



UNIVERSITI
MALAYSIA
KELANTAN

Consumption pattern of milk and dairy products among different income levels in rural, town, and city areas of Sabah, Malaysia during Covid-19 outbreaks

**Nurfa Shahirah Seriger Binti Mohd Jendi Seriger
F18A0169**

A thesis submitted in fulfilment of the requirements for the degree Bachelor of Applied Science (Animal Husbandary) With Honours

**Faculty of Agro-Based Industry
University Malaysia Kelantan**

2022

DECLARATION

I hereby declare that the work embodied in this report is the result of my own research except for the excerpt as cited in the references.



Signature

Student's Name: Nurfa Shahirah Seriger Binti Mohd Jendi Seriger

Matric Number: F18A0169

Date: 19/02/2022

Verified by:

Supervisor's Signature

Supervisor's Name: Dr. Mohammad Mijanur Rahman

Stamp:

Date:

ACKNOWLEDGEMENT

All praises to Allah for His blessings on me in finishing this thesis, Alhamdulillah. In the first place, I'd want to convey my appreciation to everyone who has assisted me in finishing my final-year project successfully. My thanks also go to the Faculty of Agro-Based Industry (FIAT) for providing and coordinating a final year project for all final year students, which I much appreciate.

I would want to convey my heartfelt gratitude to my supervisor, Dr Mohammad Mijanur Rahman, for helping me through the whole process of conducting my research survey, from the very beginning. While dealing with this social sciences study, he also provided me with some valuable lessons, motivations, thoughts, and facts.

I would want to express my heartfelt gratitude to my friends and family for their encouragement and enthusiasm in helping me accomplish my study, despite the fact that the time allotted for completion of this project is restricted. Thank you also to my project colleagues for their assistance in completing this survey as a group.

Finally, I'd want to express my gratitude to everyone who contributed to the completion of my thesis. Hopefully, my social science research may be used as a resource for others, and please wish me the best of success in the future.

Consumption pattern of milk and dairy products among different income levels in rural, town, and city areas of Sabah, Malaysia during Covid-19 outbreaks

ABSTRACT

Increasing consumer standards of living, which are regarded to be elements influencing changing lifestyles and global patterns in consumption, are driving the growing transformation of the food industry. Milk and dairy products are meals that are well-known for their pleasant taste as well as their high nutritional content. During the Covid-19 outbreak, there were numerous shortages of dairy goods on the shelves of grocery stores. This study investigated the patterns of milk and dairy product consumption among different socioeconomic levels in a number of chosen areas in Sabah. The consumption and expenditure behavioural of milk and dairy products during Covid-19 outbreaks also identified. The samples of household income were classified into 5 groups (<RM2000, RM2001-RM3000, RM3001-RM4000, RM4001-RM5000, and >RM5000). The data were collected in three different areas in Sabah, Malaysia, comprising 16 from the rural areas, 25 from town area, and 23 from city area aged 16 to 60 years. The complete data were analysed using the IBM, Statistical Package for Social Sciences (SPSS) version 26. Among milk and dairy products, this study showed that there was a significant relationship between consumption of fresh milk with household income levels. The major allocation of expenditure was devoted to powder/formula milk, followed by ice cream, and fresh milk and other dairy products. Most of the respondents had reduced their consumption and expenditure behavioural during Covid-19 outbreaks. Additionally, this study indicates that individuals of the city areas consumed more milk and dairy products, and when the income of family members rises, the consumption of milk and dairy products will rise as well.

Keywords: *Milk and dairy product consumption, Household income, Areas, Consumption and expenditure behavioural, Covid-19 outbreaks.*

Corak penggunaan susu dan produk susu dalam kalangan tahap pendapatan yang berbeza di kawasan luar bandar, bandar dan bandar di Sabah, Malaysia semasa wabak

Covid-19

ABSTRAK

Peningkatan taraf hidup pengguna, yang dianggap sebagai elemen yang mempengaruhi perubahan gaya hidup dan corak penggunaan global, memacu transformasi industri makanan yang semakin meningkat. Susu dan produk tenusu adalah makanan yang terkenal dengan rasa yang enak serta kandungan nutrisi yang tinggi. Semasa wabak Covid-19, terdapat banyak kekurangan barangan tenusu di rak kedai runcit. Kajian ini menyiasat corak penggunaan susu dan produk tenusu di kalangan tahap sosioekonomi yang berbeza di beberapa kawasan terpilih di Sabah. Penggunaan dan perbelanjaan tingkah laku susu dan susu tenusu semasa wabak Covid-19 juga dikenal pasti. Sampel pendapatan isi rumah dikelaskan kepada 5 kumpulan (<RM2000, RM2000-RM3000, RM3000-RM4000, RM4000-RM5000, dan> RM5000). Data dikumpul di tiga kawasan berbeza di Sabah, Malaysia, terdiri daripada 16 dari kawasan luar bandar, 25 dari kawasan bandar, dan 23 dari kawasan bandar berumur 16 hingga 60 tahun. Data lengkap dianalisis menggunakan IBM, Statistical Package for Social Sciences (SPSS) versi 26. Antara susu dan produk tenusu, kajian ini menunjukkan terdapat hubungan yang signifikan antara pengambilan susu segar dengan tahap pendapatan isi rumah. Peruntukan utama perbelanjaan ditumpukan kepada susu tepung/formula, diikuti dengan aiskrim dan susu segar dan produk tenusu lain. Kebanyakan responden mengurangkan perbelanjaan penggunaan dan tingkah laku mereka semasa wabak Covid-19. Selain itu, kajian ini menunjukkan bahawa individu di kawasan bandar mengambil lebih banyak susu dan produk tenusu, dan apabila pendapatan ahli keluarga meningkat, penggunaan susu dan produk tenusu juga akan meningkat..

Kata kunci: Pengambilan susu dan produk tenusu, Pendapatan isi rumah, Kawasan, Penggunaan dan perbelanjaan tingkah laku, wabak Covid-19.

MALAYSIA

KELANTAN

TABLE OF CONTENTS

CONTENTS	PAGE
DECLARATION	i
ACKNOWLEDGEMENT	ii
ABDTRACT	iii
ABSTRAK	iv
TABLE OF CONTENTS	v-vii
LIST OF FIGURE	viii-ix
LIST OF TABLE	ix
CHAPTER 1 INTRODUCTION	1-8
1.0 Introduction	
1.1 Background of study	
1.2 Problem statement	
1.3 Hypothesis of the study	
1.4 Research questions	
1.5 Scope of study	
1.6 Significant of study	
1.7 Research objective	
CHAPTER 2 LITERATURE REVIEW	9-15
2.0 Concept of consumption pattern of milk and dairy product	
2.1 Factor influence consumption pattern of milk and dairy products	
2.1.1 Household size	
2.1.2 Income level	
2.1.3 Prices	
2.1.4 Food habits and social custom	
2.2 Health effect of milk and dairy products	
CHAPTER 3 METHODOLOGY	16-20
3.0 Methodology	
3.1 Research design	
3.2 Arrangements	
3.3 Overview on population and sample	
3.4 Data exploration and analysis	
CHAPTER 4 RESULT AND DISCUSSION	21-74
4.0 Result and discussion	
4.1 Demographic profile	

- 4.1.1 Distribution of gender type
- 4.1.2 Distribution of respondent's location
- 4.1.3 Distribution of household income
- 4.1.4 Distribution of education level
- 4.2 Milk and dairy products brand
 - 4.2.1 Distribution of liquid/evaporated milk brand
 - 4.2.2 Distribution of condensed milk brand
 - 4.2.3 Distribution of fresh milk brand
 - 4.2.4 Distribution of powder/formula milk brand
 - 4.2.5 Distribution of sweetmeats brand
 - 4.2.6 Distribution of yogurt brand
 - 4.2.7 Distribution of butter brand
 - 4.2.8 Distribution of ice cream brand
- 4.3 Total consumption group of milk and dairy products
 - 4.3.1 Distribution of liquid/evaporated milk monthly consumption group
 - 4.3.2 Distribution of fresh milk monthly consumption group
 - 4.3.3 Distribution of condensed milk monthly consumption group
 - 4.3.4 Distribution of powder/formula milk monthly consumption group
 - 4.3.5 Distribution of sweetmeats monthly consumption group
 - 4.3.6 Distribution of yogurt monthly consumption group
 - 4.3.7 Distribution of butter monthly consumption group
 - 4.3.8 Distribution of ice cream monthly consumption group
- 4.4 Total money spend by the respondents on milk and dairy products
 - 4.4.1 Distribution of monthly money spend on liquid/evaporated milk
 - 4.4.2 Distribution of monthly money spend on fresh milk
 - 4.4.3 Distribution of monthly money spend on condensed milk
 - 4.4.4 Distribution of monthly money spend on powder/formula milk
 - 4.4.5 Distribution of monthly money spend on sweetmeats
 - 4.4.6 Distribution of monthly money spend on yogurt
 - 4.4.7 Distribution of monthly money spend on butter
 - 4.4.8 Distribution of monthly money spend on ice cream
- 4.5 Consumption behaviour of respondents during Covid-19 outbreaks.

- 4.5.1 Distribution of consumption milk and dairy products in the previous two years
- 4.5.2 Distribution of factors influence the respondents to buy milk and dairy products
- 4.5.3 Distribution of favourite dairy products
- 4.5.4 Distribution of buying frequency
- 4.5.5 Distribution of usage objective of milk and dairy products
- 4.5.6 Distribution of respondent's action when the milk and dairy product's price increases
- 4.5.7 Distribution of price changes during Covid-19 outbreaks
- 4.5.8 Distribution of actions that respondents took on the purchasing of the milk and dairy products during Covid-19 outbreaks
- 4.5.9 Distribution of consumption changes on dairy products during Covid-19 outbreaks
- 4.5.10 Distribution of location or services that respondents used to get milk and dairy products
- 4.5.11 Distribution of media used to get the information
- 4.5.12 Distribution of communities changes during Covid-19 outbreaks

CHAPTER 5	CONCLUSION AND RECOMMENDATION	75-76
REFERNCES		77-80
APPENDIX		81-88



LIST OF FIGURE

	Page	
4.1.1	Percentage of respondent's gender	21
4.1.2	Percentage of respondent's location	23
4.1.3	Percentage of respondent's household income level	24
4.1.4	Percentage of respondent's level education	25
4.2.1	Percentage of liquid/evaporated milk brand that respondents commonly use	27
4.2.2	Percentage of condensed milk brand that respondents commonly use	28
4.2.3	Percentage of fresh milk brand that respondents commonly use	29
4.2.4	Percentage of powder/formula milk brand that respondents commonly use	30
4.2.5	Percentage of sweetmeats brand that respondents commonly use	31
4.2.6	Percentage of yogurt brand that respondents commonly use	32
4.2.7	Percentage of butter brand that respondents commonly use	33
4.2.8	Percentage of ice cream brand that respondents commonly use	34
4.3.1	Percentage of respondents that consume liquid/evaporated milk	36
4.3.2	Percentage of respondents that consume fresh milk	37
4.3.3	Percentage of respondents that consume condensed milk	38
4.3.4	Percentage of respondents that consume powder/formula milk	39
4.3.5	Percentage of respondents that consume sweetmeats	41
4.3.6	Percentage of respondents that consume yogurt	42
4.3.7	Percentage of respondents that consume butter	43
4.3.8	Percentage of respondents that consume ice cream milk	44
4.4.1	Percentage of respondents that spend money on liquid/evaporated milk	45
4.4.2	Percentage of respondent that spend money on fresh milk	47
4.4.3	Percentage of respondents that spend money on condensed milk	48
4.4.4	Percentage of respondents that spend money on powder/formula milk	49
4.4.5	Percentage of respondents that spend money on sweetmeats	50
4.4.6	Percentage of respondents that spend money on yogurt	51
4.4.7	Percentage of respondents that spend money on butter	53
4.4.8	Percentage of respondents that spend money on ice cream	54
4.5.1	Percentage of changes in consumption of milk and dairy products in the previous two years	56
4.5.2	Percentage of factor that effect the choice for purchasing dairy products	57
4.5.3	Percentage of dairy products that the respondent's family really likes to use	58
4.5.4	Percentage of purchasing frequency on milk and dairy products	60
4.5.5	Percentage of milk and dairy consumption factor	61
4.5.6	Percentage of actions taken when the price of milk and dairy products increased	62

4.5.7	Percentage of changes in price on milk and dairy products during Covid-19 outbreaks	63
4.5.8	Percentages of respondents who reduce, did not reduce or uncertain to their budget during	64
4.5.9	Percentage of respondents who change their consumption on milk and dairy product	66
4.5.10	Percentage of location or services that respondents used to get the milk and dairy products	67
4.5.11	Percentage of media used to obtain information during Covid-19 outbreaks	68
4.5.12	Percentage of communities changes during Covid-19 outbreaks	69

LIST OF TABLE

		Page
3.1	Distribution of sample among different income groups	17
4.5.13	Mean of the consumption of dairy products based on different income level	71
4.5.14	Mean of milk and dairy product based on different areas	72
4.5.15	Mean of milk and dairy products consumption based on different areas.	74



CHAPTER 1

INTRODUCTION

1.1 Background of study

The eating and purchasing behaviour of people who consume milk and dairy products are influenced by a variety of circumstances, including the income of family members, the location of the family, natural calamities, and infectious diseases that affect the entire world, such as the COVID-19 pandemic.

Every year, there is an increase in the consumption of milk and dairy products, which is also explained by Suntharalingam (2019), who stated that domestic milk production in Peninsular Malaysia is growing at a relatively slow rate, whereas demand for milk has increased by approximately fourfold with both 2011 and 2017. Aside from that, in 2011, milk production was recorded at 25.40 million litres, and it steadily grew to 36.60 million litres, representing a gain of RM11.20 million litres in seven years, or a 5-per cent growth rate. Meanwhile, milk consumption climbed by 44.10 million litres during the same time, rising from 18.90 million litres in 2011 to 62.80 million litres in 2017. This represents a significant increase over the previous year's figure of 18.90 million litres. During the same time frame, the consumption of

milk increased at an annual pace of 22 per cent. Milk and dairy products are a significant source of nutrition for the majority of the world's population, and they are consumed on a regular basis. The reason for this is that it is not only used to make milk drinks but is also utilised to make a variety of other items as well. Dairy industry by-products such as whey, buttermilk, skim milk and ghee residue, as well as derived by-products such as casein, caseinates, lactose, whey proteins, and other derived by-products, are produced (Rafiq, 2019), because of their high nutritional value, attempts have been made around the world to utilise these by-products.

Milk also has a high concentration of nutrients that are required by people of all ages, including children, adolescents, and even adults. The use of formula milk in newborns is also increasing as a result of the fast-paced nature of modern living, while formula milk is still being used in youngsters as a nutritional supplement to help them grow at a more ideal rate. Delalic and Taljic (2019) mentioned that milk is a complete diet that contains a wide range of nutrients and fits the needs of those who are deficient in calcium, magnesium, selenium, riboflavin, vitamins B12 and B5. Improvements in living conditions, development, financial income, residency, and modernization all contribute to increased public awareness of the benefits of milk and dairy products intake in general. Consumers' wants and aspirations are reflected in the increase in the number of brands of dairy products produced by dairy farmers, as well as the diversity and creativity applied to improve the quality and taste of dairy products in response to those needs and desires. Additionally, the consumption of non-dairy-based milk is on the rise all across the world as a result. During the COVID-19 pandemic, the fear that the supply chain would be compromised, that stores would be entirely cut down, that the lockdown would be unthinkable was palpable, people began hoarding essentials like toilet paper, canned beans, yeast, flour,

and oat milk, causing a rush on basics, according to Iversen (2020). According to this, the consumption of plant-based milk is also on the rising trend, as oat milk became a vital necessity for Americans when the COVID-19 pandemic spread over the rest of the world.

The purpose of this study was to identify the pattern of milk and dairy product consumption across different household incomes in different locations, namely rural, town, and city when the COVID-19 pandemic hit. It was hypothesised that the findings of this study can provide insight into the factors that influence the consumption of milk and dairy products, as well as distinct knowledge about the variances in eating behaviour of milk products among the people of Sabah who live in different parts of the state. Confronted with a growing awareness of the consequences of misaligned policies affecting the dairy sector, the government stepped up its efforts to increase productivity and product quality during the Tenth and Eleventh Malaysia Plans (2010–2020), pursuing the development of new high-value-added products, empowering sustainable farming practices, and implementing cutting-edge modern agricultural technology.

1.2 Problem Statement

The consumption of milk and dairy products continues to rise in step with technological advancements that make it easier for consumers to obtain information and to purchase products with the convenience of using only their cellphones. In 2022, it is expected that the market will keep growing. Nonetheless, inflationary is heading up the cost of gas, electric, and gas fuel, and the prices for food and some other consumer items, which will also limit households' buying and spending ability in the long run. Labor shortages are widespread, and a scarcity of lorry drivers and dairy production workers is posing problems throughout the supply chain of dairy products. Difficulty at the harbours is forcing dairy shipments to be disrupted and a build-up of stockpiles to be created. According to the USDA, the demand for U.S. dairy products by both regional and abroad buyers continues to be strong in the current environment. Necessity Class I milk has decreased from a short time ago, when institutions reopened, increasing the supply for milk, yet demand for milk continues to be much higher than the 2020 forecast.

A major element influencing the consumption and purchase of milk and dairy products in Sabah is the household income of the household members. Households add more dairy products to their diets when their income rises. As a result of this site's favourable and significant impact on dairy product expenditure, low-income households who are qualified for the Supplemental Nutrition Assistance Program would receive the benefits of this service as well (Mohammed, 2020). If a household's income is low, the consumption of dairy products will be reduced. This is due to the fact that milk and dairy products are not the primary source of nutrition for some

Sabahans. As a result of religious, cultural, and ethnic diversity, the intake of milk and dairy products is not always balanced across the board for all Sabahans. It can be observed that some individuals who live in remote areas of the interior do not consume milk as part of their daily diet, instead relying on forest and river goods instead. Additionally, there are Sabahans that live far away from the island and rely solely on ocean resources for their daily sustenance and nutrition.

Dairy farm businesses will benefit from this study because it will provide them with information on the current situation of milk consumption in the state of Sabah. With this, it will be possible to boost the production of milk and dairy products in order to meet the demands and aspirations of consumers. Moreover, this research contributes to the government's goal of increasing production while lowering costs, increasing the income of farmers (and indirectly the country) through the efficient utilisation of resources, and reducing the reliance on unskilled labour through the adoption of modern technologies in the farms, which are all outlined in the Nasional Agro Food Policy (NAFP). There have been a few studies on consumer behaviour in relation to dairy product intakes around the world, but there have only been a few studies on consumer behaviour in relation to dairy products in Sabah, Malaysia.

1.3 Hypothesis of the Study

H₀: There is a significant relationship on consumption pattern of milk and dairy products among different income levels of residents of Sabah, Malaysia during the Covid-19 pandemic.

H₁: There is no significant relationship on consumption pattern of milk and dairy products among different income levels of residents of Sabah, Malaysia during the Covid-19 pandemic.

1.4 Research Questions

1. Is there any relationship between household income level with consumption pattern of milk and dairy product in Sabah?
2. Approximately how much do the residents of different areas in Sabah spend on milk and dairy goods such as liquid milk, condensed milk, fresh milk, formula milk, sweets and dairy products such as yoghurt, butter, and ice cream monthly?
3. What were the trends and ways to obtain and use milk and dairy products when the COVID-19 pandemic struck?

1.5 Scope of the study

In this study, the consumption pattern towards milk and dairy product is the main focus of the scope of the study. This is also focusing on different areas in Sabah like rural, town and city area which was used as independent variables. The behavioral of consumption of milk and dairy product during Covid-19 outbreak also

studied. To these several factors, respondents were chosen among Sabah residents in Malaysia.

1.6 Significant of the study

In this research, the consumption pattern of milk and dairy products among the consumers in different areas (rural, town and city) were highlighted. There were many significant of this study. One of them was to know the consumption pattern of milk and dairy products of different income level residents in Sabah, Malaysia. This study may help to encourage the Sabahan community to increase their intention to purchase milk and dairy products.

This study also gives knowledge to the consumers about the benefits of consuming milk and dairy products. While for the producers, this study can help them to identify and understand the buying behaviour among the consumers and increase and vary the milk and dairy products in markets in Malaysia.

1.7 Research objectives

The specific objectives were to:

- (i) determine the consumption pattern of milk and dairy products among rural, town and city areas of residents of Sabah, Malaysia during the Covid-19 pandemic.
- (ii) analyse the relationship between the consumption pattern of milk and dairy products among different household income levels.



