
| 380 | 37 | 1 | 0 | 0 | 0 | 0 | -0.436764 | 2.718 | 1.5476207 | 0.3925231 |
| 381 | 32 | 1 | 0 | 0 | 0 | 0 | -0.183324 | 2.718 | 1.2011807 | 0.4543016 |
| 382 | 26 | 0 | 0 | 0 | 0 | 0 | -1.053527 | 2.718 | 2.8674346 | 0.2585693 |
| 383 | 23 | 0 | 0 | 0 | 1 | 0 | -0.905118 | 2.718 | 2.4719916 | 0.2880191 |
| 384 | 34 | 1 | 0 | 0 | 0 | 0 | -0.2847 | 2.718 | 1.3293239 | 0.4293091 |
| 385 | 26 | 0 | 0 | 0 | 1 | 0 | -1.057182 | 2.718 | 2.8779332 | 0.2578693 |
| 386 | 19 | 0 | 0 | 0 | 1 | 0 | -0.702366 | 2.718 | 2.0183759 | 0.331304 |
| 387 | 21 | 1 | 1 | 0 | 0 | 0 | -0.406081 | 2.718 | 1.5008609 | 0.3998623 |
| 388 | 32 | 1 | 0 | 0 | 0 | 0 | -0.183324 | 2.718 | 1.2011807 | 0.4543016 |
| 389 | 45 | 0 | 0 | 1 | 1 | 0 | -3.249061 | 2.718 | 25.757456 | 0.0373728 |
| 390 | 27 | 1 | 1 | 0 | 0 | 0 | -0.710209 | 2.718 | 2.0342666 | 0.3295689 |
| 391 | 26 | 1 | 0 | 0 | 0 | 0 | 0.120804 | 2.718 | 0.8862187 | 0.5301612 |
| 392 | 20 | 1 | 0 | 0 | 0 | 0 | 0.424932 | 2.718 | 0.653843 | 0.6046523 |

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 393 | 31 | 1 | 0 | 0 | 1 | 0 | -0.136291 | 2.718 | 1.1459991 | 0.4659834 |
| 394 | 18 | 1 | 1 | 0 | 1 | 0 | -0.257672 | 2.718 | 1.2938798 | 0.4359426 |

**Appendix H (cont'd)**

| No. of Respondent | age | sex | Pri | Hwf | DInc4 | u (loc) | $z_i$ | $e$ | $e^{-z_i}$ | $P_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 395 | 43 | 0 | 1 | 0 | 0 | 0 | -2.695548 | 2.718 | 14.809495 | 0.0632531 |
| 396 | 28 | 1 | 0 | 0 | 0 | 0 | 0.019428 | 2.718 | 0.9807615 | 0.5048563 |
| 397 | 33 | 1 | 0 | 0 | 0 | 0 | -0.234012 | 2.718 | 1.263629 | 0.4417685 |
| 398 | 26 | 1 | 0 | 1 | 1 | 0 | -1.111658 | 2.718 | 3.0390432 | 0.2475834 |
| 399 | 28 | 1 | 1 | 0 | 0 | 0 | -0.760897 | 2.718 | 2.1400263 | 0.3184687 |
| 400 | 33 | 1 | 0 | 0 | 0 | 0 | -0.234012 | 2.718 | 1.263629 | 0.4417685 |
| | | | | | | | | | $P_i$ | 0.6981077 |
| | | | | | | | | | $1 - P_i$ | 0.3018923 |
| | | | | | | | | | Probability1 | -0.01069 |
| | | | | | | | | | Probability2 | 0.2475 |
| | | | | | | | | | Probability3 | -0.1645 |
| | | | | | | | | | Probability4 | -0.2590 |
| | | | | | | | | | Probability5 | -0.00077 |
| | | | | | | | | | Probability6 | 0.4257 |

Remark of variables:
1) Age(years)          Hwf       : Housewives
2) Sex                   Dinc4: Income4 (Rp.1.5000.000-2.000.000)
3) Pri          : Private officials          U(loc)  : Location (urban and sub-urban)

**Appendix I**

Result of coefficient variables of binary logistic model.

From:

$$P_i = \frac{1}{1+ e^{-z_i}}$$

given $P_{i=} F (\alpha_0 + \beta_0 X_j)$ , $\alpha_0, \beta_0$ parameter more than zero (0)

Therefore, $F(x) = \frac{1}{1+ e^{-z_i}}$

$$\frac{dPi}{dXi} = \beta_0 F'(\alpha_0 + \beta_0 X_j)$$

$$F' = \frac{e^{-z_i}}{(1 + e^{-z_i})^2} = \frac{1 + e^{-z_i}}{(1 + e^{-z_i})^2} - \frac{1}{(1 + e^{-z_i})^2}$$

$$= \frac{1}{1 + e^{-z_i}} - \frac{1}{(1 + e^{-z_i})^2}$$

$$= F(x) - F^2(x) = F(x) * (1 - F(x)) = P_i * (1 - P_i)$$

Therefore,

$$\frac{dP_i}{dX_i} = \beta_0 F'(\alpha_0 + \beta_o X_j) = \beta_0(P_i * (1 - P_i))$$

$$z_{i=} 0.264361 - 0.050688 Age_i + 1.174331 Sex_i - 0.780325 Occ2_i - 1.228807 Occ4_i$$
$$- 0.003655 Inc4_i + 2.020119 \, Loc_i$$

$e = 2.718$

Therefore,

(1) If the consumers' age increase, the probability of purchasing decision towards yogurt will decrease as much as 0.01069

= (0.050688) * $P_i$ mean* $(1 - P_i)$ mean

= (0.050688) * 0.698108 *0.301892

=  0.01068659

=  0.01069  with negative sign

(2) If one person female consumers' will increase probability of purchasing decision towards yogurt 0.2475.

$= (1.174331) * P_i$ mean$* (1 - P_i)$ mean

$= (1.174331) * 0.698108 *0.301892$

$= 0.247494039$

$= 0.2475$

(3) If one buyer of private official consumer's will decrease the probability of purchasing decision towards yogurt 0.1645

$= (0.780325) * P_i$ mean $* (1 - P_i)$ mean

$= (0.780325) * 0.698108 *0.301892$

$= 0.16445600$

$= 0.1645$ with negative sign

(4) If one buyer of housewife consumer's will decrease the probability of purchasing decision towards yogurt 0.02590

$= (1.228807) * P_i$ mean $* (1 - P_i)$ mean

$= (1.228807) * 0.698108 *0.301892$

$= 0.25897503$

$= 0.2590$ with negative sign

(5) If one consumers with range of income level increase one buyer, the probability of purchasing decision towards yogurt will decrease 0.00077

$= (0.003655) * P_i$ mean$* (1 - P_i)$ mean

$= (0.003655) * 0.698108 *0.301892$

$= 0.00077030$

$= 0.00077$ with negative sign

(6) If consumer of urban area increases, then the probability of purchasing decision towards yogurt will increase 0.4257

$= (2.020119) * P_i$ mean$* (1 - P_i)$ mean

$= (2.020119) * 0.698108 *0.301892$

$= 0.42574658$

$= 0.4257$

# VITAE

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