

## Stockpiling in a Pandemic: How COVID-19 Has Changed Consumers' Food Purchasing Behaviour

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### ABSTRACT

COVID-19 pandemic has been a massive disruption to the way of life and has forced people to adapt to new norms and changes in daily activities. The pandemic has also had a significant impact on consumer behaviour, particularly in the way people purchase food. One of the most notable changes observed is the rise in stockpiling behaviour where people are purchasing more food than they would normally need. Based on the literature review, three aspects were recognised as COVID-19 situational factors that could potentially impact consumers' stockpiling behaviour, namely health and safety concerns, perception of current food product supply, and technological adaptation. To understand the impact of COVID-19 on consumers' food stockpiling behaviour, this study was conducted among 400 Malaysian consumers through the distribution of questionnaires. The results found that all three factors had a positive and significant impact on consumer stockpiling behaviour. In particular, people became increasingly concerned about the pandemic and the potential for food shortages, and as they became more technologically savvy, they were more likely to purchase food products and stockpile them. This study provides valuable insights into how COVID-19 has affected consumer behaviour in relation to stockpiling food. It is a starting point for understanding how consumer behaviour has been impacted by the pandemic and how it can help shape future strategies for managing food supply and distribution. The findings of the study could be used to inform food supply chain management strategies, particularly in terms of consumer behaviour and demand for food products during the pandemic. Future research could aim to replicate the study in different locations and with larger sample sizes to further understand the impact of COVID-19 on consumer behaviour.

**Keywords:** COVID-19 Pandemic, Situational Factors, Purchase Behaviour, Food Stockpiling Behaviour

## 1.0 INTRODUCTION

On March 11, 2020, a global health emergency was declared in response to the COVID-19 pandemic, and world governments were urged to take action to prevent the spread of the virus (World Health Organization, 2020). These steps were deemed necessary because the COVID-19 pandemic has arisen as a severe public health danger and wreaked havoc on societies worldwide, causing countries to adopt temporary shutdowns to halt the virus's spread (Centers for Disease Control and Prevention, 2020; Sheth, 2020; Ullah & Ferdous, 2022). Responding to the COVID-19 pandemic, the Malaysian government established the Movement Control Order (MCO), which imposed travel restrictions and movement controls to stem the virus's spread. The goal is to stop and regulate COVID-19 spread within the community so that serious damage is limited, particularly the number of deaths and fatalities. However, due to the dynamic transmission of COVID-19, it is challenging to implement the MCO, also known as lockdown. Although the lockdown enforcement is intended to protect public health and safety in the first place, the implementation has caused several downsides and turbulences in the economy, such as labour shortages and logistical difficulties that eventually lead to a shortage of supplies of retail products. This is evident when the lockdown constraints impact the supply chain not just among manufacturers, distributors, and retailers but also among consumers due to labour shortages and logistical disruptions, notably in the supply networks (Alaimo et al., 2020; Butt, 2021; Schleper et al., 2021). In other words, production has been curtailed, paused, or temporarily halted due to the restrictions. All the economic disruptions mentioned somehow contributed to the uncertain and unstable product supplies that elevated people's panic buying and stockpiling behaviour, which eventually caused a sudden rise in the demand-side for food supplies (Chakraborty, 2023; Hobbs, 2020). It could be said that consumers' purchasing behaviour has changed due to the COVID-19-induced economic uncertainty, where their panic buying or stockpiling tendencies have been critically apparent, creating an unusual blow in the demand side of the products (Chua & Banerjee, 2020; Gao et al., 2020; Kim & Lee, 2020; Shah & Mattoo, 2020). This is evident when the supermarket shelves are lacking not only non-food products and general merchandise, but what is more concerning is insufficient essential food items. It is believed that many consumers engaged in stockpiling behaviours to prepare for MCO restrictions because they feared disruptions to food distribution systems when governments imposed several restrictions during the time of Covid- 19.