CHAPTER 2

LITERATURE REVIEW

2.0 Concept of consumption pattern of milk and dairy product

To understand how different income groups spend their money on various types of goods, such as food, clothing, and other non-essentials, economists use the concept of consumption patterns. The concept of milk and dairy products is incredibly important for producers to learn so that they may design better sales techniques to encourage people to purchase in the present. Milk and dairy products are consumed by about 6 billion people globally, with the majority of these individuals living in developing nations. According to Bob Cropp (2020), a dairy economist at the University of Wisconsin-Madison, if vaccine success continues to lower instances of COVID-19, the world economy should improve, resulting in increased global demand for dairy products. A wide range of nutritional benefits are provided by milk, the most significant of which is that it is a nearly irreplaceable supply of dietary calcium, which justifies the effort required to increase its consumption. A significant negative to the intake of dairy-based foods is the widespread lactose intolerance among the adult population, which is a significant health risk (Silanikove, 2015).

As the level of manufacturing increased, the quantity of intake decreased as more than once per day to 1-2 times each week gradually to just seldom, and wealthier homes consumed more milk and milk products than poorer households on a whole (Njarui, 2011). For less developed countries, milk production is quite limited, and they rely heavily on products imported from other countries for their nutritional needs. If you compare international products to indigenous manufacture, they are significantly more expensive. This is due to the high cost of transportation, which results in the price of dairy products becoming extremely expensive. Furthermore, some less affluent residents are unable to purchase high-priced products. According to Njarui (2011), in Kenya raw milk was favoured over pasteurised, ultra high-temperature treatment, and powdered milk due to the fact that it was less expensive and more easily accessible. In certain countries, milk consumption is extremely low, despite the fact that their country's total milk production is extremely high. The per capita consumption of dairy products in Iran was 60 kg in 2014, which is exceptionally low and less than half the world average, despite the fact that Iran dairy industries corporation is the largest dairy products factory in the Middle East. The daily consumption of two yoghurts is cost-effective in women over the age of 80 in the general population and over the age of 70 in the two categories of women who are at elevated risk of fractures in the elderly (Ethgen, 2016).

The proportion of expenditure on milk and milk products in monthly per capita food expenditure was marginally greater in urban consumers 25.14% than in rural consumers 23.1% (Krishnadas, 2015). Because teenagers and youngsters do not have the financial means to acquire food items, milk and dairy product is always purchased by individuals who are already employed. The adult from 20 to 40-year-old age group, according to Gavhane, Khunt, and Ardesna (2013), accounts for the

biggest proportionate percentage of expenditure in both rural and urban areas. Milk intake, according to Jabber (1984), is affected by a number of variables, including but not limited to: income, religion, the age composition of the family members, and the ability to produce milk at home. According to Ahmed et al. (2006), the consumption of food items is influenced by consumer preferences, consumer income, population size, and the price of the product, the price of alternatives, and the availability of the product, among other factors. Increasing population growth, increased real income, and declining consumer costs are the primary drivers driving the demand for food, particularly milk and milk products.

2.1 Factor influence consumption pattern of milk and dairy product

2.1.1 Household size

The huge number of households has an impact on the volume of milk consumed as well. When a little baby is present in a family institution, milk consumption increases by five times the normal rate. According to Adefalu et al. (2015), results of the Pearson product moment correlation analysis revealed that the size of the household and the respondents' rank in the last assessment were substantially connected to their use of dairy products. This suggests that the size of the household has an impact on the amount of dairy products consumed by the individuals. As a result, it is reasonable to state that less heavily populated families

are more likely than densely populated households to achieve their dairy product requirements.

Additionally, according to the Mintel Analysis (Bryant, 2018), from 2013 to 2018, the average number of glasses of milk eaten in families with at least one kid under the age of 18 increased by at least one drink per day in families with at least one person under the age of 18. It is therefore possible for consumers to purchase dairy products for children in their households even if the customer does not prefer milk products individually. The intake of milk among family members will continue, but at a reduced rate. It is possible, however, that some products will be less popular with the entire family.

2.1.2 Income level

In an Eastern Turkey study, researchers discovered that there are socio-economic inequalities between urban and rural populations in terms of age, education, occupation, and income (Ates, Hacer, Ceylan & Melike, 2010). These differences have an impact on how people spend their money. Raw milk is the preferred method of consumption for rural customers. These clients are typically low-income and illiterate in their purchasing decisions. On the other hand, urban customers consume pasteurised milk, have better salaries than rural consumers.

2.1.3 Prices

The customer responds and adjusts his or her expenditures whenever the price of a product changes. Price-sensitive sales of branded milk products were seen to be greater. Consumers cut their purchases by a proportionately greater amount than the price change while using these goods, according to the manufacturer. One reason for this might be the increase in pricing for branded milk products, as well as the availability of cheaper non-branded competitors. Depending on the goods, the amount that customer demand changes will vary depending on the extent of the price adjustment and how significant pricing is in the decision to acquire the thing.

According to a recent study conducted by the Scottish Rural University College (SRUC), changes in fresh milk prices had only a little influence on demand. Cost of private branded milk was most sensitive to the price, and desire for nonfat milk being one of the most susceptible to market movements. Although there was a 1 percent increase in the price of milk, there was a less than 1 percent increase in sales for all types.

2.1.4 Food habits and social custom

Researchers have discovered that dairy consumption is associated with weight-related behaviours or concerns in children and adolescents, and that these behaviours varied depending on the gender of the participants. Accordingly, boys

desired to appear handsome and strong to females, whilst females worried about the fat content of dairy products and their impact on body weight.

2.2 Health effect of milk and dairy products

When consumed in large quantities, dairy products provide a comprehensive bundle of essential nutrients that are difficult to obtain in diets that contain little or no dairy products, such as vegan or dairy-restricted diets. In fact, dairy products are high in calcium, protein, potassium, and phosphorus, among other nutrients. Three portions of dairy products per day may be sufficient to meet the recommended daily intakes of nutrients required for good bone health, and milk and dairy products may therefore promote bone health and lower the risk of injuries in later stages of life if consumed in sufficient quantities throughout the day (Rizzoli, 2014). Apart from providing a variety of nutrients, milk and dairy products are also beneficial for maintaining bone strength and health. As a result, it is recommended that youngsters consume milk in order to aid in their growth. According to Ethgen (2016), The use of titrated calcium and vitamin D supplements in postmenopausal women with or without an elevated risk of osteoporotic fractures, depending on spontaneous calcium and vitamin D intakes, has been shown to be cost-effective.

Several factors have contributed to humans' ability to overcome the limitations imposed by lactose intolerance over the centuries: first, mutations, which occurred in specific populations, most notably in northern European Celtic societies and African nomads, in which carriers of the lactose intolerance gene converted from being

lactose intolerant to being lactose tolerant; second, the ability to develop low-lactose products such as cheese and yoghurt; and colon microbiome adaptation, which has allowed lactose intolerant individuals to overcome its intolerance. According to National American Association, gradually increasing lactose in the diet drinking tiny amounts of milk with meals, eating yoghurt, and ingesting cheese are excellent ways for controlling lactose sensitivity and satisfying one's nutritional requirements for dairy products.

Nutritional deficiencies, such as those in essential micronutrients like iodine, vitamin A, and iron, as well as insufficient protein and energy intake, are all important contributors to morbidity and death in both children and adults. Consequently, the consumption of dairy products would not only lower morbidity and death rates, but it would also improve nutritional imbalance in both children and adults, as previously stated.

CHAPTER 3

METHODOLOGY

3.1 Study site and experimental design

Keeping in view with the objectives of this study, a questionnaire was prepared to record the desired information from the consumers. A total of 64 consumers were participated in this survey, and this survey was conducted through online in September-November 2021 due to covid-19 pandemic. Respondents were required to be at least 18 years of age and familiar with their household's food shopping and purchasing behaviors.

A quantitative research strategy was employed to collect data regarding consumer perceptions, purchasing behaviour, and preferences for milk and dairy products from respondents. For this research, the independent variable is the income level groups (not more than RM2000, ranging from RM2001-RM3000, RM3001-RM4000, RM4001-5000 and more than RM5000), as well as the geographic locations (rural vs. town vs. city). Consumption patterns of milk and dairy products such as liquid milk, fresh milk, condensed milk, powder/formula milk, sweetmeats, yoghurt,

butter and ice cream were the independent variables in this experiment. Demographics from the sample of 64 participants are detailed in Table 3.1.

Table 3.1: Distribution of sample among different income groups

Income groups	Area			Total
	Rural	Town	City	
1. <2000	12	12	11	35
2. 2001 – 3000	2	6	6	14
3. 3001 – 4000	2	3	3	8
4. >5000	-	4	3	7
Total	16	25	23	64

3.2 Arrangements

The questionnaires were prepared based on consumer consumption of liquid/evaporated milk, fresh milk, condensed milk, powder/formula milk, sweetmeats, yogurt, butter, and ice cream toward household income when they were purchasing milk and dairy products. People who live in Sabah, Malaysia, were given questionnaires and the data was analysed and evaluated. Part A is about demographics,

like age, gender, education level, income level, and consumer location (rural, town, city). In Part B, the brand of milk and dairy products that people usually used was an independent variable that can be changed by the people. Part C was an independent variable that was the total amount of milk and dairy products that people consume every month. Part D was an independent variable that reveals how much money consumer spent on milk and dairy products every month. Part E covered the independent variables which were consumption behavioural on milk and dairy product and action taken during Covid-19 outbreaks.

Part A: Demographic profile

Questions prepared in this part were to study the bio of Sabah, Malaysia residence consumers. People were asked about their age, gender, total household income, education background, and whether they live in a rural, town, or city area.

Part B: Independent variables

This section contained the brand of milk and dairy products (liquid/evaporated milk, fresh milk, condensed milk, powder/formula milk, yoghurt, butter, and ice cream) that consumers commonly use.

Part C: Independent Variables

This part of the report shows how much milk and dairy products (liquid/evaporated milk, fresh milk, condensed milk, powder/formula milk, yoghurt, butter, and ice cream) consumed according to household monthly income.

Part D: Independent variables

This section contained the total money spent on milk and dairy products (liquid/evaporated milk, fresh milk, condensed milk, powder/formula milk, yoghurt, butter, and ice cream) towards consumers locations (rural, town, and city).

Part E: Independent variables

Covid-19 outbreaks were covered in this part, which included information on what consumption behavioral on milk and dairy products and what action was taken during the epidemic.

3.3 Overview on population and sample

The population and sample for this study were drawn from the domicile of Sabah consumers who reside in Malaysia, according to the findings. The overall number of target respondents was 64 households, who represented a diverse range of races, religions, cultures, and ages.

3.4 Data Exploration and Analysis

Data collected from the respondents were compiled, tabulated and analysed using one-way analysis of variance (ANOVA) and descriptive statistics with SPSS software in accordance with the study's goals.



UNIVERSITI
MALAYSIA
KELANTAN

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Demographic profile

4.1.1 Distribution of respondent's gender

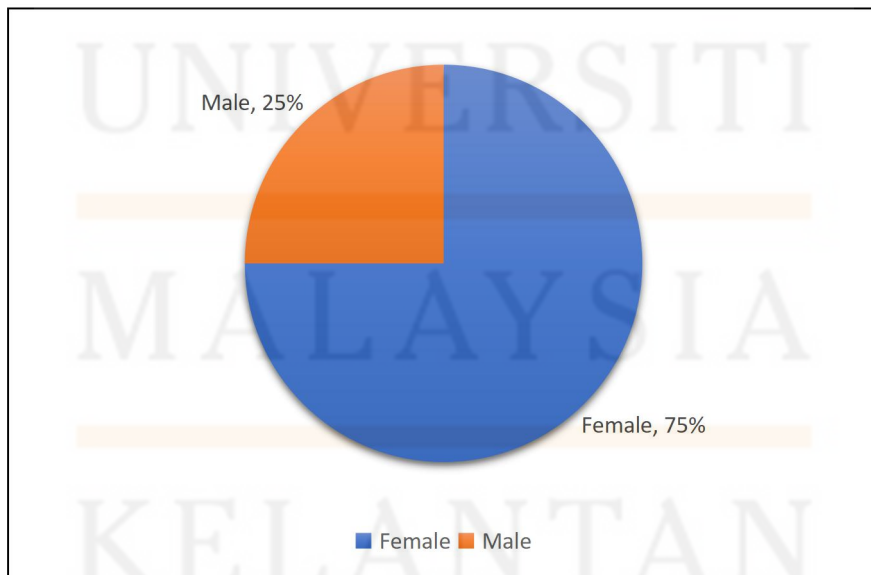


Figure 4.1.1: Percentage of respondent's gender

Figure 4.1.1 shows that most of the respondents participated in this survey were female (75%) and the remaining (25%) of respondents were male. Females were more likely than males to respond to online surveys, as illustrated in the Figure 4.1.1, because it is customary in Sabah for women to purchase household necessities and they are aware of which dairy products their family members consume on a monthly basis. Male may answer back to web-based surveys in higher proportions than female, according to some studies (Sax, Gilmartin & Bryant, 2003), whereas other studies report that women respond in greater proportions than men, based on traditional survey modes (Sax et al., 2004). An accurate assessment of the effect of such a fundamental demographic variable as gender on online survey response behavior is of critical importance to anyone who conducts or relies on research studies online surveys, and this includes researchers who conduct online surveys themselves.

4.1.2 Distribution of respondent's location

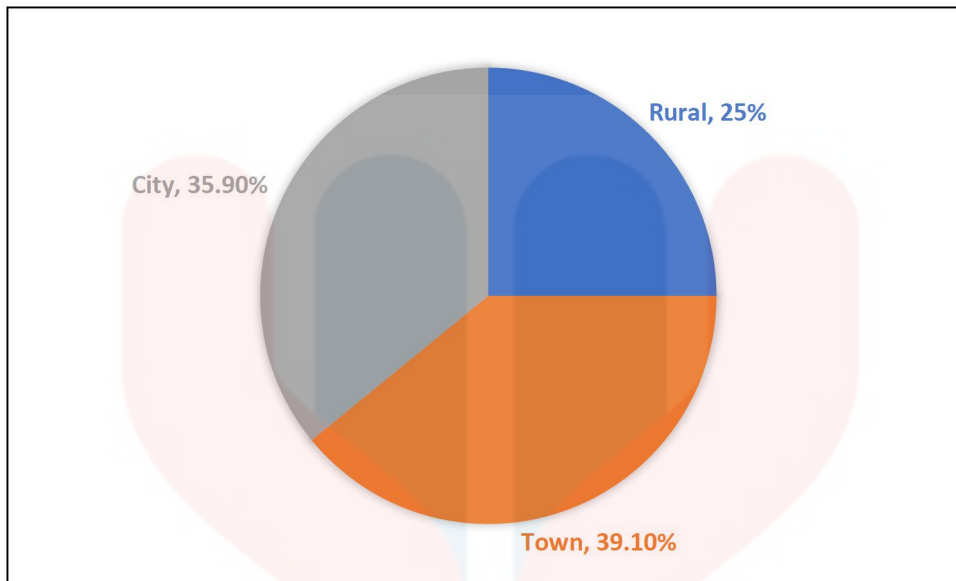


Figure 4.1.2: Percentage of the respondent's location

As shown in Figure 4.1.2, about 39.1% of respondents in this survey lived in the town area, 35.9% of respondents lived in the city area and 25% of respondents lived in the rural areas. Since rapid progress has made it easier for residents in rural areas to have smartphones and high-speed internet connections even if they live in a remote area of Sabah, most people living in the state can answer the questionnaire online, regardless of where they live (rural areas, towns, or city centres). Residence, whether it be urban or rural, is a major indicator of food choices, especially for young adults (Wang et al., 2002; Hodgkin et al., 2010). It is impossible to avoid urbanisation as a result of economic development, and It refers to the shift from a rural to a city-centered society in which the majority of people live.

4.1.3 Distribution of household income among respondents

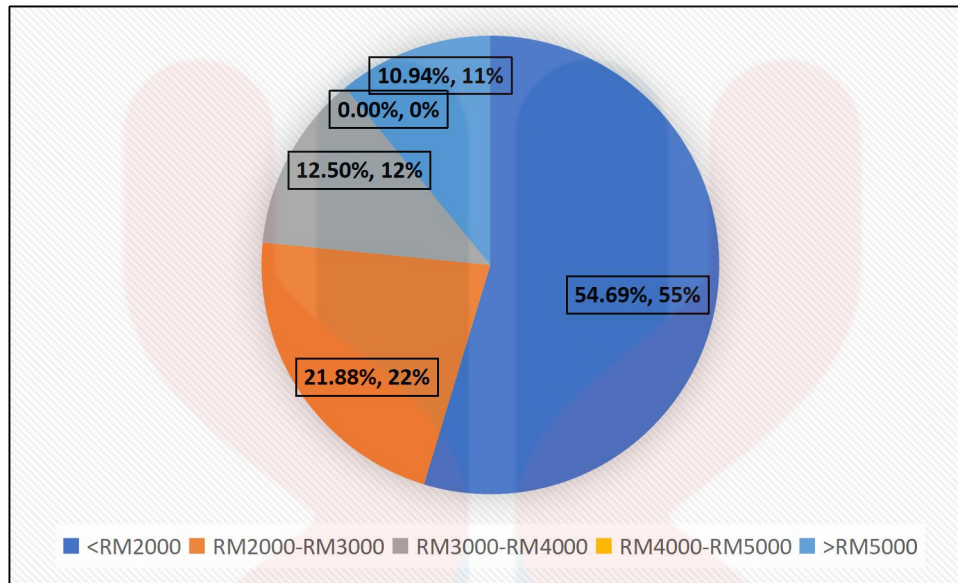


Figure 4.1.3: Percentage of respondent's household income

As shown in Figure 4.1.3, most of the respondents in this survey have a low household income of RM2000 or less. About 22% of respondents have a household income of RM2000-RM3000, 12% of respondents for household income RM3001-RM4000, and 11% of respondents have household income RM5000 upward. There is a misalignment between the economic development of Sabah and the outcomes obtained. Despite the fact that the oil palm farming industry is widespread, the majority of employment opportunities are reserved for foreigners from the Philippines and Indonesia. It is as a result of this that the average resident of Sabah can only earn a subsistence level of income and limited buying behavior among the people due to low family income. Increasing household income, according to the findings, is associated with a higher likelihood of fresh milk consumption. The findings of previous studies demonstrated that income is a significant factor in determining whether or not to purchase fresh milk (Celik Ates & Ceylan, 2010; De Alwis et al.,

2011). Dr. Rafiq Idris is an Economist and Senior Lecturer from the Financial Economics Programme, in the Faculty of Business, Economics, and Accountancy, at Universiti Malaysia Sabah (UMS) also mentioned that there are several problems that needed critical consideration, such as a low level of food self-sufficiency or a deficit in the food trade balance, issues with regulation and institution transformation in areas such as labor and business licensing, and even issues with unstable water supply in some areas. Furthermore, it is possible that Sabah is in the current economic situation as a result of policies that are not conducive to growth.

4.1.4 Distribution of education level among respondents

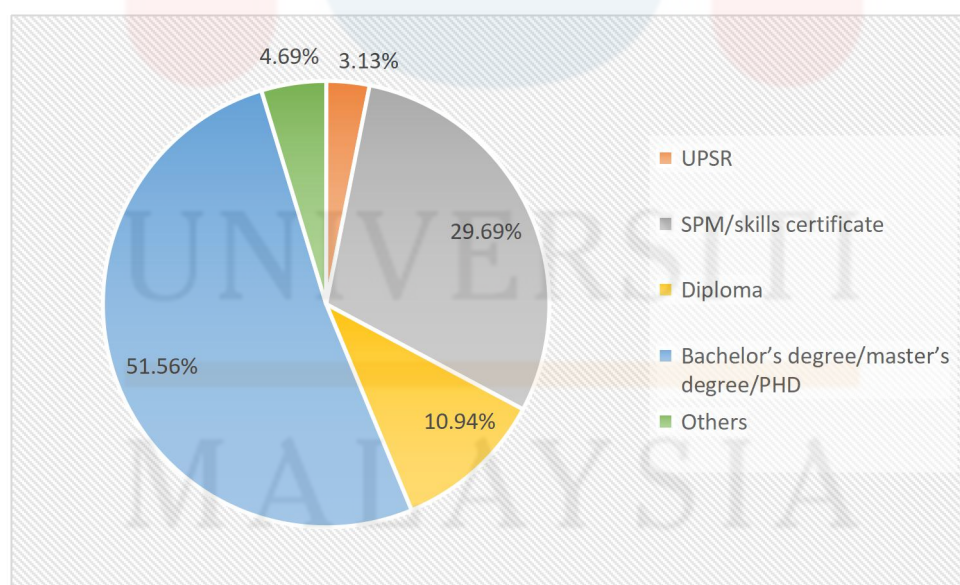


Figure 4.1.4: Percentage of respondents' level of education

Figure 4.1.4 shows that more than half of the respondents in this survey had an educational level in Bachelor's degree/Master's degree/PHD followed by 10.94% of the respondents had the diploma, 29.69% of the respondents had SPM/Skills certificate, 3.13% of the respondents had UPSR and 4.69% of the respondents had other levels of education. This indicates that respondents with a high level of education are well-versed in the health benefits and nutritional value of dairy products. In addition, respondents with higher levels of education are more sensitive to the consumption of dairy products by their families on a monthly basis, according to the survey results.

