

MUSLIM CONSUMERS' AWARENESS LEVELS ON HALAL VINEGAR PRODUCTS: A CASE STUDY IN SELANGOR

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Abstract	<i>Vinegar is one of the oldest condiments used to this day. The Muslim community considers vinegar a halal product because the Prophet Muhammad (S.A.W) used it as a condiment. However, the ruling of vinegar is not explicitly mentioned in the al-Quran and al-Hadith and even the al-Quran does not specifically mention vinegar, unlike the khamr in which the rule is qat'i (clear). The absence of these clear guidelines has led to controversy among consumers, where some users were aware of the halal status of vinegar while others are not concerned about it. In this regard, this research aims to study the awareness and concern of Muslim consumers on halal vinegar products in Selangor, Malaysia. A total of 241 users from nine districts in Gombak, Hulu Langat, Hulu Selangor, Klang, Kuala Langat, Kuala Selangor, Petaling, Sabak Bernam and Sepang were selected as respondents using the random sampling method. The information was collected using questionnaire and Google Doc form which was completed by the respondents. The data obtained were analyzed using Statistical Package for Social Sciences (SPSS). The survey found that almost half of the respondents (46.1%) were aware of the existence of various types of vinegar in the Malaysian market. The majority of respondents were very careful in choosing a halal product especially in vinegar product where 90.9% of the respondents only chose halal Muslim vinegar products. However, only 36.1% of the respondents were aware of the product produced through the process of fermentation such as vinegar containing alcohol and therefore only 34.4% found that vinegar also contained alcohol and the level of consumer awareness of the alcohol limit allowed in food and beverages was just 28% of all respondents. However, the majority of respondents were aware that the percentage of alcohol contained in the product will affect the halal status of the product. 53.9% of respondents were aware of the influence while 23.7% were unaware and 22.0% were uncertain. Overall, respondents believe that halal-based vinegar products are guaranteed, so this study implies that the government should enforce the use of halal logos in each product as well as state the alcohol content in the products produced through the fermentation process.</i> Keywords: <i>Market, Consumer, Awareness, Vinegar, Halal.</i>
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INTRODUCTION

Vinegar has been used by humans for several generations in thousands of years ago in various everyday uses (Langworthy, 1907) such as culinary ingredient in the production of various foods in the Arabian, European and even archipelago continents. Emily Thacker argues that vinegar was a condiment used in ancient Egypt before the time of Pharaoh, Babylon and Persia, when they used vinegar as the main ingredient to ferment food to ensure it would last for a long time in a long journey and it was also used as thirst-quencher (Thacker, 2010).

Meanwhile, in Ancient Greece it was a beverage believed to give strength and courage to the soldiers named *Posca* and *Oxycrat* (Bell, 1859). According to Thompson (2014), the first vinegar was made from alcohol about 7000 years ago and used as a flavouring and preservative (as in pickling). It can be made from any substrate that can undergo fermentation of alcohol and it is also used in food and beverages and is even used as a cure for some diseases such as helping to prevent the development of swelling-related diseases such as boils and cancer (Steinkraus, 1996).

Nowadays vinegar is generally used in the food product, early research found that vinegar used as one of the main ingredients of various Malaysian food products such as Chili Cap Tamin sauce produced by Zamani Hj. Tamin Sdn Bhd, Lady's Choice Real Mayonnaise made by Unilever (Malaysia) Holdings Sdn Bhd, Brands A1 sauce produced by Riviera Trading Company Singapore and The Original HP Sauce produced by HP Foods Hayes Middx United Kingdom (Harahap, 2020). One of the most common foods used for daily usage is vinegar, which has been used in many types of foods, including snacks such as pickle, to heavy foods such as condiments to rice and breads, as mayonnaise and sauces.

According to Elasrag (2016) at Munich Personal RePEc Archive (MPRA) each year the demand for halal products is growing with the global food market accounting for more than 20% of the halal industry and demand for halal products is expected to increase by 70% by 2050. Among the products that are in high demand are vinegar. It is one of the most popular products in the world today from both Muslim countries like Saudi Arabia and Malaysia as well as from non-Muslim countries like America and the United Kingdom. Each country has begun to produce vinegar products and some other products that use vinegar as a major ingredient in their products such as sauces, soy sauce and mayonnaise. Vinegar can be used as a way to improve the quality of life and food (Lim et al., 2019).

Therefore, it is seen as one of the leading economic drivers of the country in line with demand and population growth worldwide with an estimated value of millions of dollars a year (Tan, 2005). Feyissa and Garomsa (2011) states, demand for vinegar is quite high for five consecutive years (2005-2009) at 79,926 liters. Demand continued to increase from 81,832 litres in 2010 to 105,754 litres in 2012. Demand for vinegar products is expected to increase by a total of 105,754 litres from 2017 to 2022.

However, with the increasing demand for vinegar products in the market and the widespread use of vinegar in the global food industry, it has lessened consumer concerns, especially as Muslim consumers have a preference for vinegar products that are *ḥalāl* and *ṭayyib*. Generally, public considers vinegar to be a halal food belonging to the *Sunnah* of the Prophet, therefore, they draw a simple conclusion that every vinegar product is halal and can be used, when the reality actually shows otherwise. In Malaysia, for example, the issue of wine vinegar is still widespread, and some people are still confused regarding its use.

Even though the Selangor State Fatwa Council had already banned the use of wine vinegar in June 2006, but to this day it has remained a controversial issue among consumers. In addition, some manufacturers have marketed their vinegar products even though they have not yet reached the mature fermentation stage, that the vinegar they produced still contain a high level of alcohol content that is not permissible in Islam.

SCOPE OF STUDY

The production of vinegar takes longer than *nabīdh* and *khamr*, as vinegar produced before it matures will contain high levels of alcohol and it considered haram to use. Generally, consumers are aware that alcohol is haram and they are also aware that foods and drinks containing alcohol are also haram to use. However, not all consumers are aware that products produced through fermentation such as vinegar also contain alcohol. Therefore, research on consumer awareness in the use of halal vinegar products is essential. Through this study, it is hoped that consumers, especially housewives and food service providers, will place importance on using halal vinegar products as an ingredient in various cuisines.