Chua and Banerjee (2020), Kim and Lee (2020), and Parry (2020) espoused that consumers' food stockpiling behaviour is believed to be attributable when they are concerned about their health and safety. This is because some people are even too scared and take the highest caution when going to a public area to prevent COVID-19 virus infection, so they will try to avoid going out from home unless necessary. People will reduce their frequency of visiting shops to buy things, so they tend to purchase in large quantities within one visit. As Ellison et al. (2021), Grashuis et al. (2020), and Wang et al. (2021) noted, the number of visits to the grocery shop and the amount of money spent on food has changed drastically among consumers during COVID-19. In terms of food product supply, Chai et al. (2020), Lim and Karim (2020) and Mohd et al. (2021) claimed that the closure of several production plants and factories due to the MCO restrictions has led to operational disruptions for these businesses. These temporary closures have also led to a shift in consumers' perception of the current food product supply situation, creating a significant impact on food stockpiling behaviour. This shift in perception is believed to happen when people are scared and worried that they did not have enough food during the pandemic, so they will stockpile in advance. Besides health and safety concerns and perception of the current food product supply, technological adaptation is also considered to play a role in changing consumers' stockpiling behaviour during the pandemic. This is because it has enabled consumers to purchase and store products easily, such as food, online. With the widespread use of e-commerce platforms, consumers can purchase food items from the comfort of their own homes without the need to physically visit a store (Zhang & Wang, 2021; Zhang & Li, 2021). This convenience may lead to increased food stockpiling behaviour, as consumers feel less urgency to make trips to the grocery store. In addition, the use of technology could mitigate the effects of supply chain disruptions, which could also be a contributing factor to increased stockpiling (Chiu, 2020; Li & Fan, 2020; Zhu & Fang, 2020).

From the highlighted matters, it could be said that the COVID-19 situational factors have disrupted global food systems through the escalated consumers' food stockpiling behaviour, leading to food insecurity concerns worldwide. For instance, consumers may stockpile food because they are concerned about their

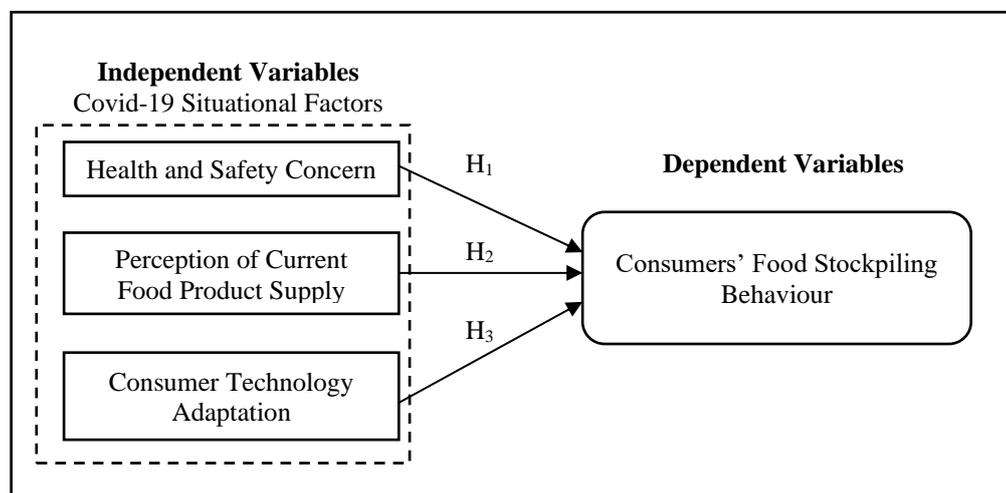
health and safety from getting infected by the virus, leading to food shortages for others who may not have the financial means to buy them. Not only that, but the perception also that there is a shortage of food products due to the pandemic may lead to panic buying, hoarding, and increased food prices. Conversely, the perception that there is an abundant supply of food products may lead to decreased demand and potential food waste due to oversupply. Furthermore, with the rise of e-commerce and online grocery shopping, consumers may be more likely to stockpile food products when ordering online than when shopping in-store due to the convenience of ordering from home. This shift towards online grocery shopping may also lead to food insecurity concerns for those who lack access to technology or who are not accustomed to online shopping.

Having said that, however, little attention has been paid to the factors that underlie changes in consumer food stockpiling behaviour during the pandemic, particularly regarding COVID-19 situational factors in the Malaysian setting. In other words, could the consumer’s health and safety concerns, perception of the current food product supply, and technological adaptation influence the consumer food stockpiling behaviour? All these suppositions are, in fact, unknown, whereby a further investigation is considered to benefit several parties or stakeholders from both academic and practical perspectives. Understanding the extent to which these factors influence consumer food stockpiling behaviour is essential for policymakers, food producers, and retailers to ensure food security and prevent panic buying during emergencies. Thus, this has brought up a decision implying that an empirical investigation warrants to be undertaken.