4.2 Milk and dairy product brand

4.2.1 Distribution of liquid/evaporated milk brand

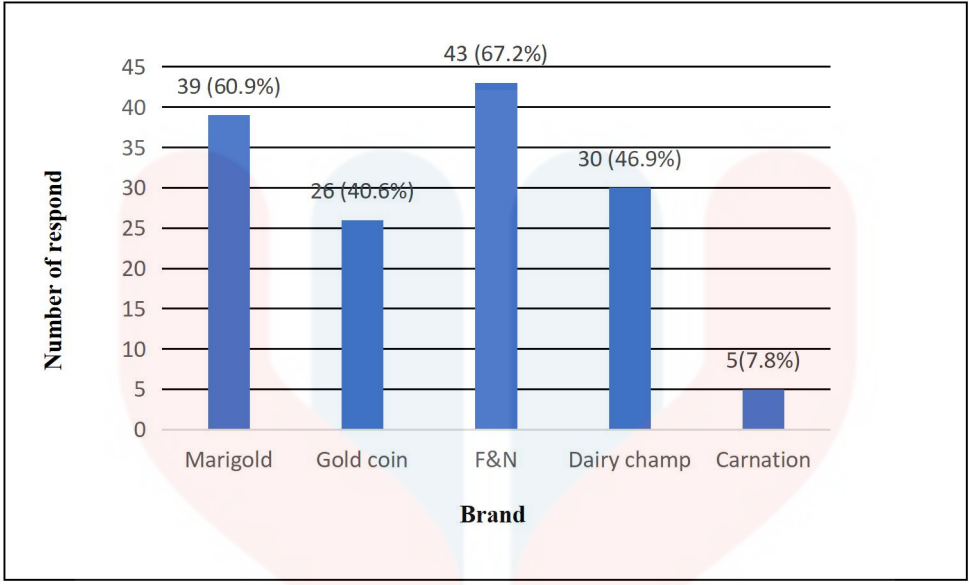


Figure 4.2.1: Percentage of the liquid/evaporated milk brand that respondents commonly use

Figure 4.2.1 shows that most of the respondents in this survey were preferred F&N brand 67.2% for evaporated milk, followed by Marigold 60.9%, Dairy champ 46.9%, Gold coin 40.6%, and Carnation 7.8% of the respondents. As a result of its high-quality ingredients, F&N evaporated milk has become the most popular choice for a variety of dishes. This product line is a great complement to any type of cuisine preparation. Cholesterol and trans fatty acids are absent, and calcium and vitamins A and D3 are plentiful. Furthermore, F&N is more affordable and less expensive.

4.2.2 Distribution of condensed milk brand

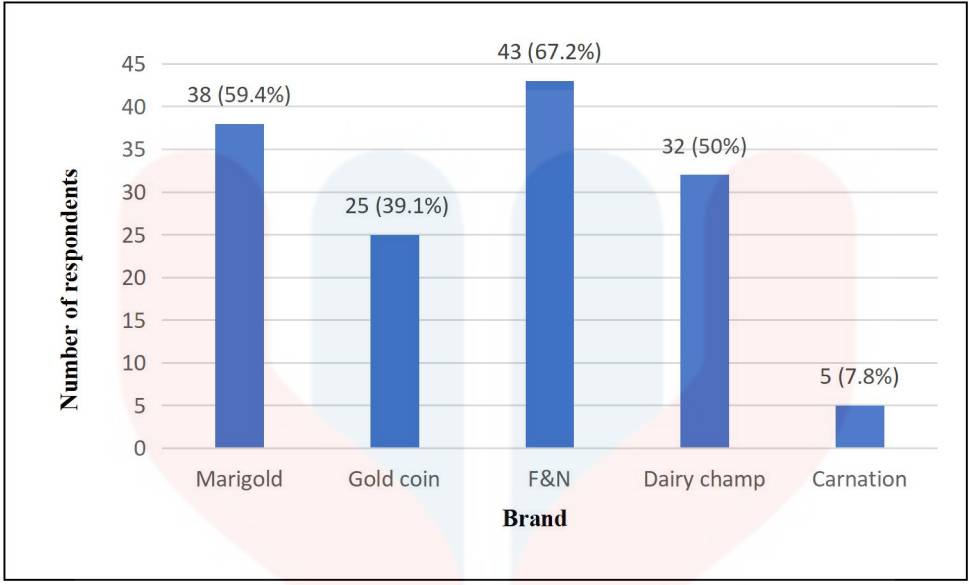


Figure 4.2.2: Percentage of the condensed milk brand that respondents commonly use

Figure 4.2.2 shows that F&N was the most choice of brand of condensed milk among the respondents followed by Marigold 59.4%, Dairy champ 50%, Gold coin 39.1% and Carnation 7.8% of the respondents. F&N Sweetened condensed milk has been comforting for centuries for decades, and its rich, milky awesomeness enhances the enjoyment of hot and cold beverages by imparting a distinctively rich and creamy flavor.

4.2.3 Distribution of fresh milk brand

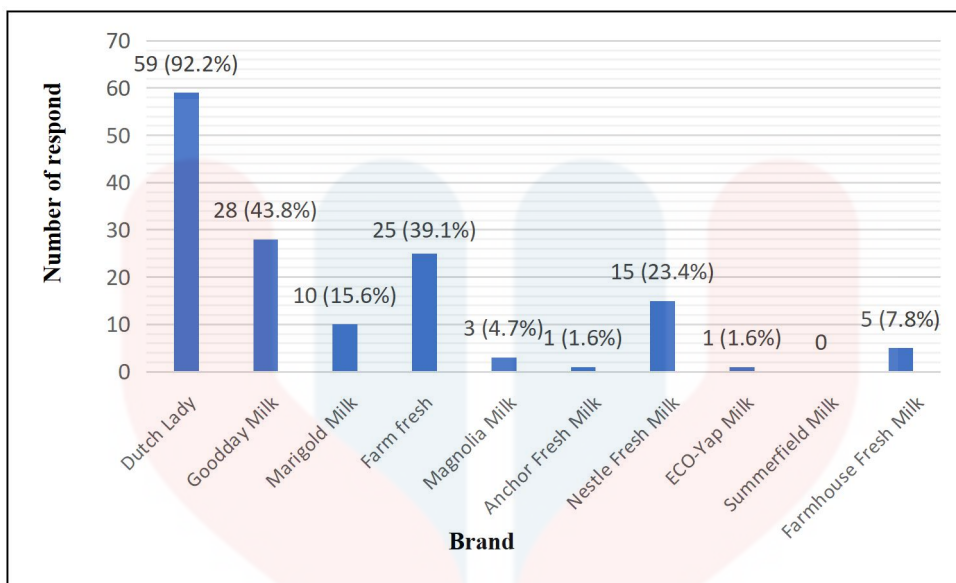


Figure 4.2.3: Percentage of the fresh milk brand that respondents commonly use

As shown in Figure 4.2.3, Dutch lady was the most popular fresh milk brand in Sabah with 92.2% of the respondents choosing to consume this brand. Followed by Goodday milk with 43.8% of the respondents, Farm fresh 39.1% of the respondents, Nestle fresh milk 23.4% of the respondents, Marigold milk 15.6% of the respondents, Farmhouse fresh milk 7.8% of the respondents, Magnolia milk 4.7% of the respondents and 1.6% of the respondents for Anchor fresh milk and ECO yap milk. Dutch Lady managing director Tarang Gupta said that SSL for fresh milk in the country is currently at 62 percent, according to the latest data. As the usage for fresh milk continues to grow on an annual basis, the government has been forced to develop new policies and strategies to increase fresh milk production in order to reduce reliance on imports.

4.2.4 Distribution of powder/formula milk brand

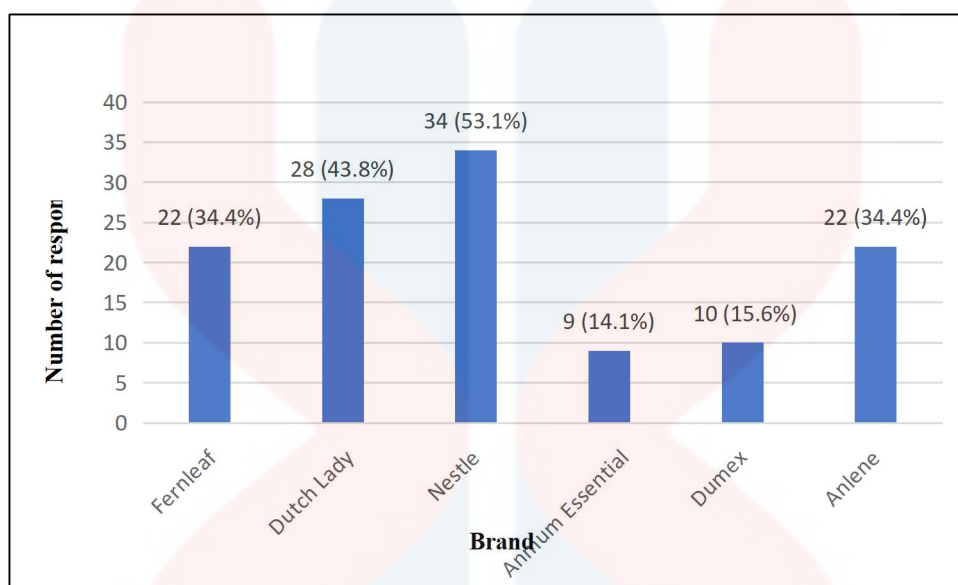


Figure 4.2.4: Percentage of the powder/formula milk brand that respondents commonly use

As shown in Figure 4.2.4, the most popular powder or formula milk brand among respondents was Nestle with 53.1% of the respondents were used this product, followed by Dutch lady 43.8% of the respondents, Fernleaf and Anlene 34.4% of the respondents respectively, Dumex 15.6% of the respondents and Annum essential 14.1% of the respondents. Baby formula milk is a widely popular product among new moms. In addition to formula milk for babies, there is also special formula milk developed specifically for the elderly to augment their nutritional needs. Diet during infancy may have an impact on subsequent body composition, and as compared to nursing, formula feeding is related with changed body composition throughout the first year of life (Gale, 2012).

4.2.5 Distribution of sweetmeats brand

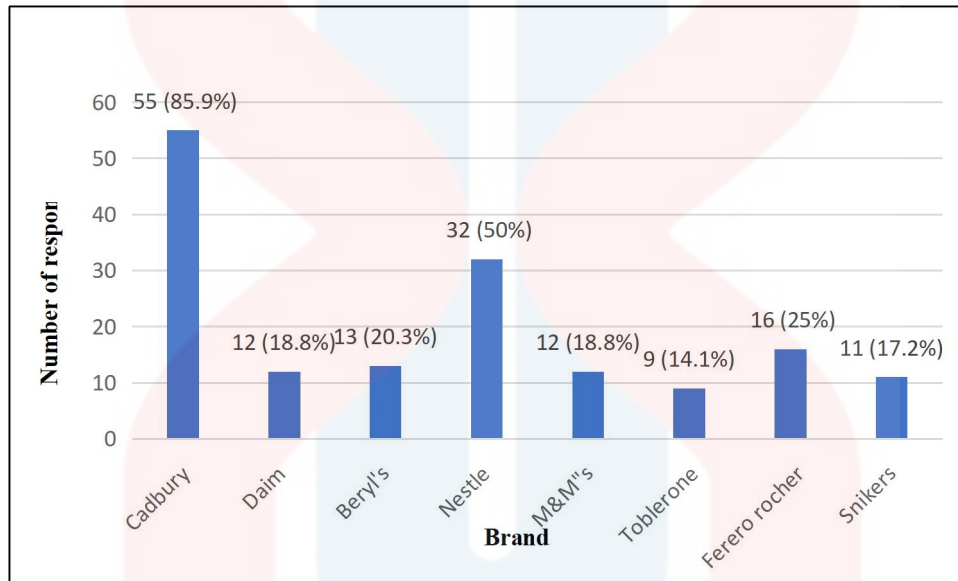


Figure 4.2.5: Percentage of the sweetmeats brand that respondents commonly use

Figure 4.2.5 shows that Cadbury was the commonly used sweetmeats product with 85.9% of the respondents loving it followed by Nestle 50% which half of the respondents liked it. 25% of the respondents like Ferero rocher, Beryl's 20.3% of the respondents, Daim and M&M's 18.8% of the respondents, Snikers 17.2% of the respondents, and Toblerone 14.1% of the respondents. This demonstrates that Cadbury has such effective marketing that it has prompted many people to identify the brand. Also influencing people's interest in a product are the flavour and price of a particular item. In a study conducted by Ahmed Al Sunni and Rabia Latif (2014), they

discovered that consuming 40 g of dark and milk chocolate every day for a period of two weeks was an efficient strategy to lower perceived stress in women.

4.2.6 Distribution of yogurt brand

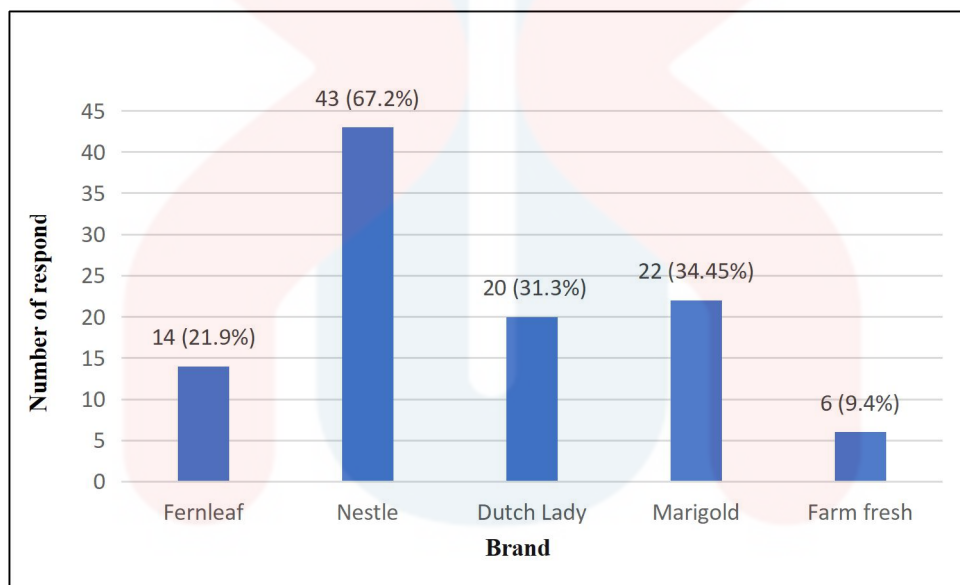


Figure 4.2.6: Percentage of the yogurt that respondents commonly use

Figure 4.2.6 shows that Nestle was the most popular brand with 67.2% of the respondents choosing this brand followed by Marigold 34.45% of the respondents, Dutch Lady 31.3% of the respondents, Fernleaf 21.9% of the respondents, and Farm fresh 9.4% of the respondents. Nestle yogurt is more well-known among the general public than yogurt produced by Farm Fresh, owing to the fact that the Farm Fresh brand is less prevalent on the market in Sabah. Several digestive advantages can be obtained from yogurt, and some types of yogurt contain probiotics, which can help to

improve digestive health by alleviating the symptoms of common gastrointestinal problems such as bloating, diarrhea, and constipation, among others. Most likely, the beneficial effects of yogurt consumption on gastrointestinal function are attributable to the effects mediated through the gut microflora, bowel transit, and the augmentation of the gastrointestinal innate and adaptive immune responses that are induced by the yogurt consumption (Adolfsson, 2004).

4.2.7 Distribution of butter brand

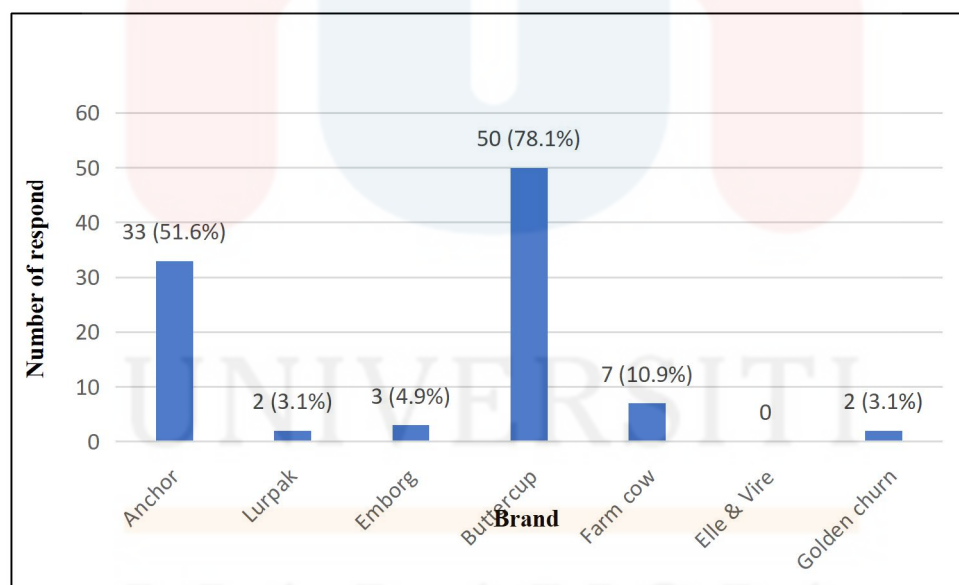


Figure 4.2.7: Percentage of the butter that respondents commonly use

As shown in Figure 4.2.7, the popular brand of butter in Sabah was Buttercup with 78.1% of the respondents use this brand, followed by Anchor 51.6% of the respondents, Farm cow 10.9% of the respondents, Emborg 4.9% of the respondents,

and Lurpak and Golden churn 3.1% of the respondents. The usage of butter in Sabah is only increased during the festival season, when it is used to prepare food and cakes; it is used very little for everyday cooking. Butter comprises vitamin D, which is a substance that is crucial for the maintenance and growth of bones. It also contains calcium, which is essential for maintaining bone strength. Calcium also has a role in the prevention of diseases such as osteoporosis, which is a condition that causes bones to become weak and fractured. It could also aid in the improvement of the skin's health. The findings of Pimpin et al. (2016), imply that a substantial emphasis on consuming more or less butter, on its own, may not be associated with significant variations in mortality, cardiovascular disease, or diabetes.

4.2.8 Distribution of Ice cream brand

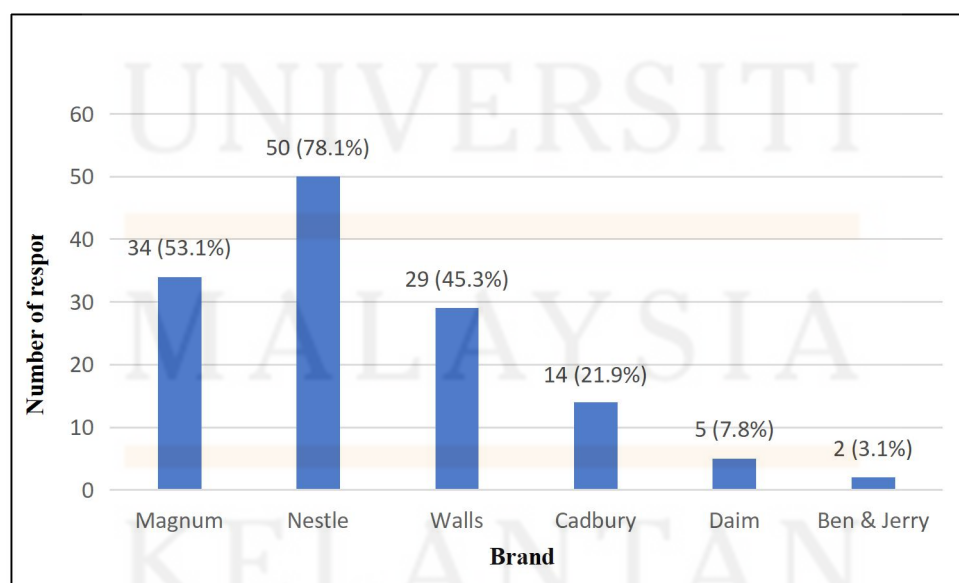


Figure 4.2.8: Percentage of ice cream that respondents commonly use

According to Figure 4.2.8, the most popular ice cream brand in Sabah was Nestle followed by Magnum with 53.1% of the respondents, Walls 45.3% of the respondents, Cadbury 21.9% of the respondents, Daim 7.8% of the respondents and Bend & Jerry 3.1% of the respondents. Ben & Jerry's was the top-selling ice cream brand in the United States for the 52-week period ending September 5, 2021, with sales of around 936 million dollars in the United States. However, in Sabah, Nestle ice cream brands such as Drumstick, Nestlé Ice Cream, La Cremeria, and Mat Kool have become popular choices. For the purpose of developing a formulation of satisfactory composition of ice cream, some of the factors that must be taken into consideration are the personal preferences of company management or customer demands for flavour, body, and texture, and colour characteristics of the finished product, which may include natural or fortified flavours with artificial flavouring; chewy to heavy, higher overrun; or more cooling body, texture, and colour characteristics of the finished product (Deosarkar, 2016).