Therefore, this study aims to discover the level of consumer awareness of halal vinegar products in the Malaysian market. The study was conducted in the state of Selangor as the most advanced and richest state based on Gross Domestic Product (GDP) per capita with the rapid development of modernization in the Klang Valley area located in the heart of Peninsular Malaysia and having the largest population of diverse backgrounds with very high standard of living and lowest poverty rate compared to other states in Malaysia (Leete, 2005).

LITERATURE REVIEW

The issue of halal and haram is a major issue in human life as it is directly related to everyday life. The matters of halal are broad and covers various aspects while the matters of haram are small and limited (al-Sha'rāwī, 1991). Among the halal products that often used in daily life is vinegar. Vinegar is known as a magic ingredient that can be used in a variety of everyday uses.

It is not only used for the food and beverage industry (Ahmad, 2000) but it can also be considered as the best alternative to food preservatives, especially in developing countries where food preservation technologies are extremely scarce and difficult to find (Solieri and Giudici, 2009; Giudici et al., 2015). In addition, vinegar is also used as an ingredient in medicines, cosmetics, kitchen and toilet cleaning agents, germ killers and it can also be used as an alternative to Glyphosate used in exterminating pests and fertilizers for plants such as vegetables and fruits (Fiola and Gill, 2017).

The production of consumer products especially involving vinegar-based food and beverage products is widespread throughout the world. The phenomenon is because vinegar is an acetic acid or ethanoic weak organic chemical compound that has a characteristic sour taste that is suitable to be used in a variety of foods and drinks and also for other uses (Abd Rashid and Sharifuddin, 2016).

Vinegar is one of the oldest products produced through the double fermentation process. It is an inseparable process in the production of vinegar, where it is a key ingredient in the production of vinegar. This step is crucial in turning sugar into alcohol in the first fermentation process followed by alcohol conversion process into acetic acid in the second step (Breidt et al., 2013). As a product produced through the fermentation process, vinegar will always have issue with the alcohol, because each product that undergoes fermentation will contain alcohol whether intentionally or unintentionally (Sanchez, 2008).

THE RATE OF ALCOHOL CONTENT PERMISSIBLE IN FOOD AND BEVERAGES

Alcohol is a chemical compound that can be harmful to human health. Islam has established that every food and drink that can be harmful to humans is haram. In this case, all food and beverage products containing alcohol are also prohibited whether in small or large quantities as they can be harmful in terms of health or rational thinking. Essentially, vinegar is a halal product that has been used for thousands of years and it is even a condiment favoured by earlier prophets. Islam has decreed that something that is halal will not be haram unless there is a reason to ban it. In this case, vinegar is a halal product as it is a byproduct of fermentation. However, the vinegar's halal status can be

questionable if it contains alcohol. The alcohol content in this vinegar product comes as a result of the conversion of sugar into alcohol in the first fermentation process called *takhammur* and followed by *takhallul*, which is the process of converting alcohol into acetic acid. The process of making the vinegar can be studied in Figure 1.

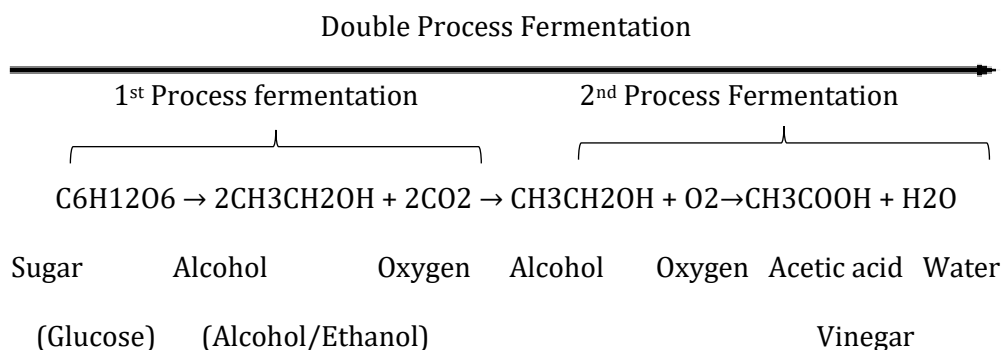


Figure 1: Double step fermentation process of vinegar product.

Based on Figure 1, vinegar is a product produced through double fermentation process, and if the product is produced by going through just one process, the product is not called vinegar but *khamr* (alcohol). In this case, there are some vinegar sellers who have sold their vinegar even though they are still in the *takhammur* process. Therefore, vinegar must be produced through two continuous processes.

Although Islam does not set the level of alcohol content permissible in vinegar products and neither does JAKIM nor the National Fatwa Council, the Malaysian National Fatwa Committee has determined that processed or manufactured soft drinks which are not intended to produce alcohol and have alcohol below 1% v/v is *mubāh* (permissible to be consumed) (JAKIM, 2015). Therefore, any vinegar produced by the fermentation process that does not contain 1% v/v alcohol it is permissible to used while vinegar exceeding the prescribed rate considered *shubhah* or even haram such as cider vinegar that contains alcohol in excess of 2% (v/v).

Alcohol is a group of colourless and sharp-smelling chemical compounds that are produced either by natural or synthetic fermentation based on ingredients with carbohydrate (Jamaludin, 2015). Alcohol is not only present in *khamr* but it can also be naturally present in fruits and additives such as vinegar (Ahmad and Wan Abdullah, 2014). Vinegar produced prior to the complete fermentation period will lead to poor quality of vinegar, while the alcohol content that is still in the process of being transformed into vinegar is also stifled and still contains high level of alcohol which leads to the implications of haram status. Vinegar which is classified as halal vinegar is made from halal sources through the complete process of fermentation that produces vinegar that is halal, void of alcohol and other *shubhah* elements.

One of the criteria to ensure halal vinegar it is free of impurities from alcohol. The alcohol produced during the fermentation process in vinegar is ethanol, a chemical compound that can cause intoxication and harm health. Ethanol is produced during the chemical transformation process due to the reaction of yeast or bacteria, thus transforming the sugar content into ethanol (*khamr*) during the first fermentation process.

Generally, the first fermentation process is the alcohol production process with high alcohol content while the second fermentation process is the production of vinegar. The production of vinegar goes through two different stages of fermentation but some sellers have already sold their products even though they are still in the early stages of making vinegar and they still have high levels of alcohol content because they are still in the process of brewing it. Some consumers are not aware of it because they have no knowledge of halal matter (Hifza and Mohd, 2010), especially when the products on the market do not have the halal logo.