### 1.1 Underpinning Theory and Study Framework

The most suited underpinning theory for this study would be the Theory of Planned Behaviour (TPB). The TPB is a widely used theoretical framework in the field of social psychology to explain and predict human behaviour. It states that behavioural intention is influenced by three factors: attitude, subjective norm, and perceived behavioural control. Therefore, the TPB can provide a comprehensive framework for understanding and predicting consumers’ food stockpiling behaviour based on their health and safety concerns, perception of current food product supply, and consumer technology adaptation.

Based on that notion, the framework for this study is developed with the TPB as the foundation, and it is illustrated as follows:



**Figure 1: Study Framework**

In the given variables’ context, the attitude was linked to health and safety concerns, potentially affecting consumers’ food stockpiling behaviour. The subjective norm, which pertains to social pressure to perform or not perform a certain behaviour, was related to the perception of the current food product supply, which could also impact consumers’ food stockpiling behaviour. Finally, perceived behavioural control, which reflects the perceived ease or difficulty of performing the behaviour, was associated with consumer technology adaptation, potentially influencing the likelihood of consumers’ food stockpiling behaviour.

## 1.2 Research Objectives

The study's main purpose is to determine the impact of COVID-19 situational factors on consumers' food stockpiling behaviour. In achieving this purpose, three objectives were posed to provide a better direction for the study:

- RO1** : To determine the influence of health and safety concerns on consumers' food stockpiling behaviour
- RO2** : To investigate the influence of perception on current food product supply on consumers' food stockpiling behaviour
- RO3** : To examine the influence of consumer technology adaptation on consumers' food stockpiling behaviour

## 1.3 Research Hypothesis

From the research objectives, four directional hypotheses were formulated:

- H1** : Health and safety concern positively influence consumers' food stockpiling behaviour
- H2** : Perception of current food product supply positively influences consumers' food stockpiling behaviour
- H3** : Consumer technology adaptation positively influences consumers' food stockpiling behaviour

## 2.0 LITERATURE REVIEW

The subsequent sections of the literature review discuss the variables of interest, particularly on the COVID-19 situations around the world, health and safety concerns, current market supply and demand, technology adaptation and consumers' food stockpiling behaviour.

### 2.1 COVID-19 Situations Around the World

The deadly COVID-19 pandemic has had far-reaching consequences, affecting not just global economic volatility but also consumer purchasing decisions (Addo et al., 2020; Valaskova et al., 2021; Zhu & Fang, 2020). Many governments responded to the pandemic's global spread by closing all shopping malls and other stores, some of which were vital to citizens' everyday life. To combat the spread of COVID-19, the government implemented strict social distancing policies and restricted access to enclosed rooms and regions where the virus could spread. Government policies, the fear of the unknown and uncertainties associated with the pandemic and the resulting market conditions, supply chain disruptions, and the panic of a crisis all had an impact on consumer purchasing behaviour (Djordjevic et al., 2020; Javalgi & White, 2021; Kotler & Kartajaya, 2020; Qin & Wang, 2021). In early 2020, customers' behaviour shifted dramatically due to growing fears of infection and social distancing mandates (Gao et al., 2020). The pandemic situation has caused numerous changes in everyday life. People are primarily influenced by social isolation and quarantine, which is why they are attempting to adapt their daily habits to the current pandemic.

### 2.2 Health and Safety Concerns

COVID-19 has led to a worrying impact and scares people worldwide because of its mortality, forcing the government or authorities to implement precautionary measures. As a result, public movement is restricted as one of the measures taken by the government to control in the form of lockdown and social distancing norms. Consequently, the public in the consumer context is likely to be affected due to the new norms, and their behaviour will change since they are concerned about their own and their family's health and safety. This behaviour change is evident when consumers are afraid and hesitant to go out in public areas many times and only go out of the house when necessary to buy things since they are concerned about their health and safety (Chua & Banerjee, 2020; Kim & Lee, 2020; Parry, 2020; Stewart, 2021). Siche (2020) denoted that consumers are reluctant to go to grocery stores, markets, or supermarkets frequently due to the fear of getting COVID-19 that might infect them and their loved ones.