4.3 Total consumption group of milk and dairy products

4.3.1 Distribution of liquid/evaporated milk monthly consumption

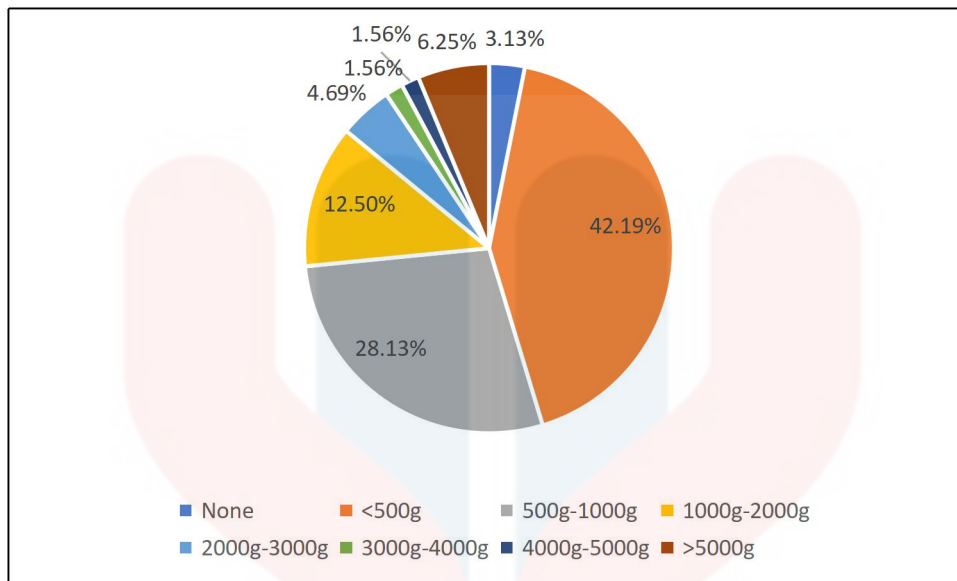


Figure 4.3.1: Percentage of respondents that consume liquid/evaporated milk

Figure 4.3.1 shows that most of respondents in this study consumed not more than 500g of evaporated milk every month. About 28.13% of the respondents will consumed 500g to 1000g evaporated milk, 12.5% of the respondents consumed 1000g to 2000g of evaporated milk, only 6.25% of the respondents consumed more than 5000g of evaporated milk, 4.69% of the respondents consumed 2000g to 3000g, 1.56% of the respondents consumed 3000g to 4000g and 1.56% of the respondents consumed 4000g to 5000g. From this study, it was found that 3.13% of respondents did not consume evaporated milk. According to the information gathered from the survey, the people of Sabah consumed less liquid milk than the rest of the world. Extreme consumption in a family is impacted by the number of family members present as well as their tastes. Liquid milk, on the other hand, is frequently employed in the food industry. When it comes to evaporated whole milk, it is primarily used in the confectionery industry, whereas evaporated skimmed milk is commonly used as a

source of milk solids in dairy applications, as well as in the production of ice cream, yoghurt, and other frozen desserts (such as frozen yoghurt parfaits) (Nouh, 2017).

4.3.2 Distribution of fresh milk monthly consumption group

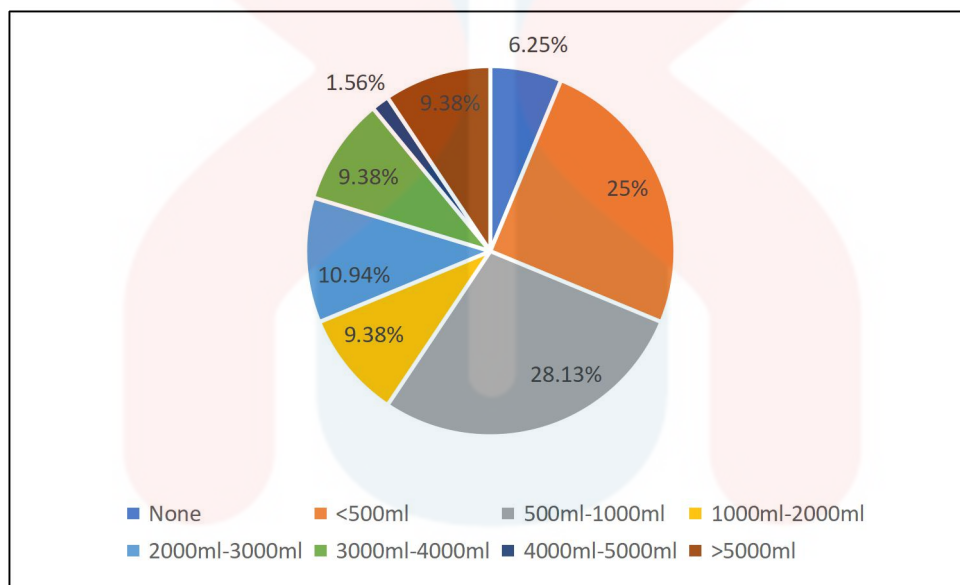


Figure 4.3.2: Percentage of respondents that consume fresh milk

As shown in Figure 4.3.2, 28.13% of the respondents consumed 500ml to 1000ml of fresh milk, followed by 25% of the respondents who consumed no more than 500ml of fresh milk, 10.94% of the respondents consumed 2000ml to 3000ml, 9.38% of the respondents consumed 1000ml to 2000ml, 9.38% of the respondents consumed 3000ml to 4000ml and 9.38% of the respondents consumed more than 5000ml. Only 1.56% of the respondents consumed 4000ml-5000ml monthly. This study also shows that 6.25% of the respondents did not consume fresh milk. The

intake of fresh milk is the topic that piques the curiosity of the survey participants the most. The excellent taste and appealing packaging of fresh milk are the primary reasons for the great demand for this product, despite the fact that there are significant variances in the way fresh milk is produced in different parts of the world. According to Lucey (2015), the milk is known as ultrapasteurized if it is packaged conventionally; if the process is carried out aseptically, the milk can be stored at room temperature, and this product is known as ultra-high temperature milk (UHT).

4.3.3 Distribution of condensed milk monthly consumption group

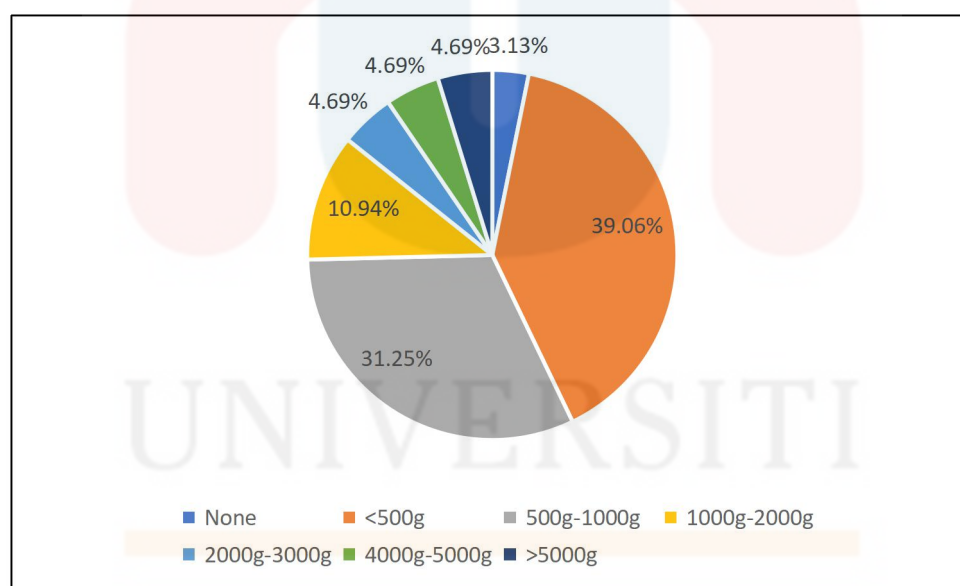


Figure 4.3.3: Percentage of respondents that consumed condensed milk

As shown Figure 4.3.3, 39.06% of the respondents consumed not more than 500g of condensed milk monthly. Followed by 31.25% of the respondents consumed 500g to 1000g, 10.94% of the respondents consumed 1000g to 2000g, and 4.69% of

the respondents in each consumption group of 2000g to 3000g, 4000g to 5000g, and more than 5000g respectively. This research shows that only 3.13% of respondents did not consume condensed milk. Condensed milk is frequently chosen by the people of Sabah as a sugar alternative in the production of beverages such as tea, juice, and coffee. However, because formula milk is so expensive on the market, some people who live in poverty and whose breast milk supply is diminishing utilise condensed milk as a substitute for breast milk. Sugar-sweetened condensed milk (SCM) should not be given to young children (1-3 years old) if the goal is to promote their growth and development (Juffrie, 2020). This is because SCM has minimal nutritional value and has a high sugar concentration.

4.3.4 Distribution of powder/formula milk monthly consumption group

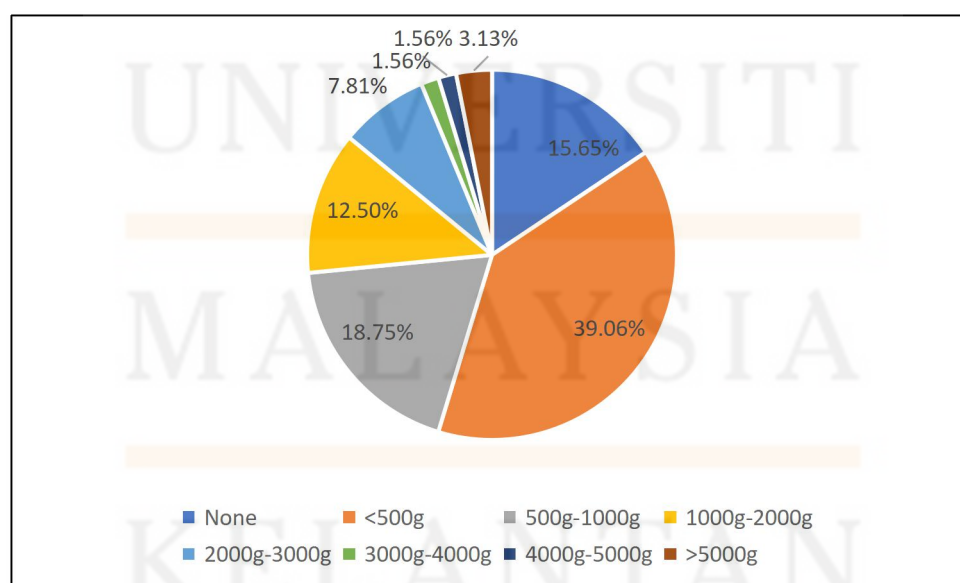


Figure 4.3.4: Percentage of respondents that consumed powder/formula milk

As shown in Figure 4.3.4, 39.06% of the respondents consumed not more than 500g of powder/formula milk every month. Followed by 18.75% of the respondents consumed 500g to 1000g of powder/formula milk, 1.56% of respondents consumed 4000g to 5000g, 12.5% of the respondents consumed 1000g to 2000g, 7.81% of the respondents consumed 2000g to 30000g, 3.13% of the respondents consumed more than 5000g powder/formula milk, and only 1.56% of the respondents consumed 3000g to 4000g. This study also shows that 15.65% of the respondents did not consume powder/formula milk. The respondents in this study were 15 years and older, and over half were unmarried and still teenagers. Adolescents consume less powdered milk as a result. In comparison to parents and married couples, the usage of powdered milk is extremely high, especially among families with exclusively formula-fed infants. Many parents often buy formula milk based on popularity and affordability alone, without considering the benefits inherent in it. According to Tan et al. (2016), parents were able to identify and recollect individual nutrients and food ingredients of milk powder by name, but they were unable to explain how they functioned.

4.3.5 Distribution of sweetmeats monthly consumption group

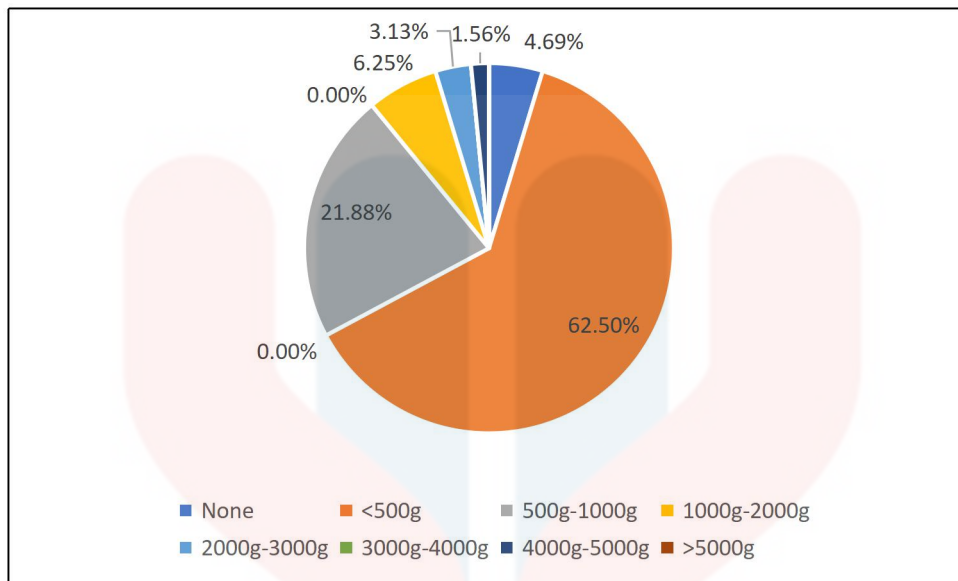


Figure 4.3.5: Percentage of respondents that consume sweetmeats

As shown in Figure 4.3.5, 62.5% of the respondents consumed not more than 500g sweetmeats monthly followed by 21.88% of the respondents consumed 500g to 1000g, 6.25% of the respondents consumed 1000g to 2000g, 3.13% of the respondents consumed 2000g to 3000g, and only 1.56% of the respondents consumed 4000g to 5000g of sweetmeats. This study also shows that there are 4.69% of respondents not consume sweetmeat. The use of sweets is less of a concern for some Sabahans due to rumours that say that eating a lot of sweets can cause diabetes. According to Matin et al. (2020), it is really uncommon to find someone who does not enjoy sweetmeats, as they are foods that are high in sugar and often contain milk.

4.3.6 Distribution of yogurt monthly consumption group

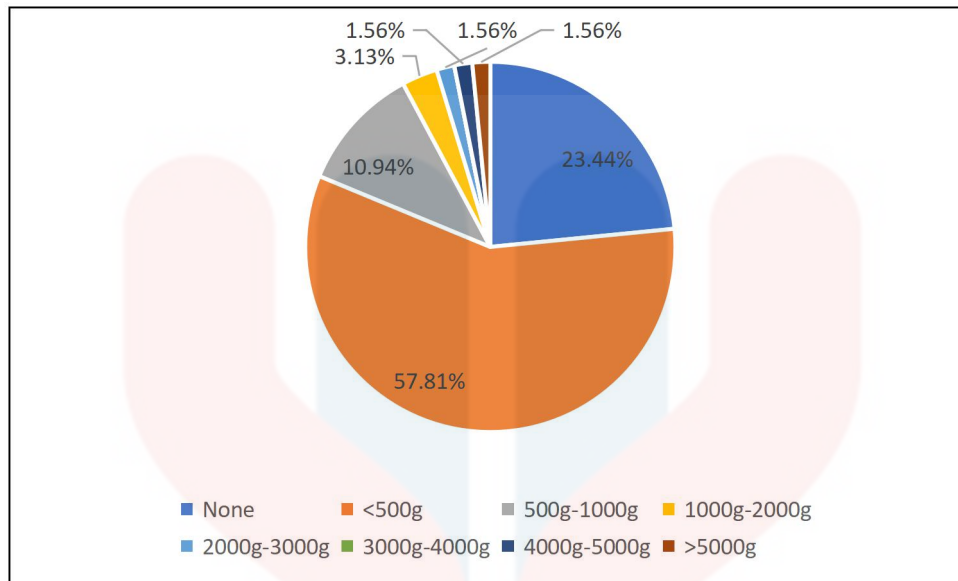


Figure 4.3.6: Percentage of respondents that consumed yogurt

As shown in Figure 4.3.6, about 57.81% of the respondents consumed not more than 500g of yogurt every month followed by 10.94% of the respondents consumed 500g to 1000g yogurt, 3.13% of the respondents consumed 1000g to 2000g, and each consumption group 2000g to 3000g, 4000g to 5000g and more than 5000g consumed by 1.56% respondent. This study also shows that 23.44% of the respondents did not consume yogurt. The results of the survey revealed that many respondents consume less or do not consume yogurt, despite the fact that numerous media outlets promote the advantages of yoghurt and that many new products have been introduced by producers. Some parents believe that yogurt is just a nutritious food for children; nevertheless, when adults consume it, they receive a significant amount of nutrients. Adult yogurt drinkers had lower weight, BMI, and waist circumference than non-consumers, and yoghurt intake was found to be substantially linked with reduced chances of being overweight or obese, as well as lower odds of

having an increased waist circumference, when compared to non-consumers (Cefelli, 2020).

4.3.7 Distribution of butter monthly consumption group

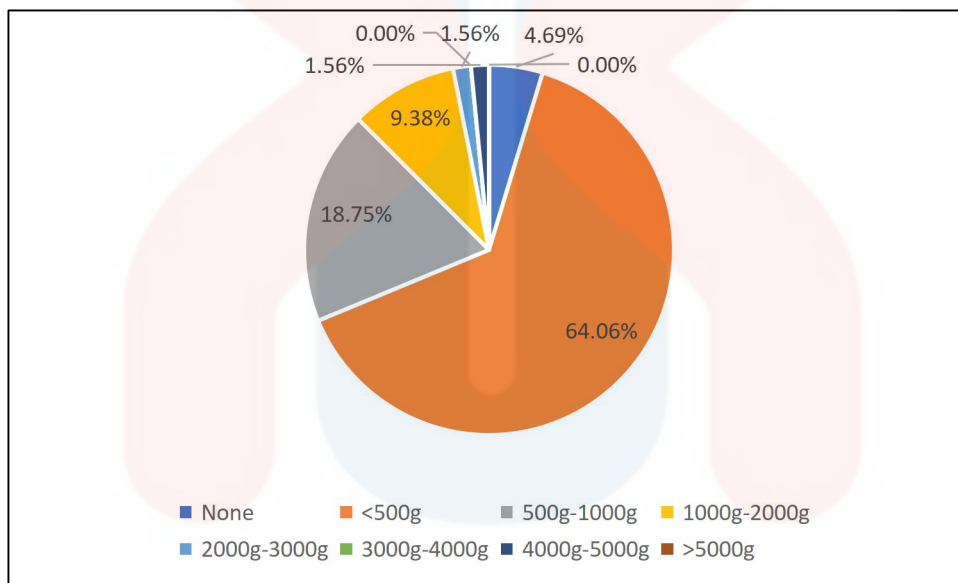


Figure 4.3.7: Percentage of respondents that consume butter

As shown in Figure 4.3.7, about 64.06% of the respondents consumed not more than 500g of butter every month followed by 18.75% of the respondents consumed 500g to 1000g butter, 9.38% of the respondents consumed 1000g to 2000g, and each of consumption group in 2000g to 3000g and more than 5000g were consumed by 1.56% of the respondents. This study also shows that 4.69% of the respondents did not consume butter. According to the findings of this study, the people of Sabah use less butter in their cooking because they are overly reliant on the

cooking oil accessible on the market. Furthermore, the cost of butter is prohibitively costly, and they feel that the use of butter is linked to a variety of ailments. We believe that eating butter, non-trans fat margarine, or plant sterol margarine within the recommended amounts does not affect indicators of inflammation and endothelial dysfunction (Gagliardi, 2010).