Consumer awareness of halal products is an important part of the sustainability of the halal industry as it is one of the reasons to ensure that the products produced by the manufacturers according to the *sharīah* prescribed standards. Lack of knowledge and lack of awareness of halal products will result in products being marketed in the state of *shubhah* or even haram.

Therefore, consumers should look at several aspects before buying and using the products available in the market. They should look at the halal logo, expiration date, brand, composition, manufacturer, company and country of origin of the product and the alcohol content in the product. The study of consumer awareness in halal products is a key issue in determining the level of knowledge and adherence to *sharīah* claims. Lack of consumer awareness of halal products will lead to fraud and mismanagement of halal products thus opening the door for food industry players to falsify and fabricate illegal products that are marketed especially for products produced through long fermentation processes such as vinegar.

There have been several studies on halal awareness on current issues in various places, such as Muslim consumers' awareness and perception of halal food fraud by Ruslan, Kamarulzaman and Sanny (2018). The results showed that 96.9% of Muslim consumers in the Klang Valley, Malaysia were aware of the high level of halal products fraud. To discover the level of consumer awareness among non-Muslims, a survey of non-Muslim consumers' concern index on halal food products in Malaysia was conducted and this study found that consumer awareness among non-Muslims is well above 75% (Isa and Ahmad, 2015).

Studies on the level of halal products have also been conducted in a number of places especially in Muslim-majority countries such as Indonesia. In a study conducted by Muhammad Nusran et al. (2018) it was found that consumer awareness of halal products would create a system that could ensure security and consumers' health. A person's knowledge and understanding of what is happening around him creates the awareness to act in a way that suits his situation. Consumers' awareness of *sharīah* compliant practices will create a cautious attitude towards choosing food products so that only halal foods are chosen which can avoid *shubhah* and being careful about consuming food that do not have halal status such as products produced through long fermentation processes like vinegar.

The awareness of the importance of this halal product can also draw attention to non-Muslims who do not pay attention to the halal status of their diet to prioritize halal food because it is guaranteed to be clean, healthy and safe (Golnaz et al., 2010), as it has been in Russia and the Philippines. Non-muslim Russians and Filipinos are more likely to believe in halal products such as meat consumed by Muslims than non-Muslims. They believe that the meat that Muslims cultivate is fresh, tasty and safe to use because they believe in the process of slaughter and there are no elements of deception in the preparation as it relates to religion and belief that must be obeyed (Muhammad, 2007).

Increasing confidence among non-Muslims towards halal products will increase the country's income not only in the field of halal food but in other fields such as pharmaceuticals, cosmetics, skin care and other products used in daily life (Nuwairah et al., 2015). Although there are various studies conducted on consumer awareness of halal products, studies that are specific to foods produced through fermentation such as studies of consumer awareness of halal vinegar products used in daily meals have not been conducted. Therefore, this study was conducted to identify to which extent Muslim consumers in Selangor are aware of halal vinegar products.

MATERIALS AND METHODS

The study was conducted using random sampling in all nine districts in the state of Selangor: Gombak, Hulu Langat, Hulu Selangor, Klang, Kuala Langat, Kuala Selangor, Petaling and Sabak Bernam. The distribution of respondents by parliamentary constituency is shown in Table 1.

Parliament	Number of Respondents	Percentage (%)
Gombak	28	11.6
Hulu Langat	53	22.0
Hulu Selangor	19	7.9
Klang	24	10.0
Kuala Langat	26	10.8
Kuala Selangor	22	9.1
Petaling	25	10.4
Sabak Bernam	22	9.1
Sepang	22	9.1
Total	241	100

Table 1: Number of respondents in all nine districts in the state of selangor

The criteria set out in this study were focused on Muslim respondents only because some of them considered each vinegar to be a *sunnah* and halal food. The method used was the interview method in which respondents were asked to fill out the answer to the research question distributed in print or using the Google Docs website. The questions are divided into two sections, in which Part A covers the background of respondents and has five questions, while Part B includes questions about the level of knowledge and consumer awareness of halal vinegar and it has 10 questions.

The results from fieldwork were then analyzed using Statistical Package for Social Sciences (SPSS) software. The data collected were analyzed using descriptive analysis as well as the Chi-Square test. Descriptive analysis was used to see a summary of respondents' distribution and answers to each question while the Chi-Square test analysis is used to test the relationship between two variables. Therefore, the hypotheses built and tested in this study are as follows:

H₀: there was no significant relationship between the respondents' background and the awareness that the percentage of alcohol contained in the product produced would affect the halal status of the product.

H₁: there is a significant relationship between the respondents' background and the awareness that the percentage of alcohol contained in the product is likely to affect the halal status of the product.

RESULT AND DISCUSSION

Socio-demographic Profiles of Respondents

Background of the respondents interviewed were as follows: 32.4% were male and 67.2% were female while 0.4 % were unknown. The distribution of the respondents can be seen in the Figure 2.