In terms of dining out, consumers will avoid eating out and choose to prepare their meals at home. Because of this, consumers are inclined to stock up on food at home because they are concerned about their health and safety and thus do not want to leave their homes unnecessarily. Consequently, people will cook and prepare their meals at home every day, and due to this, they prefer products with a longer shelf life, such as dried, canned, or frozen foods (Bredahl & Hartmann, 2019; Chai & Chua, 2018; Quirós et al., 2017). Consumers will want to purchase greater quantities of food stock, making it easier to prepare food and, at the same time, avoid or reduce the frequency of going out to buy grocery items.

To prevent the COVID-19 spread and infection, the Malaysian government has announced that each family is only permitted one person to go out and buy necessities such as food. The government also discourages shoppers from bringing unnecessary family members to the store, particularly those susceptible to the COVID-19 infection. Shoppers must maintain physical and social distance due to the pandemic's heightened contagiousness and government-imposed limitations, and they are unable to buy as they did before the pandemic (Hidayat & Wulan, 2020; Kelly & Lally, 2021; Kim et al., 2021; Mansoor & Jalal, 2011). These fears and risks to their health and safety are also believed to lead to the rise of consumer panic buying, thus encouraging them to stockpile foods.

### **2.3 Perception of Current Food Product Supply**

Among the outcomes of the COVID-19 pandemic restrictions was the closure of shops and other businesses for months. News that the government will close some sectors of the economy and limit the operating hours of shops and supermarkets went viral not only on mainstream but also on social media. Consumers somehow presume that since many of the economic sectors are being temporarily shut down, most of the production plants and factories are distorted in terms of their operation, thus affecting the current product supply in the market. Because of the fear of commodities running out of supply during these uncertain times, consumers are prone to the behaviour of panic buying and stockpiling to safeguard themselves from insufficient or out-of-stock situations (Choi & Koo, 2021; Heravi & Martin, 2020; Ogden & Xing, 2020). As a result, consumers are believed to change their purchasing behaviours and habits eventually.

According to Baker et al. (2020), the consumer will stockpile needed household supplies such as food since it is undoubtedly an essential and basic human necessity. Panic buying is a common human response to a crisis driven by fear or perception of simply running out of food, which will make them hungry and not have enough energy to live their lives, or even sometimes make them sick. During a crisis, consumers' panic buying usually originates from their perception of out-of-stock items, empty racks, speculation, and misinformation, which encourage them to stockpile supplies. In order to survive in this COVID-19 crisis and uncertain time, consumers' food purchasing behaviour is believed to alter as well, as a result of their perception of insufficient food product supply.

### **2.4 Consumer's Technology Adaptation**

Ever since the COVID-19 pandemic, consumers have changed their daily activities and purchasing habits, forcing companies to adapt and reassess their strategies to reach them (Liu & Miao, 2021; Song et al., 2021). Consumers are gradually adopting various technological gadgets and applications in their purchasing trends since they are now buying things online compared to physical store visits before the COVID-19 incidents. The shift in purchasing behaviour is catalysed since the consumers have grown accustomed to staying at home, forcing them to find alternatives to purchase or use services on the internet. In return, online shopping has grown substantially, with consumers exercising caution while isolating themselves at home to stop the chain of COVID-19 infection. Consumers have become very cautious about physical visits to stores or restaurants, preferring to obtain food supplies online (Moorthy et al., 2020).

One area of food distribution that is changed significantly during the COVID-19 pandemic is the growth of online grocery and food deliveries. Click-and-collect services have become increasingly popular, where customers place online food orders for home delivery options, particularly in major cities (Lai, 2021; Lin et al., 2021; Zheng & Wang, 2021). Online food and grocery deliveries are handy for vulnerable people (the elderly or those with underlying health difficulties) and to aid with social isolation as governments issue "remain at home" orders to residents. Many businesses sell their products through social media

applications such as WhatsApp and Facebook groups, including ready-to-eat food and raw or dry ingredients. As more people comply with stay-at-home, social distance, and isolation orders, the conventional food retailing sectors have a chance to meet critical community needs while establishing a reputation with consumers by selling their products online and providing home deliveries.

Based on the above contentions, it could be said that consumers do not need to worry if they must stay at home and out of food supplies because, nowadays, the advancement of technology will facilitate and ease the process of getting or purchasing them. In other words, it is believed that with the consumers' ability to use technology to purchase online, it will further encourage them to stockpile food.