4.3.8 Distribution of ice cream monthly consumption group

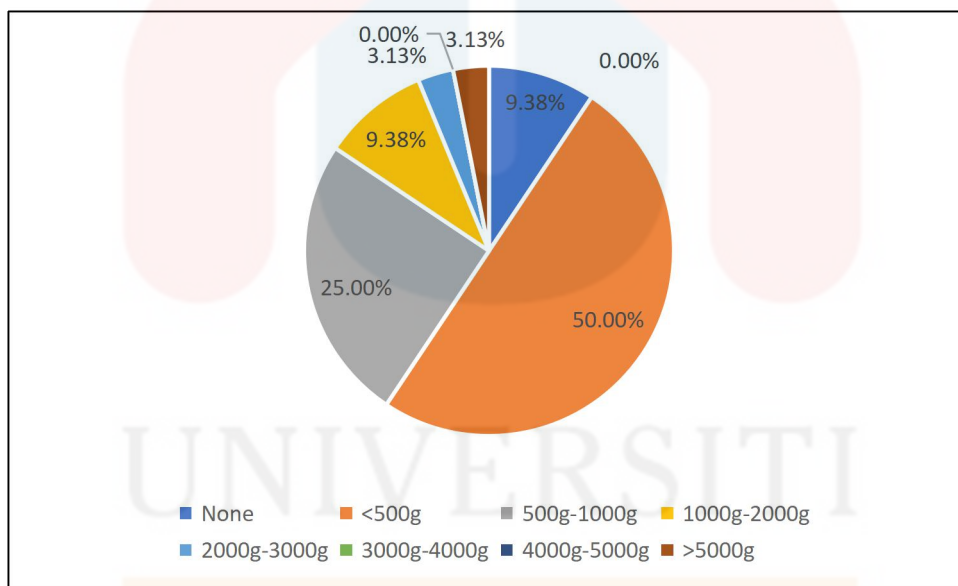


Figure 4.3.8: Percentage of respondents that consumed ice cream

As shown in Figure 4.3.8, about 50% of the respondents consumed not more than 500g ice cream every month follow by 25% of the respondents consumed 500g to 1000g of ice cream, 9.38% of the respondents consumed 1000g to 2000g, and each of consumption group in 2000g to 3000g and more than 5000g consumed by 3.13% of

the respondents. This study also shows that 9.38% of the respondents did not consume ice cream every month. According to the findings of the study, the usage of ice cream has decreased as a consequence of weather elements that vary according to the yearly season; yet, ice cream is frequently the preferred dessert of the people of Sabah during the summer. The eating of ice cream on a regular basis, regardless of body fat, is associated with a reduction in reward-region responsivity in humans, which is similar to the tolerance found with drug addiction (Burger, 2012).

4.4 Total money spend by the respondents on milk and dairy product

4.4.1 Distribution of monthly money spend on evaporated milk

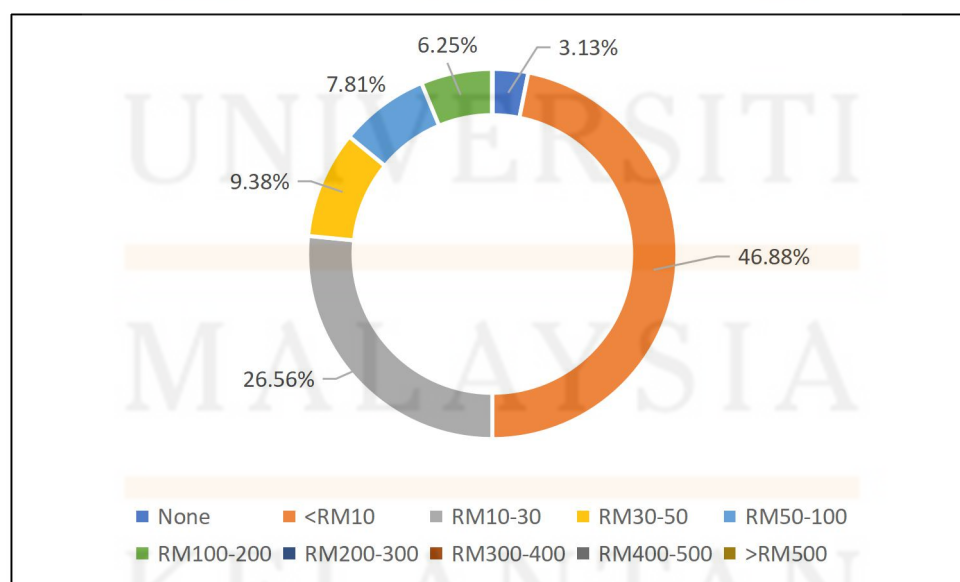


Figure 4.4.1: Percentage of respondents that spend money on liquid/evaporated milk

As shown in Figure 4.4.1, about 46.88% of respondents spent their money not more than RM10 on liquid/evaporated milk followed by 26.56% of the respondents spent their money around RM10 to RM30 on liquid/evaporated milk, 9.38% of the respondents spent around RM30 to RM50, 7.81% of respondents spent their money around RM50 to RM100, 6.25% of the respondents spent more than RM100 to RM200 and 3.13% of the respondents did not spend any money on liquid/evaporated milk. According to Aidoo (2009), the income level of the household head, the amount of urbanisation of the consumer location, and the distance between the household and the dairy product purchase point were determined to be the most important drivers of aggregate expenditure on dairy products. Because most of Sabah's communities are located distant from the city centre, they only purchase dairy goods on a relatively infrequent basis.

4.4.2 Distribution of monthly money spend on fresh milk

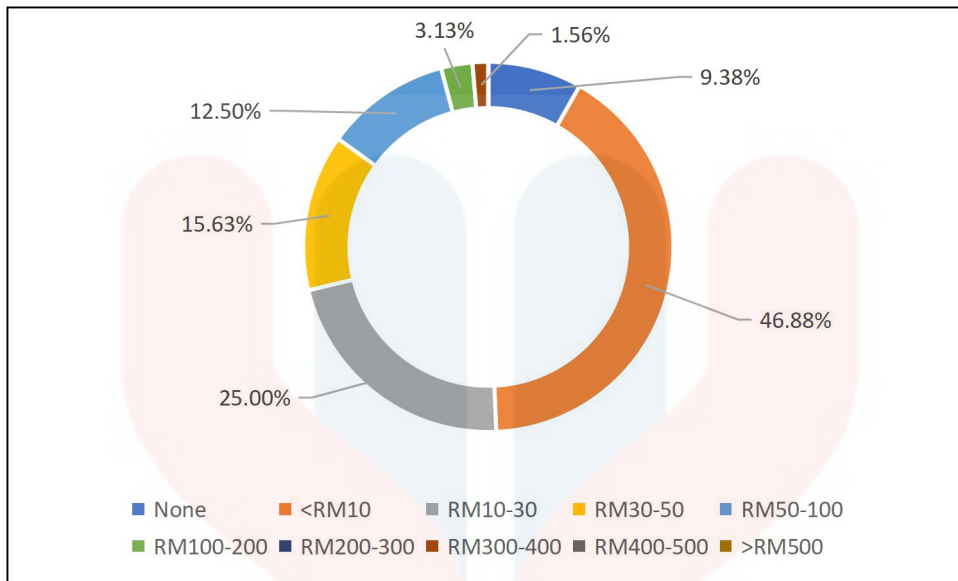


Figure 4.4.2: Percentage of respondents that spend money on fresh milk

Figure 4.4.2 shows that about 46.88% of the respondents spent their money on fresh milk, not more than RM10 every month followed by 25% of the respondents spent their money around RM10 to RM30 on fresh milk, 15.63% of the respondents spent money around RM30 to RM50, 12.5% of the respondents spent money around RM50 to RM100, 3.13% of the respondents spent money on fresh milk around Rm100 to RM200, and only 1.56% of respondents spending their money on fresh milk from RM300 to RM400. This study also shows there were 9.38% of the respondents did not spent any money on fresh milk. This study’s findings indicate that any increase or decrease in the price of fresh milk or yoghurt will have a considerable impact on the amount of milk and yoghurt purchased (Ullah, 2021). It was discovered that respondents find it simple to obtain fresh milk. Apart from that, the state of Sabah is home to a number of big fresh milk producers, including DESA fresh milk and Eco-yap fresh milk, among others.

4.4.3 Distribution of monthly money spend on condensed milk

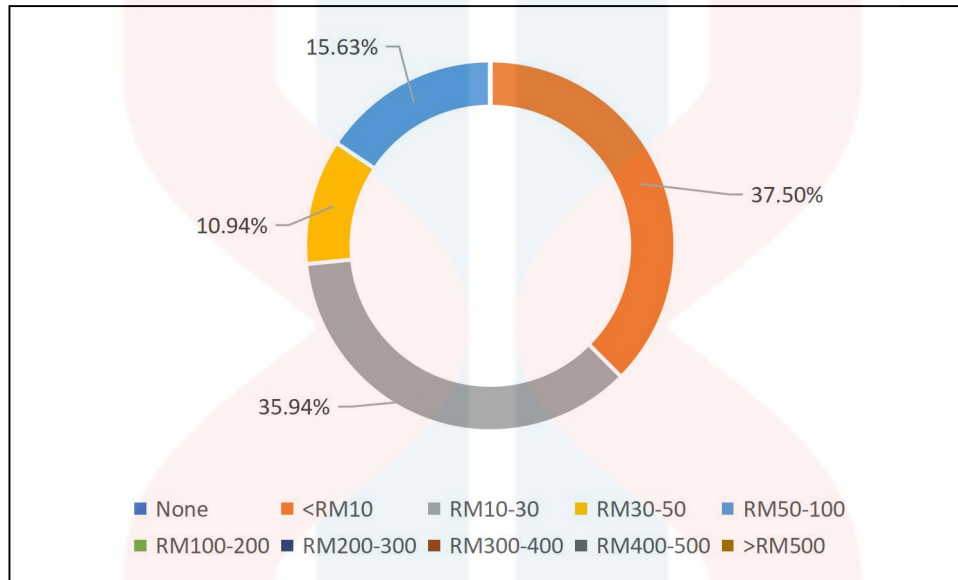


Figure 4.4.3: Percentage of respondents that spend money on condensed milk

As shown in Figure 4.4.3, about 37.5% of the respondents spent their money not more than RM10 on condensed milk followed by 35.94% of the respondents that spent money around RM10 to RM30, 15.63% of the respondents spent money around RM50 to RM100 and 10.94% of the respondents spent their money on condensed milk around RM30 to RM50. According to the results of this survey, practically all respondents purchase condensed milk at least once a month. Condensed milk is fairly inexpensive and readily available at any grocery shop. Aside from being long-lasting, a little intake of 1 to 3 cans is sufficient for a month's supply. According to Kalyankar, the use of condensed milk products has a number of advantages over the use of fresh

milk, including the fact that they take up less storage space, maintain good quality, preserve milk's precious excess nutrients, and minimise transportation expenses.

4.4.4 Distribution of monthly money spend on powder/formula milk

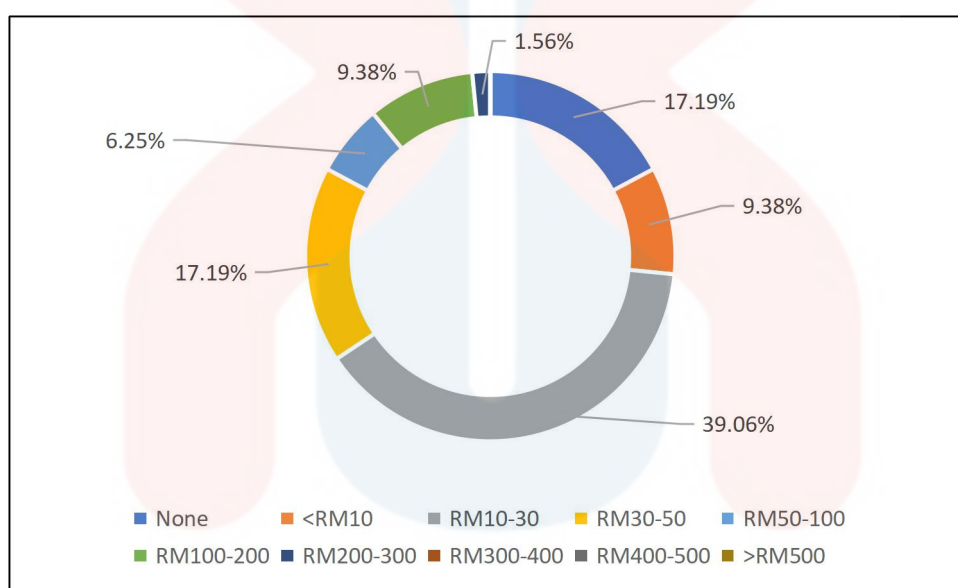


Figure 4.4.4: Percentage of respondents that spend money on formula/powder milk

As shown in Figure 4.4.4, about 39.06% of the respondents spent their money on formula/powder milk around RM10 to RM30 monthly followed by 17.19% of the respondents spent their money around RM30 to RM50, 9.38% of the respondents spent not more than RM10, 9.38% of the respondents spent around RM100 to RM200, and 6.25% of the respondents spent around RM50 to RM100 of condensed milk. As much as 17.19% of the respondents did not spend any money on formula/powder milk. According to the findings of the survey, many respondents did not purchase powdered

milk or formula because of the high cost, and they did not consider powdered milk and formula to be essential necessities. According to Dainelli, Xu, Li et al. (2017), the daily ingestion of a milk powder supplemented with potassium has been found to be a cost-effective way to lowering systolic blood pressure and reducing cardiovascular events in China.

4.4.5 Distribution of monthly money spend on sweetmeats

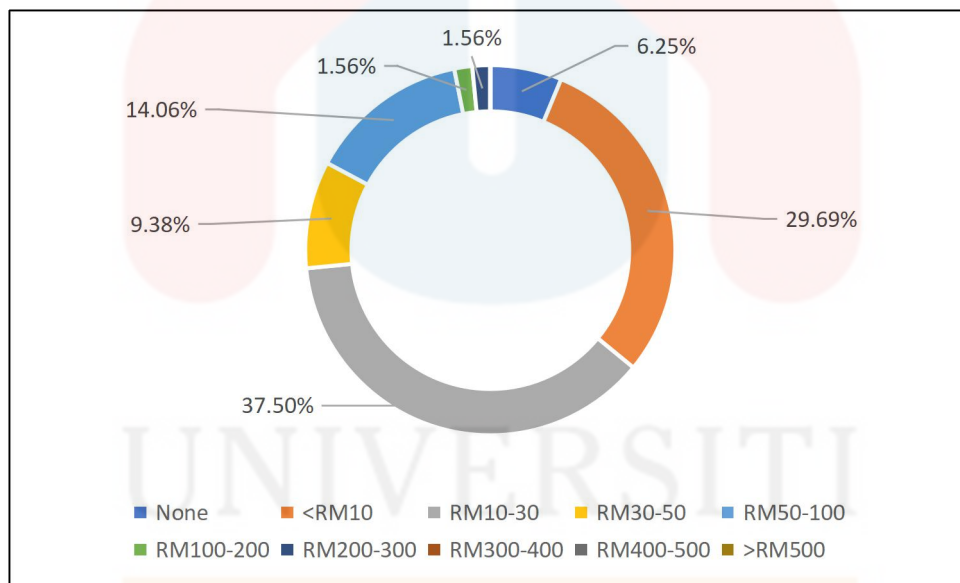


Figure 4.4.5: Percentage of respondents that spend money on sweetmeats

As shown in Figure 4.4.5, about 37.5% of the respondents spent their money around RM10 to RM30 on sweetmeats followed by 29.69% of the respondents spent money on sweetmeats not more than RM10, 14.06% of the spent money around RM50 to RM1000, 9.38% of the respondents spent money around RM30 to RM50,

around RM100 to RM200 and RM200 to RM300 of money spent by 1.56% respondents respectively. This study also shows that 6.25% of respondents did not spent any money on sweetmeats. According to the findings of this study, the purchase of sweets by adults is extremely low, which may be due to the fact that the people of Sabah are more concerned with their basic nutritional requirements. For milk and dairy products, the most significant allocation of expenditures was made for liquid milk, followed by sweetmeats and powder milk, as well as other dairy goods (Matin, 2020).

4.4.6 Distribution of monthly money spend on yogurt

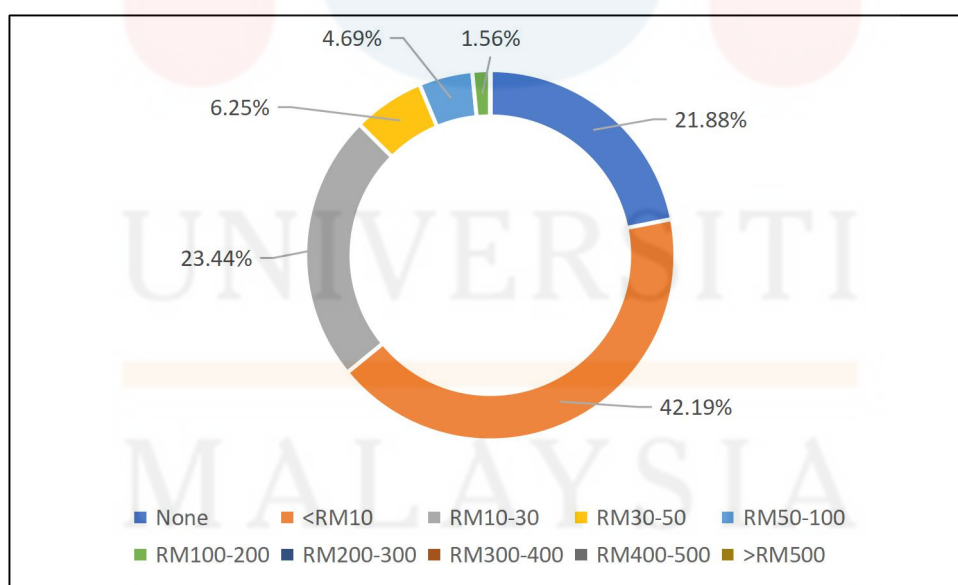


Figure 4.4.6: Percentage of the respondents that spend money on yogurt

As shown in Figure 4.4.6, about 42.19% of the respondents spent their money not more than RM10 on yogurt every month followed by 23.44% of the respondents spent money around RM10 to RM30, 6.25% of the respondents spent money around RM30 to RM50, 4.69% of the respondents spend money around RM50 to RM100, and only 1.56% of the respondents spent money around RM100 to RM200 on yogurt. This study also shows that 21.88% of the respondents did not spent any money on yogurt. According to the information gathered, the purchase of yoghurt is very rare among the people of Sabah, regardless of where they live: in rural regions, towns, or metropolitan centres. A lack of understanding of the value of yoghurt in maintaining internal health might explain this. As a result of the evaluation of the factors associated with amounts yogurt intake, an association was discovered between yogurt intake (in grams) and the following variables: smoking status, education of the head of household, and per capita family income. It was also discovered that with increasing per capita family income, yogurt intake increases by 0.61 grammes (Gabriela, 2015).

4.4.7 Distribution of monthly money spend on butter

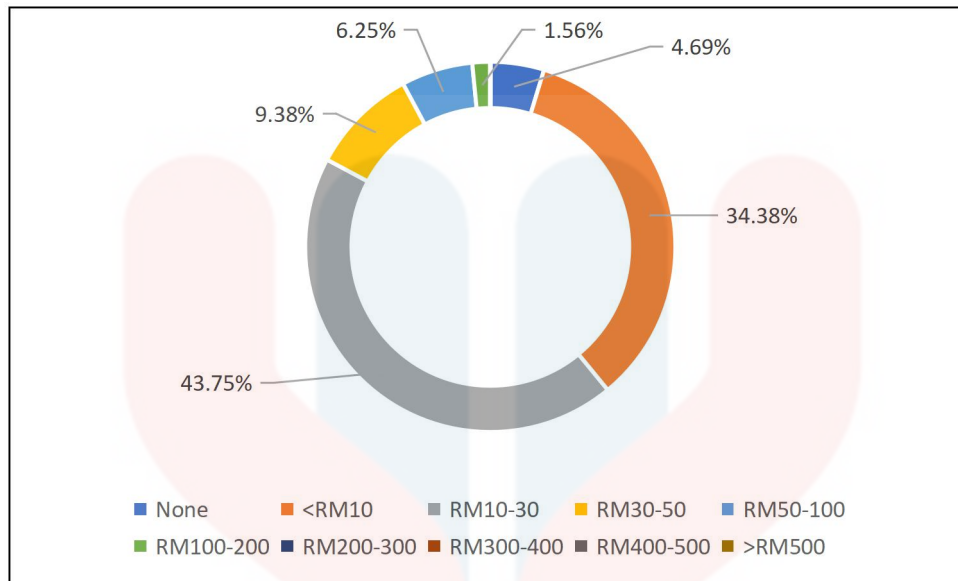


Figure 4.4.7: Percentage of respondents that spend money on butter

Figure 4.4.7 shows that 43.75% of the respondents spent money around RM10 to RM30 on butter every month followed by 34.38% of the respondents spent money not more than RM10, 9.38% of the respondents spent money around RM30 to RM50, 6.25% of the respondents spent money around RM50 to RM100, and only 1.56% of the respondents spent their money around RM100 to RM200 on butter. This study also shows that 4.69% of the respondents did not spend any money on butter. The results of the survey revealed that butter is not popular among customers, particularly among those who reside in rural areas. Most of this is attributable to a lack of understanding about the health advantages of butter among the people of Sabah. Because the manner of life of downtown inhabitants is more evolved, customers living in the city purchase more butter. According to Narwanare and Sonwane, butter, which contains 80 percent fat and is generally known as "Table butter" in the dairy sector, is one of the most essential dairy fermented dairy products in the human diet.

During the research period, 4951.8 packets of 500gm butter were prepared, resulting in a total cost of Rs. 2, 04,698.11 (approximately).