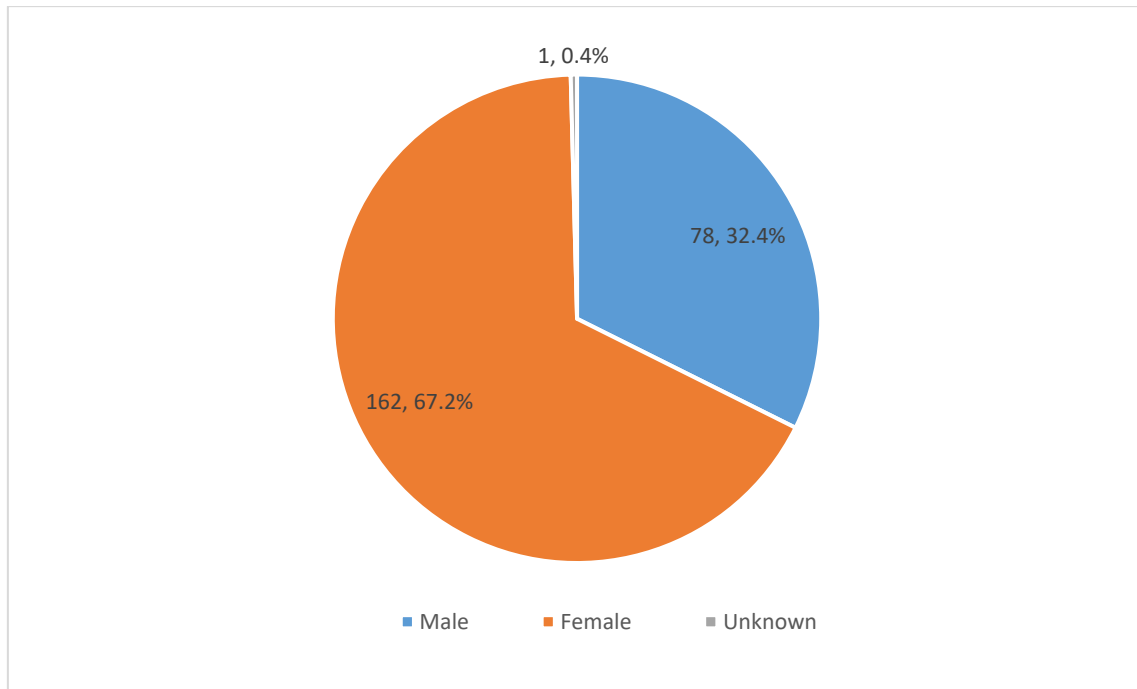


Figure 2: Gender of the respondents

Overall, the respondents were between 20-30 years old (86.3%) and the rest were between 31-40 years (5.4%) followed by 41-50 years (5.0%) and 51 years (2.5%). Ages between 20 to 30 years are typically the ones that reflect one's maturity in measuring, weighing and deciding things. To illustrate, the entire age of the respondents can be examined in Figure 3.

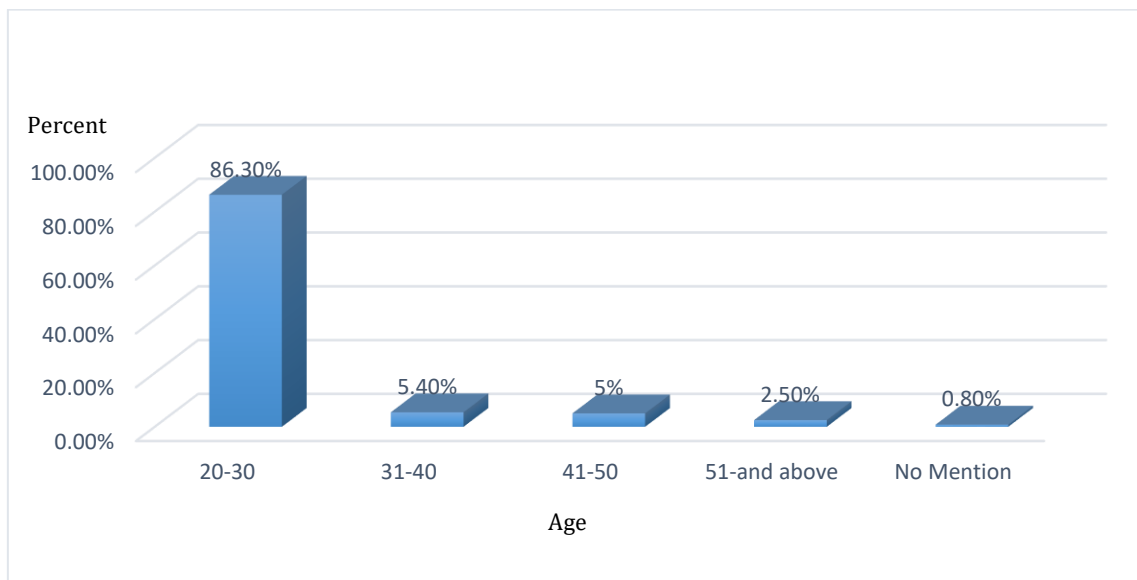


Figure 3: Age of respondent.

In terms of marital status, the majority of respondents interviewed were 76.3% single while 17.4% are married and other marital status was 6.2%. Respondents' marital status can be examined in Figure 4.

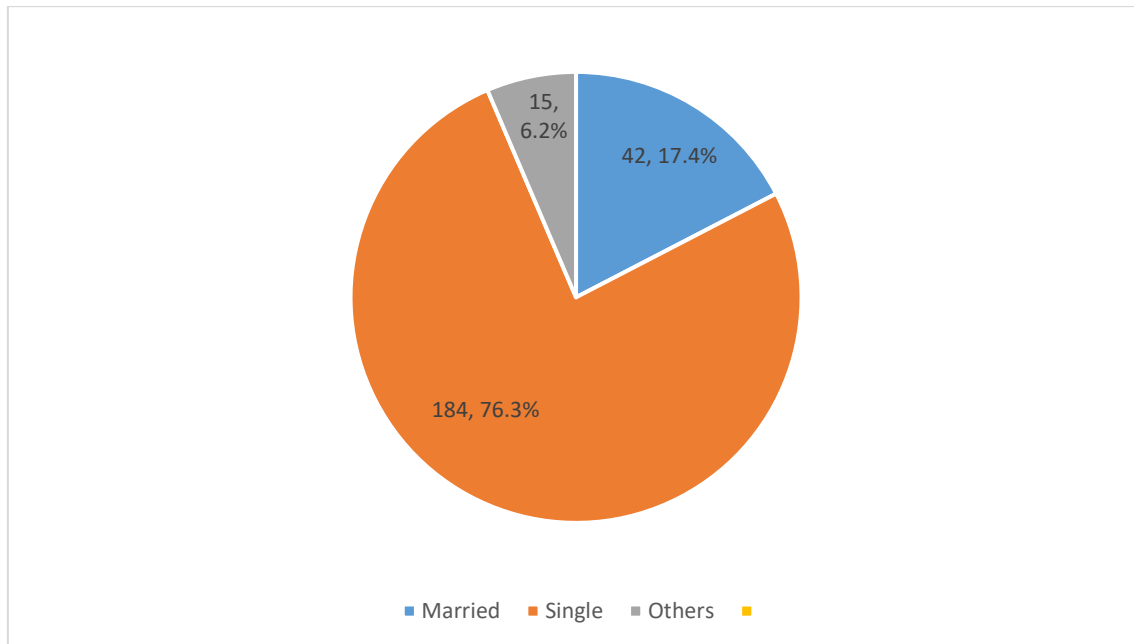


Figure 4: Marital status of the respondents.