## **2.5 Consumers' Food Stockpiling Behaviour**

During a crisis such as COVID-19, irrational stockpiling behaviour is commonly linked to basic psychological requirements that drive it (Dhar, 2020; Moussa, 2020; Wang, 2020). The stockpiling behaviour could be seen as a group activity rather than an individual one because people do not feel their outrageous behaviours are wrong or alienated when they see others doing the same thing, thus sharing the blame with others (Bromley & Rindova, 2010; Riotto, 2017; Wu & Lin, 2020). In addition, it gives people the impression that they are smarter and more secure than others, by their thoughts that they are advanced in action by preparing stocks at home. However, this stockpiling behaviour undoubtedly worsens the COVID-19 pandemic situation and has 'domino effects' on the economy, society, and local communities.

In terms of the economy, the stockpiling behaviour will create an unfavourable competitive purchasing environment, reducing equitable access to critical commodities and increasing prices (Feng et al., 2020; Liu et al., 2021; Wang & Lu, 2022). Consequently, as retail stocks run out, the lower-cost essentials will sell out rapidly, forcing latecomers to settle for higher-cost alternatives. Meanwhile, from the view of society and local communities, the elderly, disabled people, and those who are not fit enough to go shopping compared to an average healthy person will be seriously impacted. This is because these vulnerable groups will encounter several difficulties in going and shopping from one store to another to find their essential supplies, spend more time shopping, visit more stores, and drive long distances to meet their basic needs.

## **3.0 METHODOLOGY**

This methodology section discusses the related research design, population and sample, and instrumentation utilised in this study.

### **3.1 Research Design**

This study employs a quantitative approach to investigate the impact of COVID-19 situational factors on consumer purchase behaviour in Malaysia. The quantitative method involves collecting and analysing numerical data to understand patterns, make predictions, and establish causal linkages (Mohajan, 2020; Nardi, 2018). The advantages of this research approach include the ability to discover patterns and averages, create predictions, evaluate causal linkages, and simplify the information produced (Creswell & Creswell, 2018; Johnson & Onwuegbuzie, 2004; Yin, 2014). This study is classified as causal research, which aims to determine the cause-and-effect relationship between two or more variables. The time horizon of this study is cross-sectional, meaning that data is collected at a specific point in time. Additionally, the study is conducted in a contrived setting, where the researcher constructs a specific scenario to investigate, allowing for more efficient and timely data collection. The unit of analysis in this study is individual Malaysian consumers, particularly those directly involved in making food purchase decisions for their households.

### **3.2 Population and Sample**

Since this study aimed to examine the impact of COVID-19 situational factors on consumers' food stockpiling behaviour, the population includes those who were directly involved in making food purchase decisions for their households. The sampling technique used in this study is judgmental sampling, where a sample of 400 individual Malaysian household food consumers was successfully gathered. According to Blanche et al. (2015), Kirk (2013), Tabachnick and Fidell (2019), and Trochim and Donnelly (2008), a sample size of at least 300 cases or more is considered sufficient to achieve good reliability and validity

measures. Additionally, judgmental sampling ensures that the sample is representative of the population of interest in terms of demographics and behaviours.

### 3.3 Instrumentation

This study used a questionnaire to gather data to examine the impact of COVID-19 on consumers' food stockpiling behaviour. The survey was developed in both English and Malay to minimise misunderstandings or misinterpretations. Closed-ended questions with a 5-point summarised rating scale were used to measure people's attitudes and opinions about different aspects pertaining to the tested variables. The survey was divided into five sections: health and safety concerns, consumer technology adaptation, perception of current food product supply, consumers' food stockpiling behaviour, and demographic questions. The instrument created for this study were mainly derived and adapted from prior work by Mansoor and Jalal (2011), Baker et al. (2020), Alaimo et al. (2020), and Valaskova et al. (2015).

### 3.4 Validity of Instrumentation

Two academic professionals in the respective field assessed the questionnaire to ensure content validity before it was finalised. The questionnaire was given to them, and they were asked to read it and reply by identifying the importance of the questionnaire dimensions and categories (functional domains and competency assertions), particularly in terms of specificity and coverage, as suggested by Creswell and Creswell (2018).

### 3.5 Data Analysis

The collected data were analysed using IBM SPSS Statistic Version 27 software employing two analyses: descriptive and simple linear regression. Descriptive analysis was used to analyse data from all sections of the questionnaires, measuring consumer demographic data, mean and standard deviation. For the research questions and hypotheses, simple linear regression was utilised to determine if each independent factor affected the dependent variable. This method allowed the researcher to analyse the statistical data and discover the causal effect between the independent variables and the dependent variable. Additionally, the method was used to examine the strength of the relationship between the variables and test the hypotheses, making the study's results more impactful.