4.4.8 Distribution of monthly money spend on ice cream

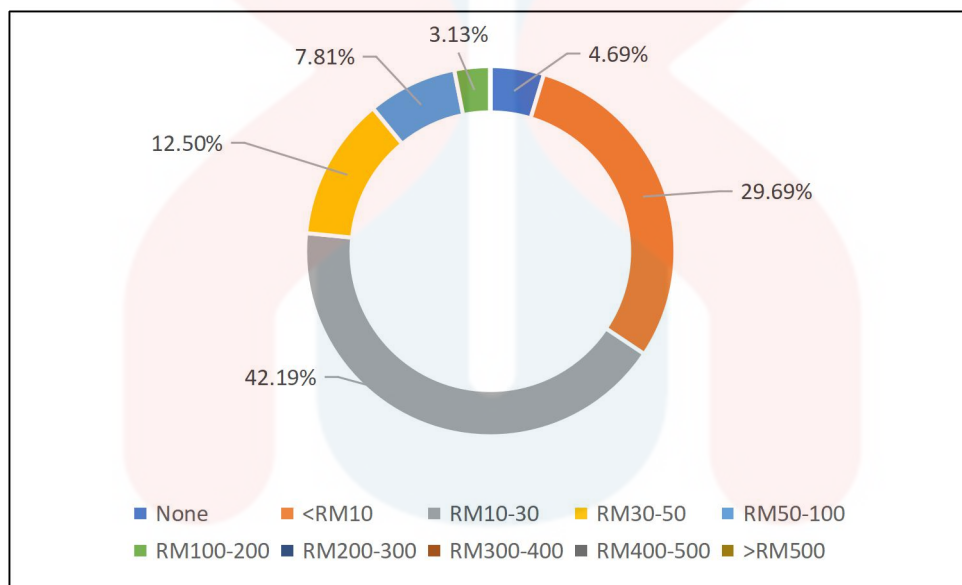


Figure 4.4.8: Percentage of respondents that spend money on ice cream

Figure 4.4.8 shows that 42.19% of the respondents spent their money around RM10 to RM30 on ice cream every month followed by 29.69% of the respondents spent money not more than RM10, 12.5% of the respondents spent money around RM30 to RM50, 7.81% of the respondents spent money around RM50 to RM100, and only 3.13% of the respondents spent money around RM100 to RM200. This study also shows that 4.69% of the respondents did not spend any money on ice cream. The invention and launch of the continuous freezer in the late 1920s had a significant role

in the sustained expansion of the business. Although ice cream was traditionally sold through soda fountains until the 1930s, the widespread establishment of supermarkets and specialty ice cream stores in the 1950s and 1960s had significantly altered the ice cream retailing landscape, with consumers being able to purchase packaged ice cream to take home with them. In today's market, the readily available supply of ice cream for both home and away-from-home consumption has continued to influence purchasing (Manchester & Blayney, 1997).

4.5 Consumption behaviour of respondents during COVID-19 pandemic

4.5.1 Distribution of consumption of milk and dairy products in previous two years

UNIVERSITI
MALAYSIA
KELANTAN

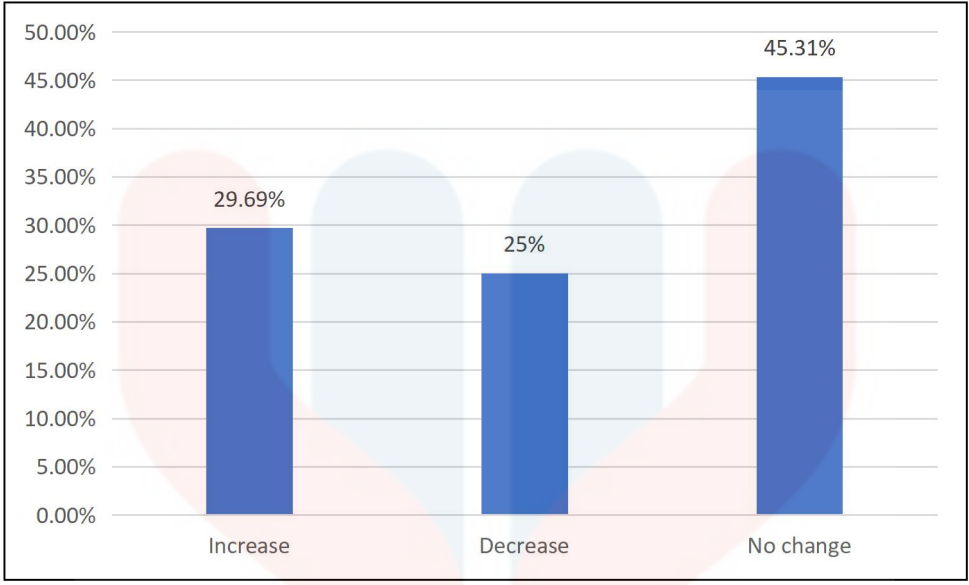


Figure 4.5.1: Percentage of changes in consumption of milk and dairy products in the previous two years

Figure 4.5.1 shows that 45.31% of respondents mentioned that there were no changes in consumption of milk and dairy products in the previous two years. In the past two years, there was a perceived increase in the intake of milk and dairy products, according to 29.69% of respondents and 25% of respondents who reduced their milk and dairy product consumption in the previous two years. This demonstrates that even after the COVID-19 pandemic struck the country, half of the population of Sabah continued to consume milk and dairy products on a regular basis in their normal lives. Respondents who increased their milk consumption during the COVID-19 pandemic included some who had never done so before. The reason for this is that everyone in the family stays at home and does a lot of activities in the kitchen, such as baking and cooking foods that call for the use of dairy products. Xu, Wang, and Li (2022), found that Corona Virus Disease 2019 (COVID-19) has resulted in a decrease in the overall consumption of dairy products in China, according to their research.

4.5.2 Distribution of factors influence the respondents to buy milk and dairy products

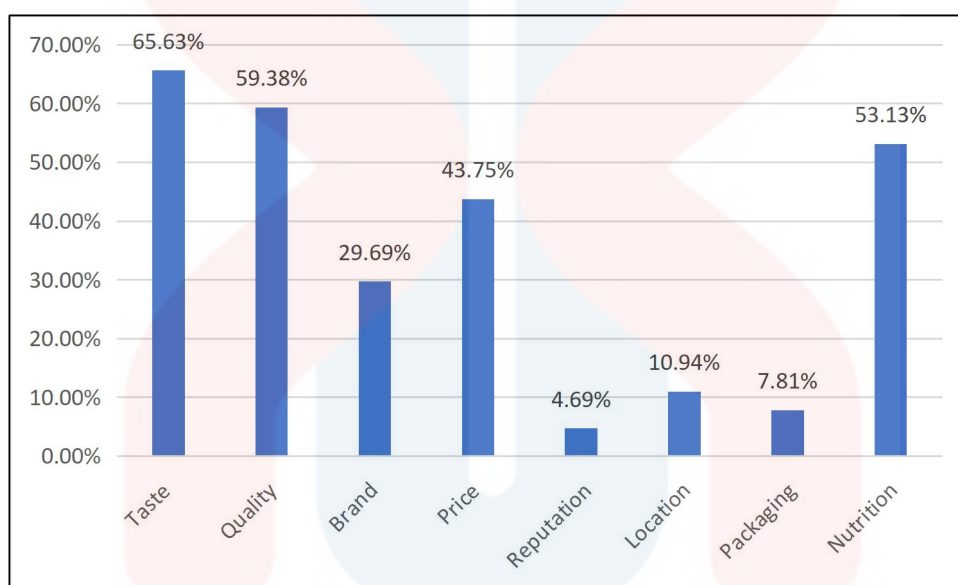


Figure 4.5.2: Percentage of factors that affect the choice for purchasing dairy products

Figure 4.5.2 shows that most of the respondents in this study preferred taste, quality, and nutritional value before consuming and purchase milk and dairy products. About 43.75% of respondents looked at the price before buying the dairy product. About 29.69% of the respondents looked for the brand, 10.94% of the respondents preferred to look for location, 7.81% of the respondents chose the dairy product by their packaging and only 4.69% of respondents concerned about dairy product reputation. According to the findings of this study, the people of Sabah are more concerned about the taste, quality, nutritional value, and price of a dairy product than

they are about the product’s location, packaging, and reputation. As a result of its well-balanced availability of protein, fat, carbohydrates, vitamins, and minerals as well as its high concentration of vital nutrients, such as calcium and necessary amino acids and fatty acids, milk is commonly considered to be nature’s most perfect food. The nutritional value of milk and its by-products is further enhanced by the concentration of these components that occurs during processing (David, 1988).

4.5.3 Distribution of favourite dairy products

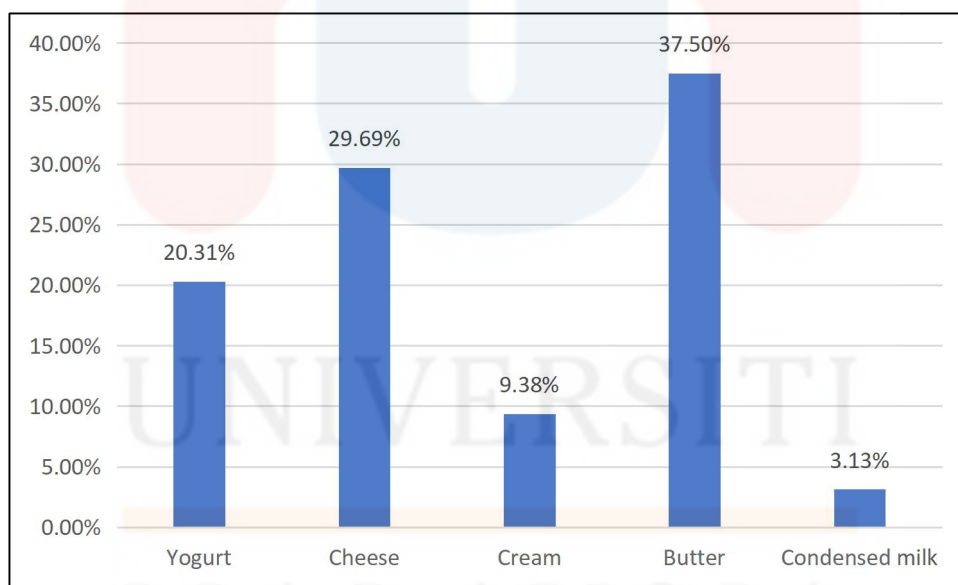


Figure 4.5.3: Percentage of dairy products that the respondent’s family really likes to

use

Figure 4.5.3 shows that most of the respondents love butter with 37.5% of the respondents really like this products followed by cheese 29.69% of the respondents,

Yogurt with 20.31% of the respondents, Cream 9.38% of the respondents and only 3.13% of the respondents love condensed milk. Figure 4.1.1 shows that female were the most likely to respond to this survey, with the majority of those responding representing people that enjoy cooking. Thus, butter was identified as the most favoured commodity in this research. Dairy products also face numerous obstacles on the road to market since certain communities do not believe dairy products to be a nutritious food. According to Lordan (2018), nutritional trends in western societies indicate that full-fat dairy product consumption is decreasing, whereas low-fat dairy product consumption is increasing in general.

4.5.4 Distribution of buying frequency

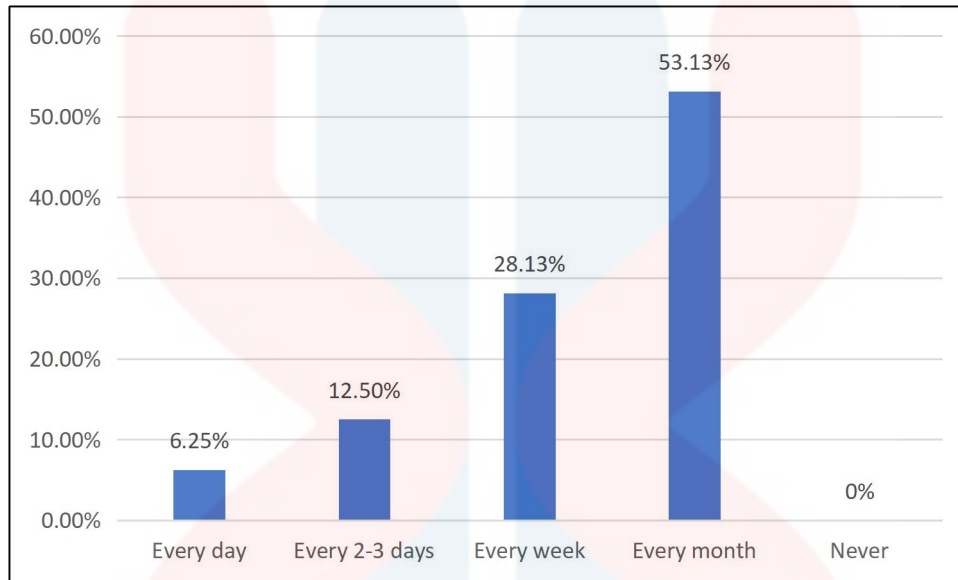


Figure 4.5.4: Percentage of purchasing frequency on milk and dairy products

Figure 4.5.4 shows that most of the respondents in this study purchased milk and dairy product every month, 28.13% of the respondents purchased milk and dairy product every week, 12.5% of the respondents purchased every 2-3 days and only 6.25% of the respondents purchased milk and dairy products every day. When there was bad news spread by some parties, purchases of dairy products were also lowered as a result. Purchase intention is not induced by perceived knowledge, but it is induced by trust in information sources. Once again, consumers' perceived risk leads to a decrease in trust in products, and hence in liquid milk, but not a decrease in confidence in information sources (Hoque, 2018).

4.5.5 Distribution of the usage objective of milk and dairy products.

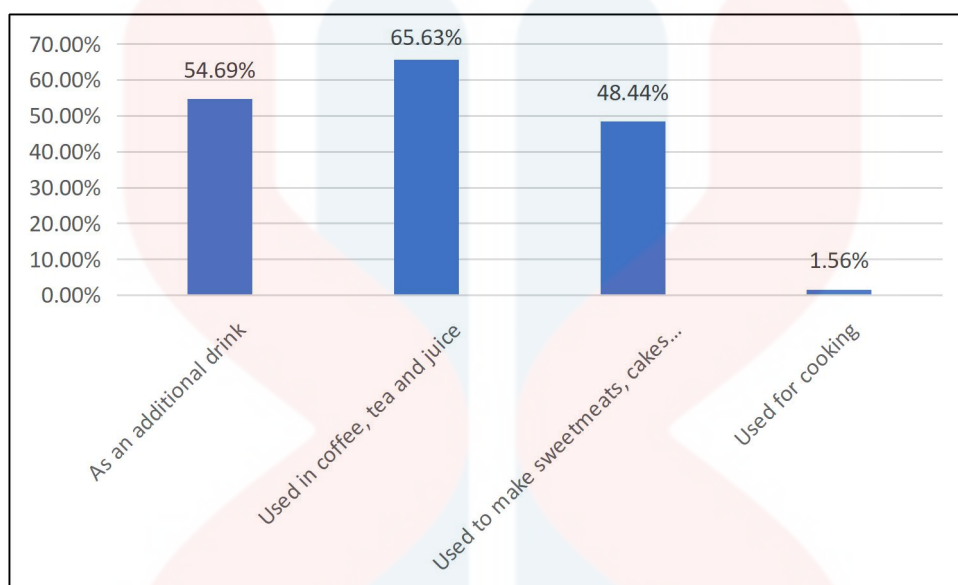


Figure 4.5.5: Percentage of milk and dairy products consumption factor

From Figure 4.5.5, it shows that most of the respondents which was 65.63% of the respondents used milk and dairy product in coffee, tea and juice followed by 54.69% of the respondents used milk and dairy product as an additional drink and 48.44% of the respondents used milk and dairy product to make sweetmeats, cakes and breads. Only 1.56% of the respondents used milk and dairy product for cooking. Dairy products have been utilised by humans from the beginning of recorded history to produce nutritious meals that are both fresh and storable. Most milk produced is eaten as fresh pasteurised whole, low-fat, or skim milk in various nations, accounting for about half of total milk production. However, the majority of milk is processed into more stable dairy products that are sold over the globe, such as butter, cheese, dry milks, ice cream, and condensed milk. In order to make their beverage more delightful,

most people blend condensed milk with other liquids such as coffee or milo as well as juice, tea, or other beverages to increase the flavour of the beverage.

4.5.6 Distribution of respondent's action when the milk and dairy products price increases

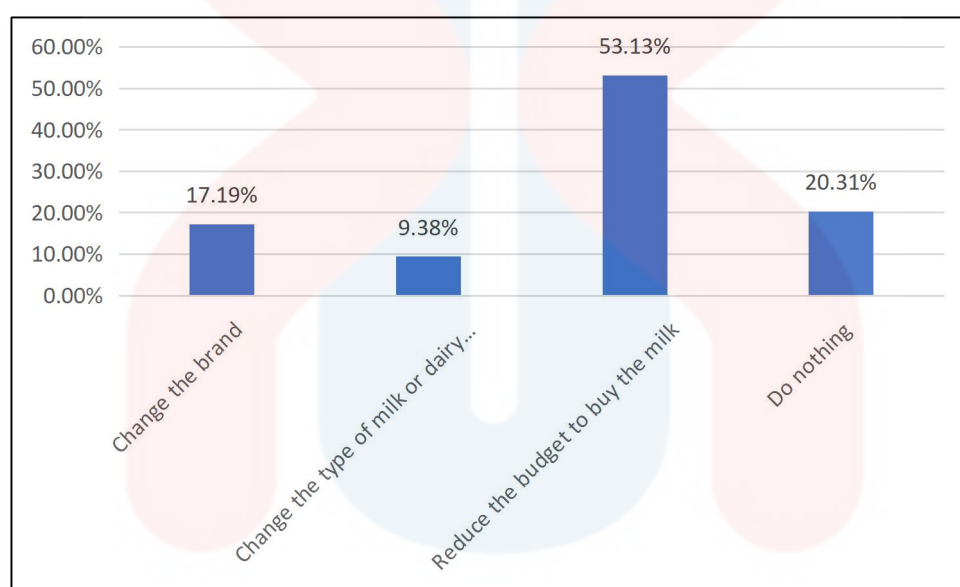


Figure 4.5.6: Percentage of actions taken when the price of milk and dairy products increased

Figure 4.5.6 shows that the action taken by the respondents after the price of milk and dairy products increases. It shows that 53.15% of the respondents reduced their budget to buy the milk and 20.31% of the respondents did nothing. The rest of the respondents (17.19%) mentioned that they changed the brand because there was certain brand that was high in price and the other 9.38% of the respondents changed the type of milk and dairy products. When milk costs rise, the majority of the

respondents preferred to cut their budget in order to purchase more milk. It indicates that the milk and dairy products are not the primary source of nutrition for the people of Sabah. Furthermore, the many brands and varieties of milk available on the market enable consumers to choose the one that best meets their financial situation as well as their preferences.

4.5.7 Distribution of price changes during Covid-19 outbreaks

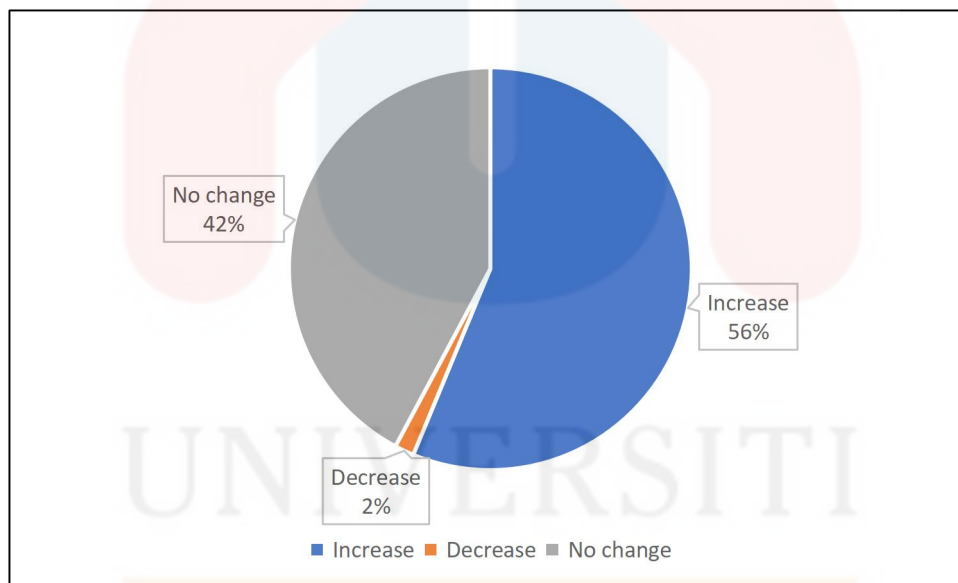


Figure 4.5.7: Percentage of changes in price on milk and dairy products during the Covid-19 outbreaks

Figure 4.5.7 shows that most of the respondents which 56% found that there were increasing in milk and dairy products prices during the Covid-19 epidemic. Almost half of the respondents mentioned that there was no change in prices and only

2% of the respondents found out the decreases of price in milk and dairy products. According to the respondents when covid-19 was conducted, the price rise was caused by the closing of entrance and departure points between foreign nations, which resulted in a lack of dairy goods on the market, which led in a price increase. Aside from that, grocery shops near the houses of respondents who live in the rural are offering more costly dairy goods as a result of the higher expenses of transportation to move supplies from the city centre to the countryside.