In terms of education, the distribution of respondents was found to be balanced between those who had a Certificate (26.6%), a Diploma (27.8%) and a Bachelor's Degree (25.7%). To illustrate, the education level of the respondents can be examined in Figure 5.

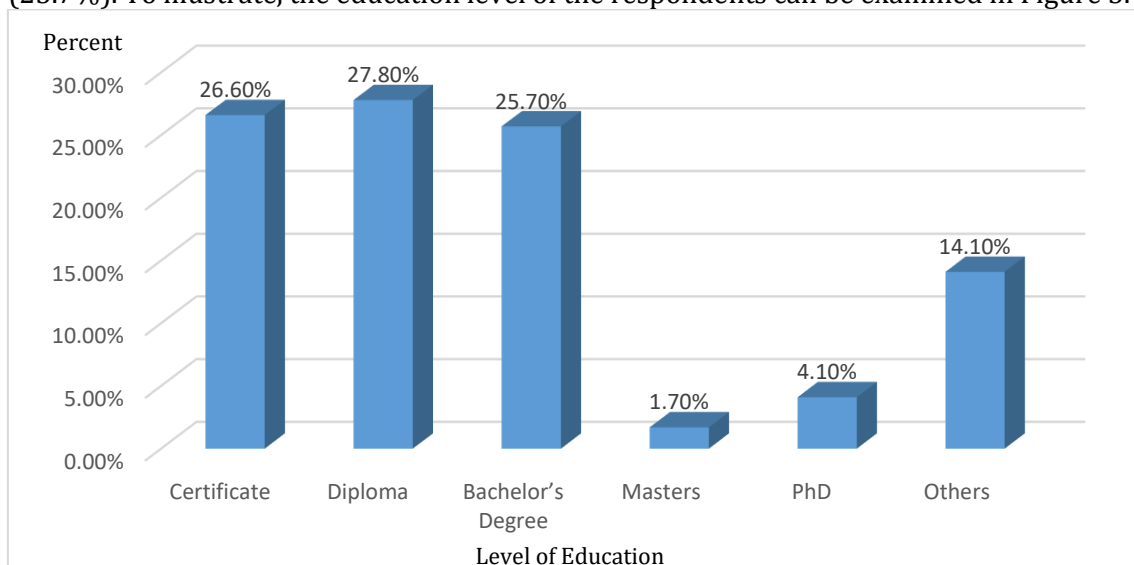


Figure 5: Level of education of the respondents.

User Knowledge of Vinegar and Logo Selection

Figure 6 shows respondents' knowledge of halal vinegar. The survey found that almost half of respondents (46.1%) were aware of the existence of various types of vinegar in the market in Malaysia. However, some respondents (29.9%) were unaware or uncertain (24.1%) of their existence.

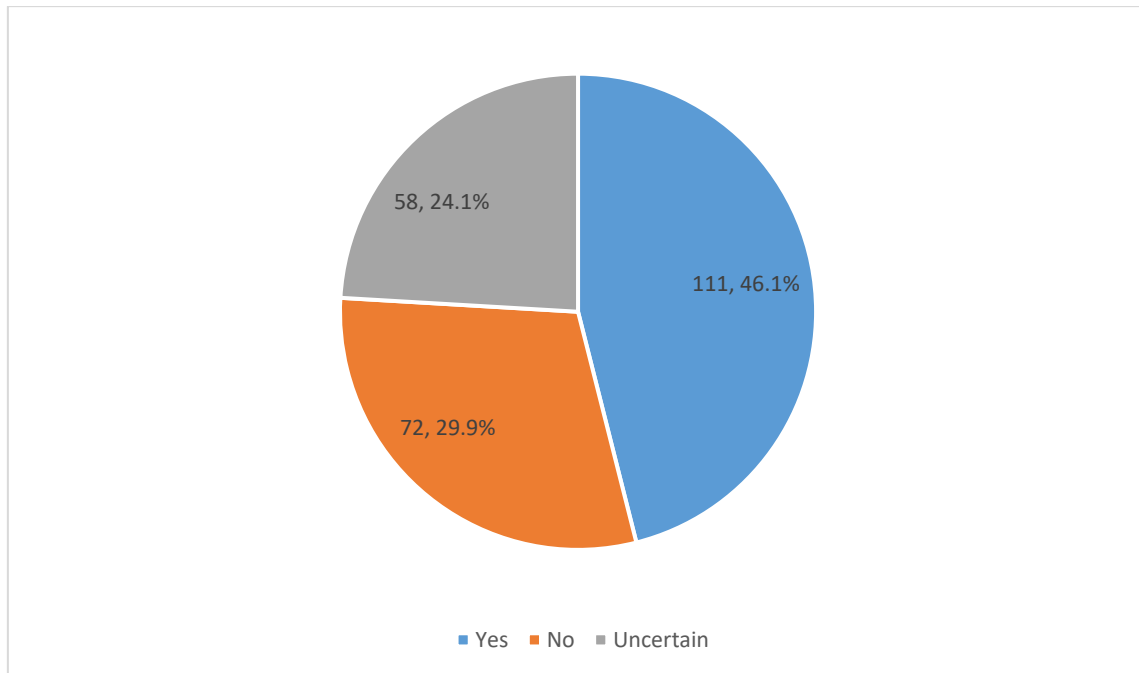


Figure 6: Level of awareness of the existence of various types of vinegar in the Selangor market.

Level of Knowledge of the Respondents Towards the Existence of Halal Vinegar in the Selangor Market.

Figure 7 shows respondents' knowledge towards the existence of halal vinegar in the Selangor market. The survey found that 29.9% of the respondents were unaware of the existence of halal vinegar, 24.1% of the respondents were uncertain, while almost half of the number of respondents 46.0% were known of the existence of halal vinegar. However, if both categories of unaware and uncertain respondents were combined the percentage (54.0%) were higher than the known category. Therefore, this study has significant towards to enhance the level of awareness toward halal vinegar.