## 4.0 RESULT AND DISCUSSION

To address the research objectives and questions, the procedures of analysis were further discussed. The reliability coefficient is presented to determine how consistently the ratings are given on each dimension used in this study, followed by respondents' profiles. Descriptive statistics are then displayed to further describe the properties of each item's minimum, maximum, mean, and standard deviation. Finally, using simple linear regression analyses, the effect between variables (independent and dependent variables) was reported in response to the study's objectives and hypotheses.

### 4.1 Result

The reliability of the tool used in the study is important to show the quality of the measurement method, which is the internal consistency of the scale used (Pallant, 2005). For quantitative measurement of internal consistency, Cronbach's Alpha Coefficient is the most frequently used indicator.

**Table 1: Reliability Coefficient for Each Section of the Questionnaire**

| Questionnaire                             | No. of items | Cronbach's Alpha |
|---|--------------|------------------|
| Health and Safety Concerns                | 5            | .865             |
| Perception of Current Food Product Supply | 5            | .901             |
| Consumer Technology Adaptation            | 6            | .918             |
| Consumers' Food Stockpiling Behaviour     | 5            | .856             |

Referring to the table, the coefficient alpha for the dimension of consumer technology adaptation produced the highest coefficient value of .918, followed by the perception of current food product supply with a coefficient value of .901, and with the lowest coefficient value of .865 is health and safety concern. For

consumers' food stockpiling behaviour, the coefficient value is slightly lower than the previous dimension, which is .856. According to Ryan (1995), any testing should be judged reasonable and acceptable if the coefficient value is greater than 60.

Regarding gender, there was a slightly high proportion of female consumers, 63% (n = 252), compared to male consumers at 37% (n = 148). From this finding, the number of female respondents is higher than males. The second frequency test looks at respondents' age, 6% (n = 22) in the range of under 20 years old, 39% (n = 157) in the range of 21 – 25 years old, followed by 10% (n = 40) respondents aged between 26 – 30 years old, while the remaining 45% (n = 181) were 30 years old and above. Almost 52.5% (n = 210) of respondents had a monthly income of below RM2000 and below. This is followed by 27% (n = 108) of total respondents with income RM 2100-3000 and 5% (n = 20) of total respondents with income RM 3100-4000. The rest 15% (n = 62) from RM 4100 and above. There was a slightly high proportion of married-status consumers, 55% (n = 219), compared to single consumers with 45.3% (n = 181) participating in this study

**Table 2: Overall Mean Score of Impact COVID-19 Situational Factors**

|   | N   | Minimum | Maximum | Mean | Std. Deviation |
|---|-----|---------|---------|------|----------------|
| Health Safety Concerns                  | 400 | 2.20    | 5.00    | 4.65 | .531           |
| Perception Current Food Products Supply | 400 | 1.40    | 5.00    | 4.26 | .716           |
| Consumer Technology Adaptation          | 400 | 1.33    | 5.00    | 4.22 | .711           |
| Consumers' Food Stockpiling Behaviour   | 400 | 1.80    | 5.00    | 4.14 | .613           |

Table 2 depicts the descriptive statistics mean score for the health and safety concerns, perception of current food product supply, consumer's technology adaptation, and food stockpiling behaviour. According to each question's unique design, the questions were ranked from highest to lowest based on their mean scores.

#### 4.1.1 The Influence of Health and Safety Concerns on Food Stockpiling Behaviour

The predictor variable (Health and Safety Concerns) and the criterion variable (Food Stockpiling Behaviour) were entered into a linear regression equation. The output of the analysis is summarised in Table 3.

**Table 3: Result of Simple Linear Regression of Health and Safety Concerns on Food Stockpiling Behaviour**

|                            | B     | SE B | $\beta$ |
|----------------------------|-------|------|---------|
| Constant                   | 1.089 | .223 |         |
| Health and Safety Concerns | .657  | .048 | .569*** |

Note:  $R^2 = .324$ , \*\*\* $p < .001$ .

#### 4.1.2 The Influence of Perception on Current Food Product Supply on Food Stockpiling Behaviour

The predictor variable (Current Food Product Supply) and the criterion variable (Food Stockpiling Behaviour) were entered into a linear regression equation. The output of the analysis is summarised in Table 4.