4.5.8 Distribution of actions that respondents took on the purchase of milk and dairy products during the Covid-19 outbreaks

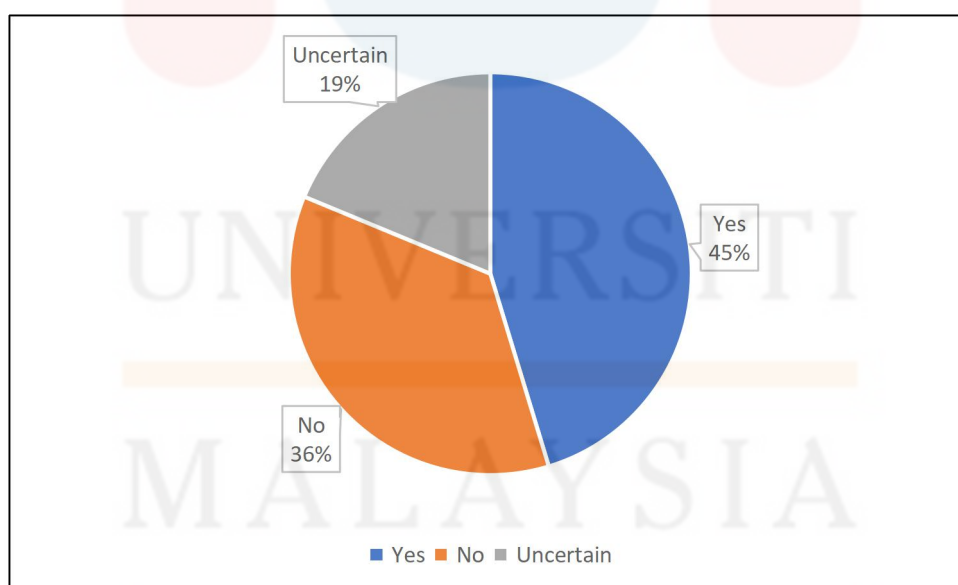


Figure 4.5.8: Percentage of respondents who reduced, did not reduce or were uncertain in their milk and dairy product purchase budgets during the Covid-19 outbreaks

Figure 4.5.8 shows that 45% of the respondents reduced their purchasing behaviour in milk and dairy products. About 36% of the respondents did not reduce their purchasing behavior and only 19% of the respondents were not sure if they reduced or not the purchasing behavior in milk and dairy product during Covid-19 outbreak. Almost half of those who answered the question mentioned that they cut down on their dairy product spending. This might be related to the fact that when covid-19 epidemic occurs, Sabah residence were frugal with their funds since the majority of Sabah people are self-employed. Because of the movement control orders issued during the Covid-19 epidemic, many Sabah people were unable to earn an income. As a result, this issue had an impact on the behaviours of respondents, who reduced their budget for the purchase of dairy products.

4.5.9 Distribution of changes in purchasing or consumption of milk and dairy products during Covid-19 outbreak.

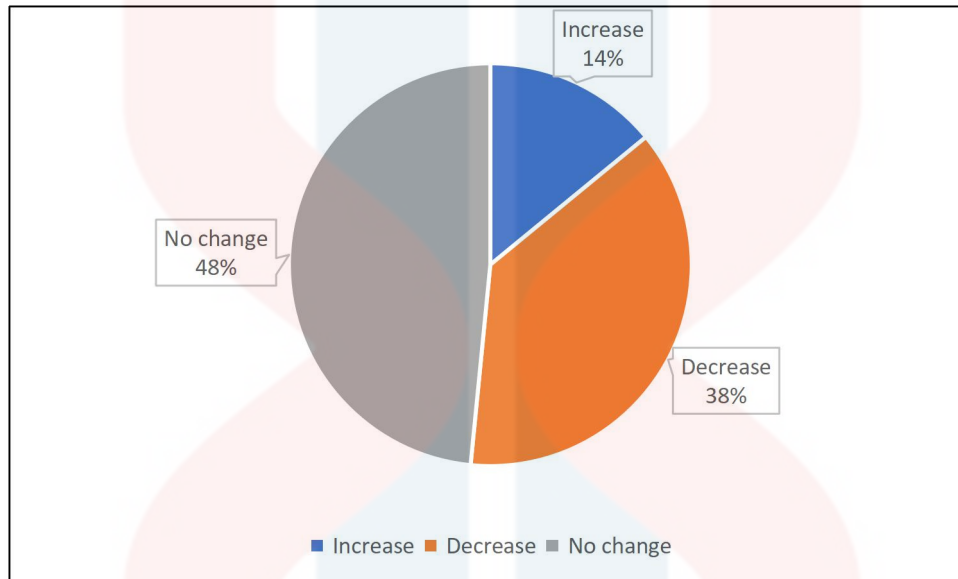


Figure 4.5.9: Percentage of respondents who changes their consumption on milk and dairy products during the covid-19 outbreaks

Figure 4.5.9 shows that 48% of the respondents did not change their consumption in milk and dairy products during the Covid-19 outbreak. Followed by 38% of the respondents decreased while 14% of the respondent increased. When Covid-19 outbreaks occurred, there were also respondents who increased their intake of milk and dairy products by a significant amount. When Covid-19 outbreaks, all members of the household were required to remain at home for the duration of the movement restriction order. Some members of the family have also reported an increase in milk consumption as a result of spending more time at home cooking and experimenting with new recipes.

4.5.10 Distribution of location or services that respondents used to get the milk and dairy product during Covid-19 outbreak.

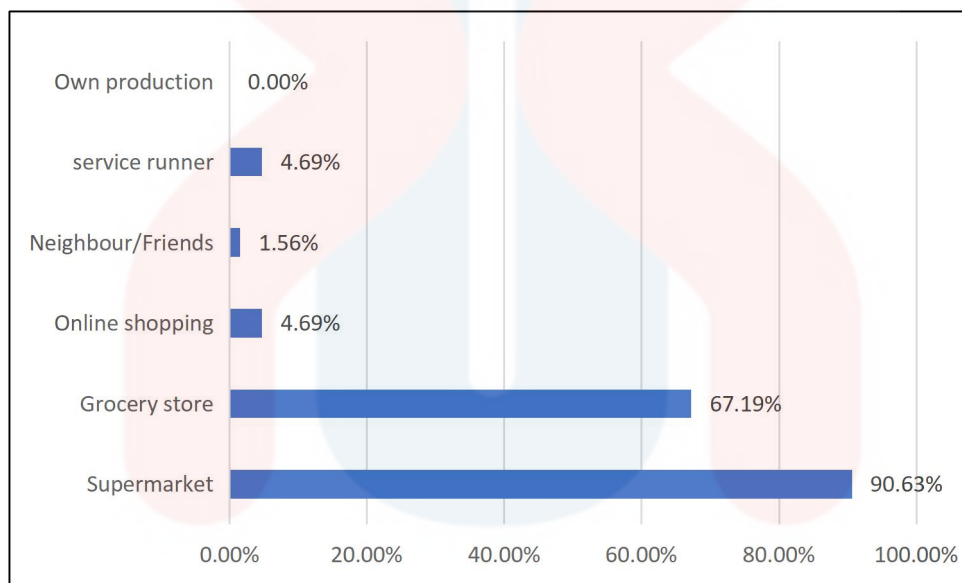


Figure 4.5.10: Percentage of locations or services that respondents used to get milk and dairy products

Figure 4.5.10 shows that almost all the respondents chose to go to supermarket to purchase milk and dairy products. About 67.19% of the respondents went to grocery store, 4.69% of the respondents used online shopping platforms and only 1.56% of the respondents asked friends and neighbour. When movement control orders are in place, only supermarkets are permitted to open their facilities. As a result,

a large number of respondents purchased basics from supermarkets and online retailers.

4.5.11 Distribution of media that respondents used to get the information during Covid-19 outbreak

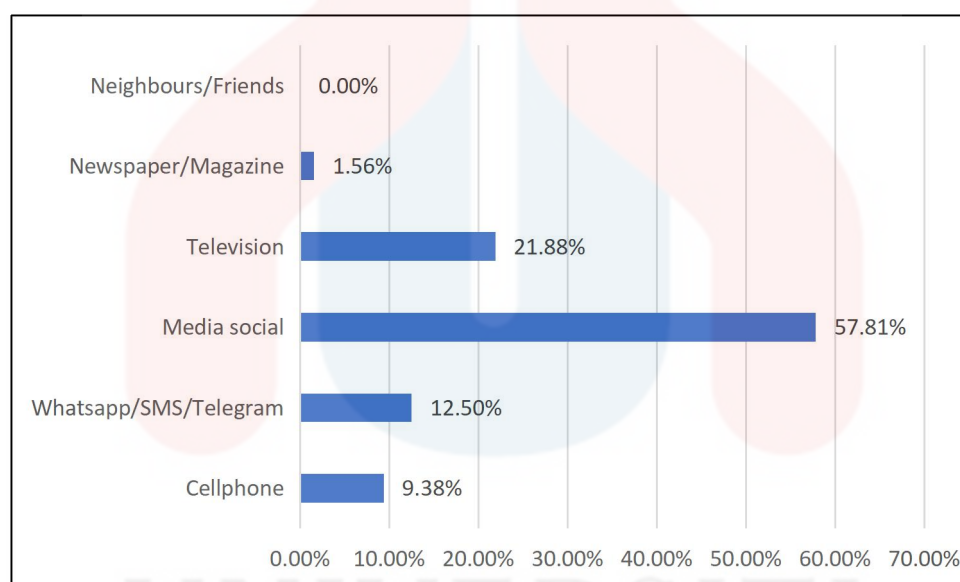


Figure 4.5.11: Percentage of media used to obtain information during the Covid-19 outbreaks

Figure 4.5.11 shows that 57.81% of the respondents used media social to obtained information during Covid-19 outbreak, followed by television 21.88% of the respondents, Whatsapp/SMS/Telegram 12.5% of the respondents, Cellphone 9.38% of the respondents and only 1.56% of the respondents used newspaper or magazine. Social media platforms are increasingly being utilised as a source of information,

particularly information about hazards and emergencies, and this is becoming more common. Social networking sites transmit information more quickly than any other type of communication. People may use social networking sites to strengthen their existing connections and develop new ones, among other things. 70 percent of adult social networking users go to the sites to interact with their friends and family, and more online contact helps to cement those bonds even further.

4.5.12 Distribution of communities’ changes during Covid-19 outbreak.

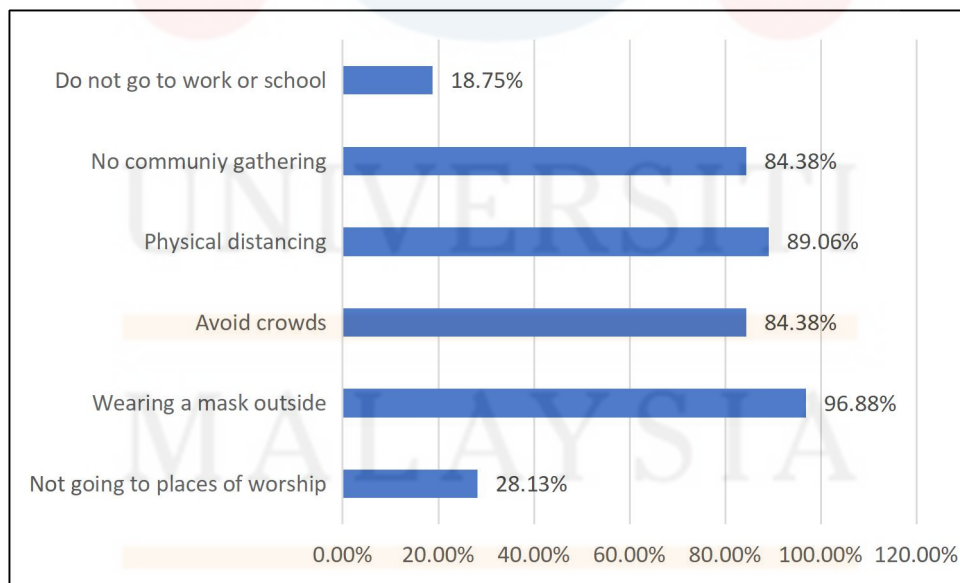


Figure 4.5.12: Percentage of communities changes during Covid-19 outbreaks

As shown in Figure 4.5.12, there were a lot of changes in communities during the COVID-19 outbreaks. Almost all of the respondents were wearing a mask outside, 84.38% of the respondents avoided crowds, 89.06% of the respondents kept 1-meter physical distancing from other people, 84.38% of the respondents mentioned that they did not go to any community gathering, 28.13% of the respondents did not go to places of worship and only 18.75% of the respondents did not go to work or school. With a major influence on human health, the COVID-19 pandemic has caused abrupt lifestyle changes, which have resulted in social alienation and isolation at home, with negative social and economic implications. It is necessary to have knowledge not only of medical and biological sciences, but also of all human sciences that are relevant to lifestyle, social, and behavioural studies, including food habits and way of life, in order to optimise public health during this pandemic. The dairy business is also impacted by the covid-19 epidemic, which affects everything from livestock care to production operations.

Table 4.5.13: Mean of the monthly consumption of dairy products based on different income level

Parameter	Income level (mean \pm standard deviation)				Average	P-value
	<RM2000	RM2001– RM3000	>RM3001 –RM4000	>RM5000		
1. Liquid/evaporated milk (g)	1153 ^{ab} \pm 1236	571 ^a \pm 719	481 ^a \pm 237	1850 ^b \pm 2192	1018 \pm 1250	0.076
2. Fresh milk (ml)	1398 ^a \pm 1408.34	1160.71 ^a \pm 1333.04	750 ^a \pm 955.06	2864.29 ^b \pm 2270.59	1425 \pm 1527	0.038
3. Condensed milk (g)	1048 \pm 1345	907 \pm 1004	512 \pm 248	1307 \pm 1734	978 \pm 1233	0.626
4. Powder/formula milk (g)	905 \pm 1286	675 \pm 597	500 \pm 621	1007 \pm 1103	815 \pm 1073	0.714
5. Sweetmeats (g)	576 \pm 679	578 \pm 496	271 \pm 116	478 \pm 328	527 \pm 567	0.572
6. Yogurt (g)	382 \pm 387	832 \pm 1574	271 \pm 116	392 \pm 304	468 \pm 801	0.284
7. Butter (g)	461 \pm 337	732 \pm 976	356 \pm 182	600 \pm 483	522 \pm 547	0.346
8. Ice cream (g)	670 ^{ab} \pm 844	532 ^{ab} \pm 484	281 ^a \pm 190	1207 ^b \pm 1716	650 \pm 879	0.215

^{ab} Means with different superscripts in a row differ significantly ($p < 0.05$).

The average monthly consumption of liquid/evaporated milk, fresh milk, condensed milk, powder/formula milk, sweetmeats, yogurt, butter, and ice cream of various household incomes were estimated at 1018g, 1425ml, 978g, 815g, 527g, 468g, 522g, and 650g. The distribution of respondents based on their dairy product consumption patterns revealed that 36.8 percent of them consumed only milk, 30.8 percent consumed milk with pulp, 25.5 percent consumed milk with beverages, and

0.6 percent consumed milk combined with oat, while the remaining 6.2 percent only consumed milk with medicine as may be prescribed by physicians, particularly when the respondents are undergoing medical therapy to suppress certain ailments (Adefalu, 2015).

Table 4.5.14: Mean of milk and dairy products expenditure based on different areas.

Parameter	Area (mean \pm standard deviation)			Average	P-value
	Rural	Town	City		
1. Liquid/evaporated milk (RM)	13.38 \pm 11.88	18.88 \pm 23.78	30.52 \pm 33.92	21.68 \pm 26.46	0.109
2. Fresh milk (RM)	20.94 \pm 27.33	28.84 \pm 56.60	30.74 \pm 28.24	27.55 \pm 42.19	0.766
3. Condensed milk (RM)	17.13 \pm 14.71	21.16 \pm 24.02	29.09 \pm 22.61	23.00 \pm 21.76	0.210
4. Powder/formula milk (RM)	17.31 \pm 19.06	28.40 \pm 31.75	39.57 \pm 49.10	29.64 \pm 37.25	0.183
5. Sweetmeats (RM)	16.00 \pm 13.82	27.04 \pm 42.07	28.04 \pm 26.56	24.64 \pm 31.49	0.452
6. Yogurt (RM)	8.69 \pm 9.33	11.96 \pm 14.80	16.87 \pm 23.88	12.91 \pm 17.72	0.350
7. Butter (RM)	14.88 \pm 10.94	17.28 \pm 16.87	20.04 \pm 20.57	17.67 \pm 17.00	0.647
8. Ice cream (RM)	12.38 \pm 8.93	20.16 \pm 20.59	48.96 \pm 111.93	28.56 \pm 69.29	0.201

The average monthly purchasing in rural, town, and city area of liquid milk/evaporated milk, fresh milk, condensed milk, powder/formula milk, sweetmeats, yogurt, butter, and ice cream were estimated at RM 21.68, RM 27.55, RM 23, RM

29.64, RM 28.04, RM 12.91, RM 17.67, and RM 28.56. According to Krishnada et al., liquid milk, curd and butter milk, butter and ghee, other milk products and total milk and milk products were the most expensive items for urban consumers, with 14.46 percent, 33.13 percent and 54.45 percent spending more than rural consumers on each item. Butter and ghee were the most expensive items for urban consumers, with 20.72 percent spending more than rural consumers on each item (Krishnada, 2015). The mean monthly purchasing of powder milk for all group of rural, town and city area were estimated RM 17.31, RM 28.4, and RM 39.57. The average monthly purchasing of powder milk is higher than other dairy products. The answer to this issue has been hinted at in private market reports, which found that 94% of millennial parents bought dairy milk in a three-month period in 2018 (Bryant, 2018).

Table 4.5.15: Mean of milk and dairy products consumption based on different areas.

Parameter	Area (mean \pm standard deviation)			Average	P-value
	Rural	Town	City		
1. Liquid/evaporated milk (g)	675 ^a \pm 558	802 ^{ab} \pm 788	1491 ^b \pm 1792	1018 \pm 1250	0.070
2. Fresh milk (ml)	844 \pm 9123	1659 \pm 1686	1576 \pm 1638	1425 \pm 1527	0.212
3. Condensed milk (g)	738 ^a \pm 1162	668 ^a \pm 504	1485 ^b \pm 1656	978 \pm 1233	0.046
4. Powder/formula milk (g)	378 ^a \pm 258	806 ^{ab} \pm 896	1130 ^b \pm 1461	815 \pm 1073	0.097
5. Sweetmeats (g)	365 ^a \pm 159	446 ^{ab} \pm 269	730 ^b \pm 870	527 \pm 567	0.091
6. Yogurt (g)	234 \pm 174	376 \pm 407	730 \pm 1230	468 \pm 801	0.124
7. Butter (g)	413 \pm 153	498 \pm 428	609 \pm 798	522 \pm 547	0.545
8. Ice cream (g)	434 \pm 257	664 \pm 962	785 \pm 1051	650 \pm 879	0.477

^{ab} Means with different superscripts in a row differ significantly ($p < 0.05$).

Table 4.5.15 shows the highest monthly consumption of milk and dairy products was in city areas followed by town and rural areas. The mean monthly consumption of liquid/evaporated milk, fresh milk, condensed milk, powder/formula milk, sweetmeats, yogurt, butter and ice cream in the city areas were estimated at 1491g, 1576ml, 1485g, 1130g, 730g, 730g, 609g, and 785g. Although the number of respondents in the town area is more than the number of respondents in the city region, the overall consumption of milk and dairy products is greater in the city area.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.0 Conclusion

In conclusion the results showed that most of the respondents chose F&N brand for liquid/evaporated milk and condensed milk followed by Marigold, dairy Champ, Gold Coin and Carnation. Respondents showed “Ducth Lady” as the highest preference for fresh milk among the brands, whereas Nestle was the highest for powder/formula milk, yogurt and ice cream. For sweetmeats, Cadbury was the highest preference among the other brands. About 42.19% of the respondents consumed not more than 500g liquid milk, 28.13% of the respondents consumed 500ml to 100ml of fresh milk, 39.06% of the respondents consumed not more than 500g of condensed milk, 39.06% of the respondents consumed not more than 500g of powder/formula milk, and more than half of the respondents in this study consumed sweetmeats, yogurt, butter and ice cream that not more than 500g.