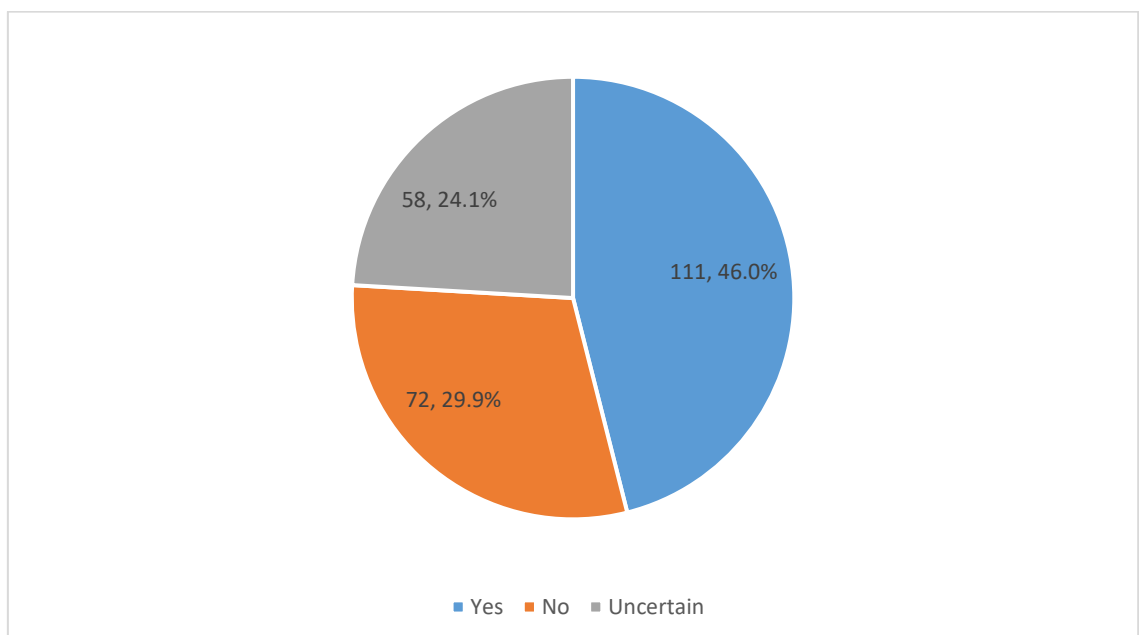


Figure 7: Level of knowledge of the respondents towards the existence of halal vinegar in the Selangor market.

Foods that have halal attributes in terms of labels, packaging, processing and logos are major contributors to decision making and even Muslim consumers are more confident in halal-based foods than non-halal foods (Mohayidin and Kamarulzaman, 2014). In this regard, the majority of respondents were very careful in choosing a halal product especially in vinegar product where 90.9% of the respondents only chose halal Muslim vinegar product. However, there are those who prefer non-Muslim vinegar products with a halal logo. The selection of halal vinegar products can be seen in Figure 8.

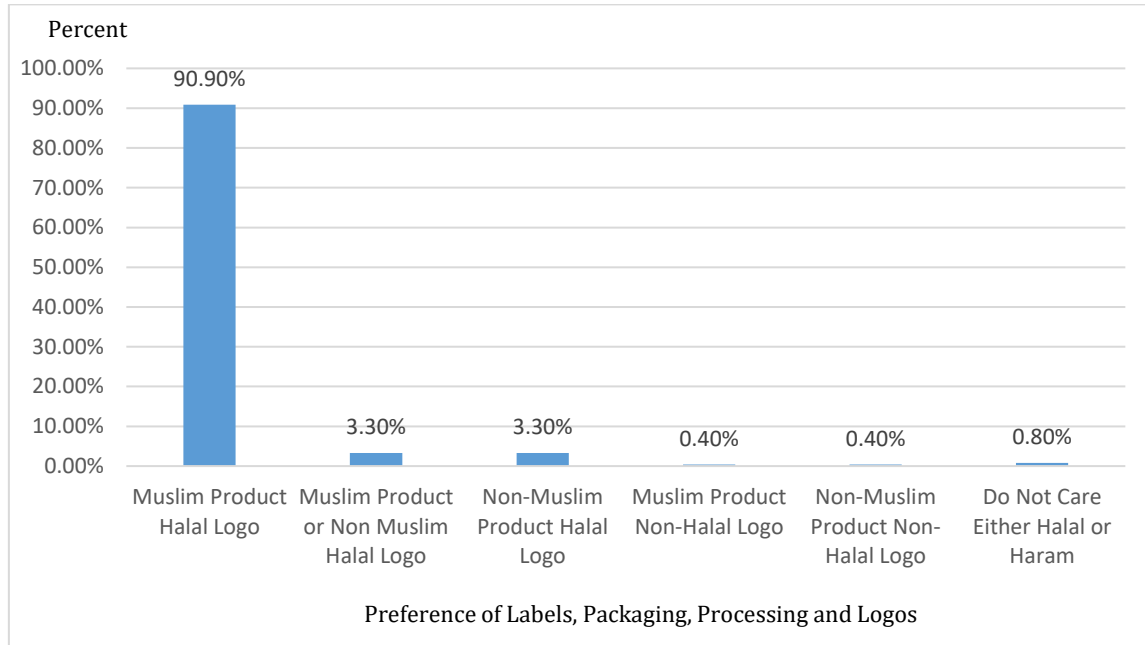


Figure 8: Respondents' preference in terms of labels, packaging, processing and logos.

In terms of respondents' knowledge of vinegar products produced through the fermentation process containing alcohols, the level of knowledge is low. This is because only 36.1% knew about it while the rest were either unknown (32.4%) or uncertain (31.7%). This can be seen in Figure 9.