**Table 4: Result of Simple Linear Regression of Perception of Current Food Product Supply on Food Stockpiling Behaviour**

|                             | B    | SE B | $\beta$ |
|-----------------------------|------|------|---------|
| Constant                    | 1.51 | .129 |         |
| Current Food Product Supply | .617 | .030 | .721*** |

Note:  $R^2 = .519$ , \*\*\* $p < .001$ .

#### 4.1.3 The Influence of Consumer Technology Adaptation on Food Stockpiling Behaviour

The predictor variable (Consumer Technology Adaptation) and the criterion variable (Food Stockpiling Behaviour) were entered into a linear regression equation. The output of the analysis is summarised in Table 5.

**Table 5: Result of Simple Linear Regression of Consumer Technology Adaptation on Food Stockpiling Behaviour**

|                                | B     | SE B | $\beta$ |
|--------------------------------|-------|------|---------|
| Constant                       | 1.691 | .136 |         |
| Consumer Technology Adaptation | .582  | .032 | .675*** |

Note:  $R^2 = .456$ , \*\*\* $p < .001$ .

The hypothesised relationship between health and safety concerns towards food stockpiling behaviour (Hypothesis 1) was significant, with a standardised coefficient of .569 ( $p < .001$ ). The standardised coefficient from the perception of current food product supply towards food stockpiling behaviour (Hypothesis 2) was .721 ( $p < .001$ ), indicating that this variable is a significant predictor of the dependent variable. Hypothesis 3 was also supported by a significant estimate of .675 ( $p < .001$ ), directly linking consumer technology adaptation and food stockpiling behaviour. In addition, 32.4% of the variation in food stockpiling behaviour was explained by health and safety concerns, 51.9% by the perception of the current food supply, and finally, 45.6% of the variation was explained by consumer technology adaptation.

## 4.2 Discussion

Simple linear regression analyses for the relative importance of health and safety concerns, perception of current food product supply, and consumer technology adaptation were found to be significant contributors to consumers' food stockpiling behaviour. In detail, this study verified that health and safety concerns have positively influenced consumers' food stockpiling behaviour. This could be explained because some people are too scared and take the highest caution when going to public areas, so they will try to avoid going out from home unless necessary. Besides, the consumer will reduce their frequency of visiting shops to buy things, so they will tend to purchase in large quantities within one visit. According to Chua and Banerjee (2020), Kim and Lee (2020), Parry (2020), and Stewart (2021), consumers have become increasingly concerned about their health and safety due to the outbreak of the COVID-19 pandemic. As a result, they have altered their shopping habits and behaviours to reduce their exposure to potential dangers. This behaviour has led to an increase in food stockpiling as consumers try to reduce the number of trips that they take to the grocery store to minimise their exposure to the virus.

In addition, the study found that the perception of the current food product supply is also a significant contributor to consumers' food stockpiling behaviour. The results of this study align with previous research on consumer behaviour during times of crisis and uncertainty. For example, a study by Lin and Chen (2020) found that consumer stockpiling behaviour was significantly influenced by fear of food shortages due to supply chain disruptions during the COVID-19 pandemic. The authors noted that various factors, including concerns about personal safety, uncertainty about the future, and limited access to goods and services, influence consumer behaviour during a crisis. Similarly, another study by Kim and Lee (2021) found that the perception of food security was a significant predictor of consumer stockpiling behaviour during the COVID-19 pandemic. The authors found that consumers who perceived a higher risk of food insecurity were more likely to engage in stockpiling behaviour. This is likely because such consumers sought to protect themselves from potential food shortages by purchasing and storing food items in advance.

Finally, this study provides valuable insights into the role of technology adaptation in driving food stockpiling behaviour during the COVID-19 pandemic. As Lai (2021), Lin et al. (2021), Sergueeva et al. (2020), and Zheng and Wang (2021) noted, technology has a significant impact on consumer behaviour, especially during the COVID-19 pandemic. When consumers feel comfortable and confident with technology, they are more likely to embrace it to fulfil their needs and desires, including purchasing food products. As the study indicates, more technologically savvy consumers tend to stockpile more food items. It is worth noting that technology can provide consumers with a sense of security during uncertain times. With the outbreak of the COVID-19 pandemic, people are becoming more cautious about going out and interacting with others. As a result, they are turning to technology as a means of reducing the risks associated with these activities. In this context, technology adaptation provides consumers with an accessible and convenient way to purchase food and groceries without leaving the safety of their homes.