5.1 Recommendation

Increasing Sabah's milk market volume may be possible by attracting more international investment into the dairy sector. As a result, the number of milk producers has increased, which has resulted in an increase in milk sales as well as work prospects for the people of Sabah, many of whom are believed to be lack of job opportunities. In order for children to be properly aware about the need of balanced diet, nutrition education should be integrated into the primary school academic curriculum. Additionally, providing milk to youngsters even during school closures due to the Covid-19 outbreaks shown to be quite beneficial in ensuring that students receive appropriate nourishment. It is necessary to increase the access to various milk products to enhance consumption, particularly in rural regions.

REFERENCES

- Al Sunni, A., & Latif, R. (2014). Effects of chocolate intake on Perceived Stress; a Controlled Clinical Study. *International journal of health sciences*, 8(4), 393– 401.
- Aidoo, Robert & Nurah, GK & Fialor, Simon & Ohene-Yankyera, Kwasi. (2009). Determinants of dairy consumption expenditure in urban communities of Southern Ghana. *Journal of Science and Technology (Ghana)*. 29.10.4314/just.v29i1.46444.
- Adefalu, L.L., Aderinoye-Abdulwahab, S.A., Aliwajud-Adewusi, M.B., Olabanji, P., Mayowa, & Adebowale, E.A. (2015). Sains Humanika Influence and Consumption Pattern of Dairy Products on Nutritional and Health Development of School-aged Children in Ekiti Local Government Area of Kwara State, Nigeria.
- Ahmed, M.A.M., Ehui, S., Yemesrach Assefa, (2006). Dairy development in Ethiopia. EPTD Discussion Paper No. 123. International Food Policy Research Institute. Washington, DC 20006 U.S.A.
- Ates, Hacer & Ceylan, Melike. (2010). Effects of socio-economic factors on the consumption of milk, yoghurt, and cheese : Insights from Turkey. *British Food Journal - BR FOOD J*. 112. 234-250. 10.1108/00070701011029110.
- Burger, K. S., & Stice, E. (2012). Frequent ice cream consumption is associated with reduced striatal response to receipt of an ice cream-based milkshake. *The American journal of clinical nutrition*, 95(4), 810–817. <https://doi.org/10.3945/ajcn.111.027003>
- Cardiovascular Disease, Diabetes, and Total Mortality. *PloS one*, 11(6), e0158118. <https://doi.org/10.1371/journal.pone.0158118>
- Chris Gale, Karen M Logan, Shalini Santhakumaran, James RC Parkinson, Matthew J Hyde, Neena Modi. (2012). Effect of breastfeeding compared with formula feeding on infant body composition: a systematic review and meta-analysis, *The American Journal of Clinical Nutrition*, Volume 95, Issue 3, March 2012, Pages 656–669, <https://doi.org/10.3945/ajcn.111.027284>
- Cifelli, C. J., Agarwal, S., & Fulgoni, V. L., 3rd (2020). Association of Yogurt Consumption with Nutrient Intakes, Nutrient Adequacy, and Diet Quality in American Children and Adults. *Nutrients*, 12(11), 3435. <https://doi.org/10.3390/nu12113435>
- Dr. Rafiq Idris. (2021, Januari 11). The Sabah economic model: A general overview. Retrieved from <https://www.ums.edu.my/v5/en/featured/10268-the-sabah-economic-model-a-general-overview>
- Delalic, Adela & Taljic, Irzada. (2019). Differences in consumption of milk and dairy products in adolescent diet according to the gender and the place of residence. 7. 37-42.
- Dainelli L, Xu T, Li M, et al. Cost-effectiveness of milk powder fortified with potassium to decrease blood pressure and prevent cardiovascular events among the adult population in China. (2017). doi: 10.1136/bmjopen-2017-017136
- Ethgen, O., Hiligsmann, M., Burlet, N., & Reginster, J. Y. (2016). Cost-effectiveness of personalized supplementation with vitamin D-rich dairy products in the prevention

- of osteoporotic fractures. *Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*, 27(1), 301–308.
<https://doi.org/10.1007/s00198-015-3319-3>
- Gabriela Possa, Michelle Alessandra de Castro, Dirce Maria Lobo Marchioni, Regina Mara Fisberg, Mauro Fisberg. (2015) Probability and amounts of yogurt intake are differently affected by sociodemographic, economic, and lifestyle factors in adults and the elderly—results from a population-based study, *Nutrition Research*, Volume 35, Issue 8, 2015, Pages 700-706, <https://doi.org/10.1016/j.nutres.2015.05.020>.
- Gagliardi, A., Maranhão, R., Sousa, H. et al. (2010). Effects of margarines and butter consumption on lipid profiles, inflammation markers and lipid transfer to HDL particles in free-living subjects with the metabolic syndrome. *Eur J Clin Nutr* 64, 1141–1149 (2010). <https://doi.org/10.1038/ejcn.2010.122>
- Iversen, K. (2020). Before the pandemic, oat milk was on the rise now it's everywhere. Retrieved from <https://www.refinery29.com/en-us/2020/12/10221842/oat-milk-rise-covid-willas-kitchen>
- Juffrie M, Sartika RAD, Sparringa RA, Wibowo L, Lukito W. (2020). Consumption patterns of sweetened condensed milk in the diet of young Indonesian children and its potential nutritional health consequences. *Asia Pacific Journal of Clinical Nutrition*. 2020 ;29(1):16-26. DOI: 10.6133/apjcn.202003_29(1).0003. PMID: 32229437
- Jabber, M. A. & Raha, S. K., (1984). Consumption pattern of milk and milk products in bangladesh. *bangladesh journal of agricultural economics, bangladesh agricultural university*, vol. 7(2), pages 1-16, December. <https://ideas.repec.org/a/ags/bdbjaf/212356.html>
- Krishnadas, M., PK, Dixit, Sivaram, Muniandy, Achoth, Lalith, MCA, & Devi. (2016). Consumption pattern of milk and milk products in rural and urban areas of Kerala. *Indian Journal of Dairy Sciences*. 69. 207-213.
- Kalyankar, Shrikant, Deshmukh, Mahesh, Khedkar, & Chandraprakash. (2016). Condensed milk.
- Lordan, R., Tsoupras, A., Mitra, B., & Zabetakis, I. (2018). Dairy fats and cardiovascular disease: do we really need to be concerned?. *foods (Basel, Switzerland)*, 7(3), 29. <https://doi.org/10.3390/foods7030029>
- Lucey, John A. PhD Raw Milk Consumption, *Nutrition Today*: July/August 2015 - Volume 50 - Issue 4 - p 189-193 doi: 10.1097/NT.000000000000108
- Mohammed, Rezgar. (2020). Eurasian the impact of income on household expenditure on dairy products: evidence from the united states dairy market. *Journal of Economics and Finance; Istanbul Vol. 8, Iss. 1, (2020): 16-23*. DOI:10.15604/ejef.2020.08.01.002
- Matin, Md, Chanda, Tanni, Munna, G., Islam, Md Ashraf & Omar, Md. (2020). Consumers' preference index of some selected sweetmeat products available in Bangladesh. 4. 12-18.
- Melesse K., & Beyene F., (2009). Consumption pattern of milk and milk products in Ada'a woreda, East Shoa Zone, central Ethiopia. *Livestock Research for Rural*

Development. Volume 21, Article #56. Retrieved January 21, 2022, from <http://www.lrrd.org/lrrd21/4/mele21056.htm>

- Gavhane, N., Khunt A., & Ardeshtna, N. J. (2013). Consumption Pattern of Milk and Milk Products and its Determinants: A Case of Junagadh District. *Indian Journal of Agricultural Marketing*. 27. 142-159.
- Njarui, D. M., Gatheru, M., Wambua, J. M., Nguluu, S. N., Mwangi, D. M., & Keya, G.A. (2011). Consumption patterns and preference of milk and milk products among rural and urban consumers in semi-arid Kenya. *Ecology of food and nutrition*, 50(3), 240–262. <https://doi.org/10.1080/03670244.2011.568908>
- National Research Council (US) Committee on Technological Options to Improve the Nutritional Attributes of Animal Products. *Designing Foods: Animal Product Options in the Marketplace*. Washington (DC): National Academies Press (US); 1988. *Processing Technologies for Improving the Nutritional Value of Dairy Products*. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK218186/>
- National Medical Association (2009). Lactose intolerance and African Americans: implications for the consumption of appropriate intake levels of key nutrients. *Journal of the National Medical Association*, 101(10 Suppl), 5S–23S. [https://doi.org/10.1016/s0027-9684\(15\)31090-7](https://doi.org/10.1016/s0027-9684(15)31090-7)
- Nouh, Faiza, Omar, Mariam, Alshukri, Amal, Elmabsout, Ali, Younis, Manal, Almahdi, Amira, Yousif, & Kholoud. (2017). ISSN 2347-954X (Print) Comparison of the Nutritive Values of Different Types of Evaporated Milk Available in Local Marketing in Benghazi City, Libya. 5. 2188-2197
- Oskar Adolfsson, Simin Nikbin Meydani, Robert M Russell. (2004). Yogurt and gut function, the american journal of clinical nutrition, Volume 80, Issue 2, August 2004, Pages 245- 256, <https://doi.org/10.1093/ajcn/80.2.245>
- Pimpin, L., Wu, J. H., Haskelberg, H., Del Gobbo, L., & Mozaffarian, D. (2016). Is Butter Back? A Systematic Review and Meta-Analysis of Butter Consumption and Risk of
- Rizzoli R. (2014). Dairy products, yogurts, and bone health. *The American journal of clinical nutrition*, 99(5 Suppl), 1256S–62S. <https://doi.org/10.3945/ajcn.113.073056>
- Syed Mansha Rafiq and Syed Insha Rafiq (May 30th 2019). *Milk By-Products Utilization, Current Issues and Challenges in the Dairy Industry*,
- Salam A. Ibrahim, Tahl Zimmerman & Rabin Gyawali, IntechOpen, DOI: 10.5772/intechopen.85533. Available from: <https://www.intechopen.com/chapters/67442>
- Suntharalingam, C. (2019), ‘Marketing Mix of Milk and Dairy Products in Peninsular Malaysia’, in Kusano, E. (ed.), *Food Value Chain in ASEAN: Case Studies Focusing on Local Producers*. ERIA Research Project Report FY2018 no.5, Jakarta: ERIA, pp.116–133.
- Deosarkar, SS., Kalyankar, Shrikant, Khedkar, Chandraprakash. (2016). Ice cream: Composition and health effects.
- Silanikove, N., Leitner, G., & Merin, U. (2015). The Interrelationships between Lactose Intolerance and the Modern Dairy Industry: Global Perspectives in Evolutional and

Historical Backgrounds. *Nutrients*, 7(9), 7312–7331.
<https://doi.org/10.3390/nu7095340>

- Tan, K. Y., van der Beek, E. M., Kuznesof, S. A., & Seal, C. J. (2016). Perception and understanding of health claims on milk powder for children: A focus group study among mothers in Indonesia, Singapore and Thailand. *Appetite*, 105, 747–757.
<https://doi.org/10.1016/j.appet.2016.06.034>
- Ullah, I., Ali, A., Ullah, W., Ali, A., Suhail, M., Haider, I., Babar, I., & Khan, M., (2021). An estimation of expenditures, own and cross price elasticities of milk in pakistan.
- Xu, J.; Wang, J.; Li, C. (2020). Impact of Consumer Health Awareness on Dairy Product Purchase Behavior during the COVID-19 Pandemic. *Sustainability* 2022, 14, 314. <https://doi.org/10.3390/su140103>

UNIVERSITI
MALAYSIA
KELANTAN

FYP FIAT

APPENDIX



Consumption pattern of milk and milk products among different income level in rural, district and city areas of Sabah, Malaysia during COVID-19 pandemic

Dear Sir/ Madam/ Miss,

Tuan / Puan / Cik,

This research survey is conducted for my research fulfilment. The objectives of this study are:

Kajian penyelidikan ini dijalankan untuk memenuhi kajian saya. Objektif kajian ini adalah:

- To determine the consumption pattern of milk and dairy products during covid-19 outbreaks. *(Untuk menentukan corak penggunaan susu dan produk tenusu ketika wabak covid-19)*
- To determine expenditure of milk and dairy products from three different area in Sabah. *(Untuk menentukan perbelanjaan susu dan produk tenusu dari tiga kawasan berbeza di Sabah)*
- To analyse relationship between consumption pattern of milk and dairy product with different household income level. *(Menganalisis hubungan antara corak penggunaan susu dan produk tenusu dengan tahap pendapatan isi rumah yang berbeza)*

PART A/ BAHAGIAN A

CONSUMERS' DEMOGRAPHY CRITERIA. / KRITERIA DEMOGRAFI PENGGUNA.

Tick [/] at the box. /Sila tandakan [/] dalam kotak yang disediakan.

1) Name / Nama:

2) Age / Umur:

3) Gender / Jantina:

4) In what area do you live? / Dimanakah Kawasan penempatan anda

a. Rural / Pedalaman

b. Town / Pekan

c. City (urban) / Pusat bandar

5) Number of family members. / Bilangan ahli keluarga. State the number / Nyatakan jumlah

a. Children (1 – 12 years) / Kanak-kanak(1-12tahun):.....

b. Teen Ager (13-19 years) / Remaja (13-19 tahun):.....

c. Adult (20-59 years) / Dewasa (20-59 tahun):.....

d. Old (>60 years) / Warga emas (>60 tahun):

6) Monthly income (RM) of household. / Pendapatan bulanan (RM) isi rumah

a. Below 2K / bawah 2K

b. >RM2K to <RM3K / >RM2K hingga <RM3K

c. >RM3K to <RM4K / >RM3K hingga <RM4K

d. >RM4K to <RM5K / >RM4K hingga <RM5K

e. >RM5K / >RM5K

7) What is the last graduated school? / Apakah sekolah tamat pengajian terakhir?

a) primary school / Sekolah rendah

b) vocational school / Sekolah vokasional

c) High school / Sekolah menengah

d) University / Universiti

e) Others / *Lain-lain*

PART B / Bahagian B

8) Monthly consumption of household on milk and milk products. State the amount. / *Penggunaan bulanan isi rumah pada susu dan produk susu. Nyatakan jumlahnya*

- a. Liquid milk / *Susu cair* (litre):.....
- b. Condensed milk / *Susu pekat* (gram):.....
- c. Powder milk / *Susu serbuk* (gram):
- d. Sweetsmeats / *Manisan* (gram):
- e. Yogurt / *yogurt* (gram):
- f. Butter / *Mentega* (gram):
- g. Ice cream / *Ais krim* (gram):
- h. Fresh milk / *Susu segar*:

PART C / Bahagian C

9) Monthly expenditure of household on milk and milk products. State the amount. / *Perbelanjaan bulanan isi rumah untuk susu dan produk susu. Nyatakan jumlahnya*

- a. Liquid milk / *Susu cair*: RM.....
- b. Condensed milk / *Susu pekat*: RM.....
- c. Powder milk / *Susu serbuk*: RM.....
- d. Sweetmeats / *Manisan*: RM.....
- e. Yogurt / *yogurt*: RM
- f. Butter / *Mentega*: RM
- g. ice cream / *Ais krim*: RM.....
- h. Fresh milk / *Susu segar*: RM.....

PART D / Bahagian D

10) Which brands of milk and milk products do you always buy? State the brand / *Jenama susu dan produk susu yang manakah anda selalu beli? Nyatakan jenama*

- a. Liquid milk / *Susu cair*:

- b. Condensed milk / *Susu pekat*:
- c. Powder milk / *Susu serbuk*:
- d. Sweetmeats / *Manisan*:
- e. Yogurt / *Yogurt*:
- f. Butter / *Mentega*:
- g. Ice cream / *Ais krim*:
- h. Fresh milk / *Susu segar*:

PART E / BAHAGIAN E

RESPONDENTS CONSUMPTION AND PURCHASING BEHAVIOUR TOWARDS MILK AND DAIRY PRODUCTS DURING COVID-19 OUTBREAKS RESPONDEN. / PENGGUNAAN DAN TINGKAH LAKU PEMBELIAN TERHADAP SUSU DAN PRODUK TENUSU SEMASA WAKTU COVID-19

Tick [/] at the box. / Sila tandakan [/] dalam kotak yang disediakan.

11) In the last 2 years did you increase, decrease or maintain your family’s household purchasing of milk and milk products? / *Dalam 2 tahun kebelakangan ini, adakah anda menambah, mengurangkan atau mengekalkan pembelian susu dan produk susu seisi rumah anda?*

- a. Increase / *Meningkat*
- b. Decrease / *Menurun*
- c. Maintains / *Tiada perubahan*

12) During COVID-19 pandemic did you increase, decrease or maintain your family’s household purchasing of milk and milk products? / *Semasa wabak COVID-19 adakah anda meningkatkan, mengurangkan atau mengekalkan pembelian susu dan produk susu seisi rumah anda?*

- a. Increase / *Meningkat*
- b. Decrease / *Menurun*
- c. Maintains / *Tiada perubahan*

13) Where does your family’s household buy milk and milk products during COVID-19 pandemic? / *Di manakah isi rumah keluarga anda membeli susu dan produk susu semasa wabak COVID-19?*

- a. market / *pasar raya* (hypermarkets, supermarkets)
- b. Online shopping / *Membeli-belah dalam talian* (Shopee, Lazada etc)
- c. Runner service / *Servis runner* (grab, food panda etc)
- d. Retailer store / *kedai runcit*
- e. Neighbours/friends / *Jiran dan kawan-kawan*
- f. Own production / *Hasilkan sendiri*
- g. other places (please specify):

14) Have there been any changes on price of milk and milk products during the COVID-19 pandemic? / *Adakah terdapat sebarang perubahan pada harga susu dan produk susu semasa pandemik COVID-19?*

- a. Increase / *Meningkat*
- b. Decrease / *Menurun*
- c. Maintains (no change) / *Tiada perubahan*

15) Does your family's household reduce the budget to buy the milk and milk products during COVID-19 pandemic? / *Adakah isi rumah keluarga anda mengurangkan belanjawan untuk membeli susu dan produk susu semasa wabak COVID-19?*

- a. Yes / *Ya*
- b. No / *Tidak*

16. What factors would affect your choice for purchasing dairy products? Please tick the appropriate answer (Multiple Choice). / *Apakah faktor yang akan mempengaruhi pilihan anda untuk membeli produk tenusu? Sila tandakan jawapan yang sesuai (Aneka Pilihan)*

- a. Taste / *Rasa*
- b. Quality / *Kualiti*
- c. Brand / *Jenama*
- d. Price / *Harga*

- e. Reputation / *Reputasi*
- f. Sales Location / *Lokasi penjualan*
- g. Packaging / *Bungkusan*
- h. Nutrients Value / *Kandungan nutrisi*

17) What is the range of dairy products most consumed by you? / *Apakah rangkaian produk tenusu yang paling banyak digunakan oleh anda?*

- a) Natural yoghurt and yoghurt with fruits / *Yogurt asli dan yogurt dengan buah-buahan*
- b) Cream / *Krim*
- c) Cheese / *Keju*
- d) Butter / *Mentega*

18) How often do you buy milk or dairy products? / *Berapa kerap anda membeli susu atau produk tenusu?*

- a) Daily / *Setiap hari*
- b) Weekly / *Setiap minggu*
- c) Monthly / *Setiap bulan*
- d) Occasional / *Sekali sekala*

19. How often do you drink milk? / *Berapa kerap anda minum susu*

- a) Daily / *Setiap hari*
- b) 2-3 days / *2-3 hari*
- c) 1-2 weeks / *1 – 2 minggu*
- d) Monthly / *Setiap bulan*

e) Never / *Tidak pernah*

20) What are the media that your family's household use to receive information during the COVID-19 pandemic? / *Apakah media yang digunakan seisi keluarga anda untuk menerima maklumat semasa wabak COVID-19?*

- a. Telephone / *Telefon*
- b. Whatapps/SMS / *whatsapp/SMS*
- c. Social media / *Media sosial* (Facebook, Instagram, Twitter etc)
- d. Television/news / *Televisyen/Berita*
- e. Neighbours/relatives / *Jiran/Keluarga*

21) Changes in communities during COVID-19. / *Perubahan dalam komuniti semasa COVID-19.*

- a. Not going to places of worship / *Tidak mengunjungi ibadah*
- b. Wearing a mask outside / *Memakai pelitup muka di luar*
- c. Avoid crowds / *Mengelakkan kesesakan*
- d. Physical distancing / *Penjarakan fizikal*
- e. No community gathering / *Tidak berhimpun*

22) The purpose of using milk / *Tujuan menggunakan susu*

- a) For Coffee/ Tea / *Untuk kopi/tea*
- b) For Sweets / *Untuk manisan*
- c) For drinking / *Untuk minuman*

23) What do you do when price increases? / *Apakah yang anda lakukan apabila harga meningkat*

- a) Change in brand / *Ubah jenama*
- b) Change in type of milk / *Ubah jenis susu*

c) Decrease in purchase of amount of milk / *Mengurangkan perbelanjaan susu*

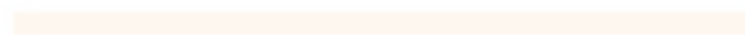
d) Don't do anything / *Tidak melakukan apa-apa*



UNIVERSITI



MALAYSIA



KELANTAN