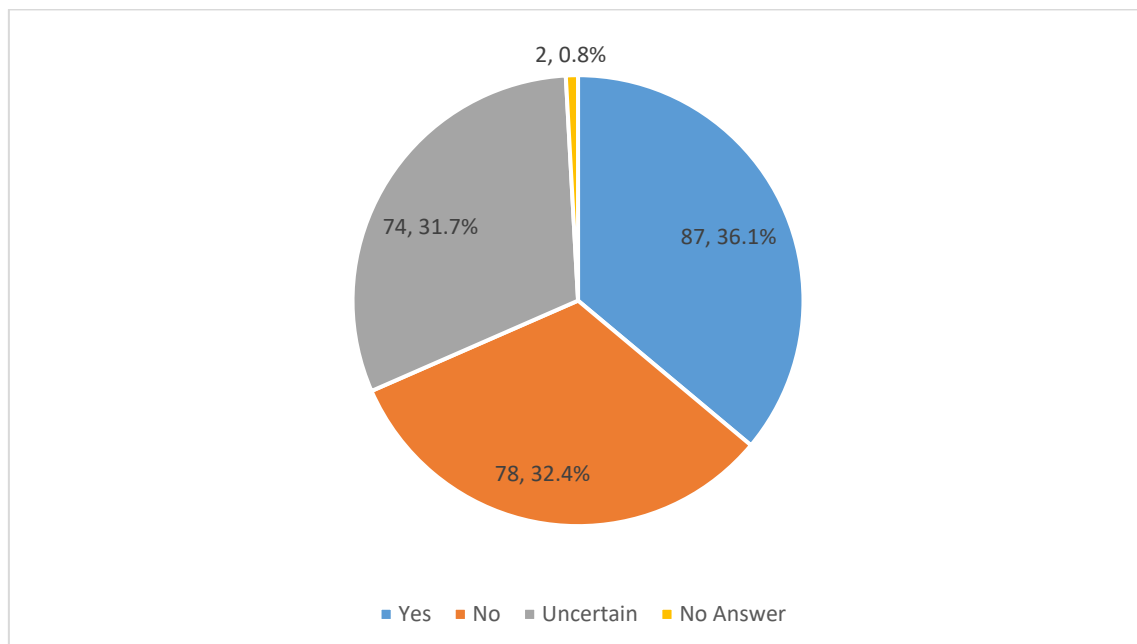


Figure 9: Level of awareness of the respondents' knowledge of vinegar products produced through the fermentation process containing alcohols

Relationship Between Knowledge of Fermented and Alcohol-produced Products

Figure 10 shows that low levels of knowledge of the alcohol content in products produced through the fermentation process result in low levels of respondents' knowledge about the alcohol content contained in each vinegar product. The study found that respondents' knowledge level in this regard was low as only 34.4% of respondents knew about it while 32.5% did not know and 33.2% are uncertain while 1 % did not answer.

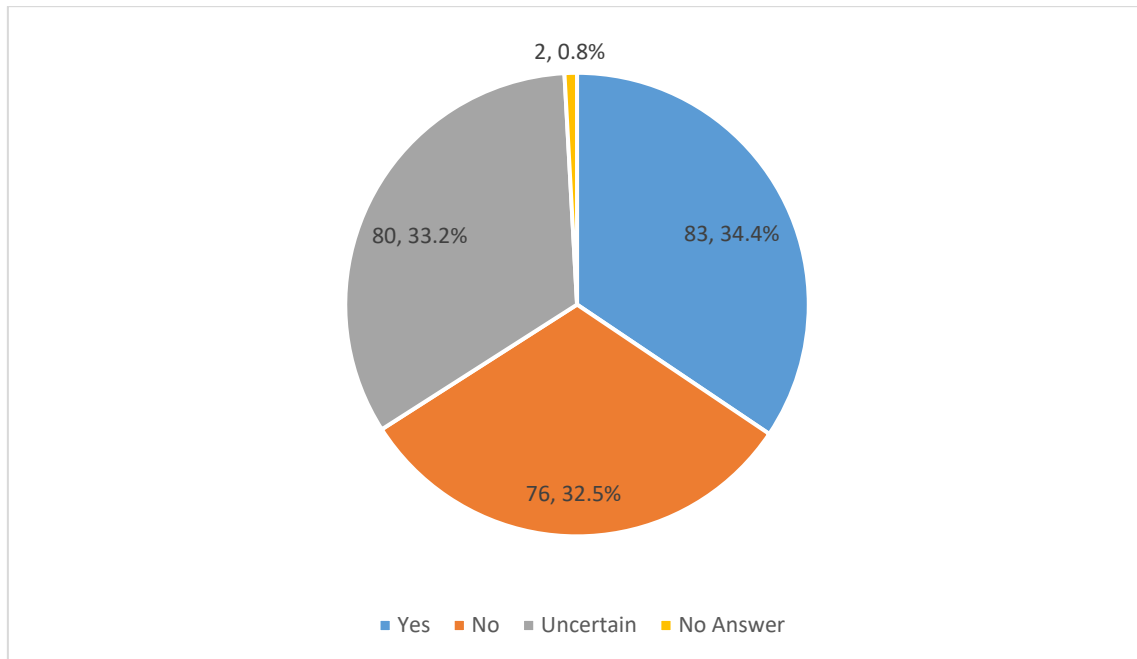


Figure 10: Relationship between knowledge of fermented and alcohol-produced products.

Interviewees were found to be less knowledgeable about the limits of alcohol content allowed in beverages and additional flavouring products. This is because only 27.4% of respondents knew that 1% i/i of the alcohol content limit was allowed in drinks and 0.5% i/i of the alcohol content was the limit of alcohol content allowed for additional flavoring in food and beverages. The rest are either unknown (36.1%) or uncertain (35.3%). The relationship between knowledge of fermented products and awareness of alcohol and food restriction can be found in the following Figure 11.

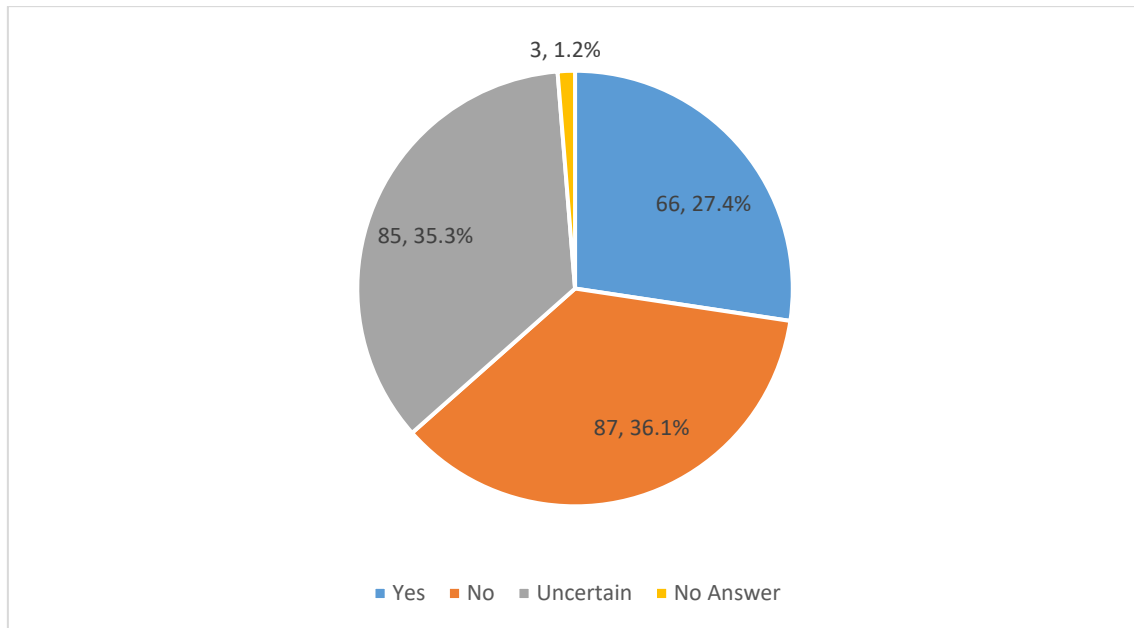


Figure 11: Awareness of the limit of alcohol in beverages and additional flavouring.