## 5.0 CONCLUSION

In more ways than one, this study can help other researchers to gain a better knowledge of the evolution of consumer behaviour once the impact of COVID-19 situational factors on consumers' food stockpiling behaviour has been identified and investigated. In the context of this research, three attributes: health and safety concerns, perception of current food product supply, and consumer technology adaptation, are the main features that have been proven to contribute to customer food stockpiling behaviour.

### 5.1 Implication of the Study

Generally, this study is believed to contribute to consumers' stockpiling behaviour's theoretical and practical significance, particularly with the COVID-19 situational factors as the proposed antecedent.

#### 5.1.1 Academic Perspective

From the academic perspective, this study of COVID-19 impacts on consumers' food stockpiling behaviour and determining the situation factor could benefit in more ways than one. First, the results of the study provide a deeper understanding of the factors that contribute to consumers' food stockpiling behaviour during a pandemic. This information can be used to inform and guide marketing strategies for food companies and retailers, who can tailor their offerings to meet the evolving needs and concerns of consumers. Additionally, the findings can inform public health and safety policies, as understanding consumer behaviour can help decision-makers mitigate the potential impact of food shortages and price hikes. Second, the results of the study add to the growing body of research on consumer behaviour during a crisis. This study specifically focuses on the impact of COVID-19 on food stockpiling behaviour, which has not been thoroughly explored in previous research, particularly in a Malaysian setting. By adding to the existing literature, this study can provide a foundation for future research on this topic. Finally, the findings of the study can contribute to the academic fields of psychology and sociology, as they provide insight into how individuals react and adapt to a crisis. Understanding the psychological and sociological drivers of behaviour can help researchers better understand the broader implications of pandemics on society.

#### 5.1.2 Practical Perspective

From a practical standpoint, this study first highlights the significant impact that health and safety concerns have on consumers' food stockpiling behaviour. Consumers are more likely to stockpile food items to reduce their frequency of visiting public areas and shopping for food. Businesses should focus on providing customers with a safe and secure shopping experience, ensuring their products are hygienic and contamination-free. Secondly, the study underscores the impact of the pandemic on the perception of food product supply and the importance of addressing consumer fears about potential shortages. Companies and retailers should take steps to stabilise the food supply chain and reassure consumers that food products will be available in the future. They could also consider offering home delivery services or alternative purchasing options to ensure consumers have access to food, even if they are avoiding public spaces. Lastly, the study highlights the importance of technology in shaping consumer behaviour during a pandemic. Companies and retailers must adopt technology and digital platforms to reach consumers who are reluctant to leave their homes. By making it easy and convenient for consumers to purchase food products, companies and retailers can minimise the negative impact of the pandemic on their businesses and the food supply chain as a whole. Businesses and policymakers can use these practical implications to address the challenges posed by the COVID-19 pandemic and ensure that consumers have access to safe and reliable food supplies.

### 5.2 Limitations and Suggestions for Future Research

This study aimed to investigate the factors that have influenced consumers' food stockpiling behaviour in the context of the COVID-19 pandemic. However, three limitations were identified in the study. Firstly, the sample size was limited to Malaysian consumers, and thus, the results of the study may not be generalisable to other populations. Therefore, future research could expand the sample size to include a more diverse range of consumers from various cultural and geographic locations.

Secondly, the methodological approach used in the study was quantitative, which has its limitations in terms of understanding the complexities of consumer behaviour. A more in-depth understanding of consumer behaviour could be obtained using a mixed research approach, combining qualitative and quantitative methods. This approach would offer deeper insights into the causal relationships between variables and help better understand the food stockpiling behaviour.

Lastly, the variables used in this study only focused on the impact of COVID-19 situational factors on consumer food stockpiling behaviour. Future research could include other variables related to consumer behaviour, such as demographic characteristics, personal attitudes, and beliefs. This would result in a more comprehensive understanding of consumer behaviour and could provide insights into the factors driving consumer food stockpiling behaviour in a pandemic. It is also suggested to explore the continuity of consumer food stockpiling behaviour and its further effects on the level of food insecurity.

In conclusion, while this study provides valuable insights into consumer food stockpiling behaviour, future research could address the limitations identified in this study to provide a more comprehensive understanding of consumer behaviour.

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