However, the majority of respondents were aware that the percentage of alcohol contained in the product they produce will affect the halal status of the product. 53.9% of respondents were aware of the influence while 23.7% were unaware and 22.0% were uncertain. Respondents' awareness of alcohol may affect the halal status of a product as shown in the following Figure 12.

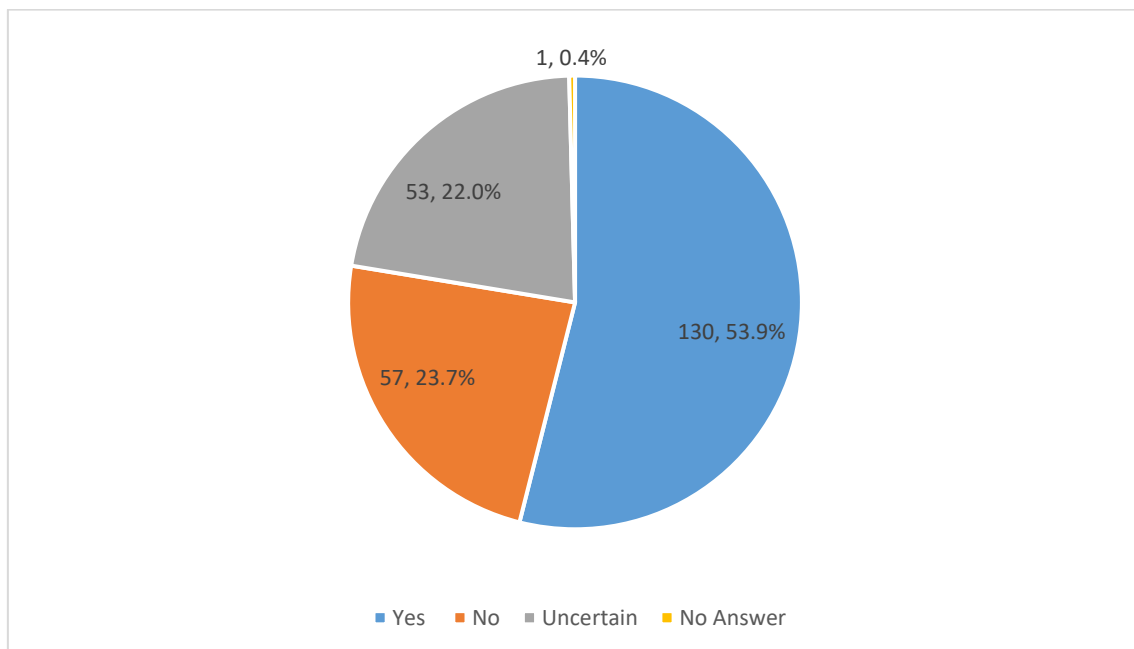


Figure 12: Level of awareness of alcohol percentage would affect halal status of product.

Generally, Muslim consumers are aware and realize that alcohol is an illegal beverage to be used in any form of food and drink and they are aware that a high percentage of alcohol in a product will affect the legal status of the product. A total of 53.9% of respondents were aware of the impact of this status compared to 23.7% who did not and 22.0% were uncertain.

However, the above study found that consumer awareness of products produced through long fermentation processes containing alcohol was found to be low in percentage

and even consumer awareness and knowledge of alcohol content limit allowed in food and beverages was low at 28% while the rest are not aware of it. Therefore, the results of this study can serve as a reference for law enforcement and government agencies that have legitimate authority in determining the halal status of vinegar products and other products produced through fermentation process.

The relationship between the respondents' background and the awareness of the percentage of alcohol contained in the product will affect the halal status of the product. Chi-square test is used to test whether there is a causal relationship between the respondents' background and the awareness that the percentage of alcohol contained in the product is likely to affect the halal status of the product. If the p value obtained is less than 0.05, then it can be concluded that there is a significant relationship, but if the value obtained is ($p \geq 0.05$), then the conclusion is that there is no significant relationship. The result is as shown in Table 2.

Table 2: The relationship between the respondents' background and the awareness towards the percentage of alcohol contained in the vinegar product.

Variable	Chi square	Degrees of Freedom	p-value	Result
District	27.82	24	0.268	Failed to reject H_0
Gender	5.28	6	0.509	Failed to reject H_0
Age	7.17	12	0.846	Failed to reject H_0
Marital status	7.53	6	0.274	Failed to reject H_0
Level of education	21.75	15	0.115	Failed to reject H_0

Note: H_0 is rejected if p-value is less than 0.05

The Table 2 shows that there is no significant relationship between the awareness that the percentage of alcohol contained in the product is influenced by the halal status of the product or any of the respondents' demographic background. This is because all p-values obtained are greater than 0.05. It shows that respondents' demographic background does not affect their awareness that the percentage of alcohol contained in the product is likely to affect the halal status of the product.

CONCLUSION

This study shows that many of the respondents are aware of the existence of variety of vinegar in the Selangor market and they are very careful in choosing a halal vinegar that produced by Muslim. Study on the level of respondent's awareness towards the alcohol content in vinegar as a result of the fermentation process indicated low level of awareness where 36.1% only aware the same goes for the level of awareness of respondents towards the allowable alcohol content in food and beverages was just 27.4% of all respondents.

Nevertheless, the majority of respondents were aware that the percentage of alcohol contained in the product will affect the halal status of the product. Increasing consumer awareness of halal products will improve the quality of food and stimulate the government to monitor safe use of products.

ACKNOWLEDGEMENTS

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