

## CONSUMERS' CONSUMPTION PRACTICES OF READY-TO-EAT FOODS AND FOOD SAFETY KNOWLEDGE

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### ABSTRACT

The purpose of this study was to examine consumers' consumption practices of ready-to-eat foods and their food safety knowledge. Convenience sampling was done by giving questionnaires to 258 ready-to-eat food consumers in Klang Valley, Kuala Lumpur, Malaysia. Based on the results, the biggest motivator for consumers to purchase RTE foods was convenience (47.3%). Most respondents (40.7%) consume RTE foods more than twice a week, and purchased RTE food at restaurants and cafes (36.8%). A majority (54.3%) of the respondents purchased RTE foods for their lunch, and spent RM11-RM20 per person (48.1%). Overall, the respondents had good food safety knowledge. A majority (81%) knew that diarrhea is the common symptom of foodborne disease, and knew about the correct temperature for refrigeration (42.2%). Most of the respondents knew that bacteria will grow quickly at body temperature (36.4%), and that room temperature encourages multiplication of bacteria (66.7%). Respondents knew that raw and cooked food should be separated to prevent transfer of bacteria (60.9%), and that placing raw meat in the plastic bag before putting it into the grocery basket decreases chance of foodborne illness (62%). However, not many respondents (10.1%) knew that the best way to clean a cutting board after using it for raw meat is by washing with bleach and water. This study could help RTE food marketers gain better insights into consumers' attitude and behavior patterns towards RTE food. Knowing the baseline knowledge of consumers in food safety is essential for the development of effective educational health?

*Key terms: ready-to-eat, consumer, consumption practice, food safety*

### INTRODUCTION

Ready-to-eat (RTE) food? According to U.S. Food and Drug Administration (USFDA, 2017) means food that is in a form that is edible without additional preparation to achieve food safety, and can include food that is raw or partially cooked. RTE food is readily available, convenient and affordable, contributing to secular changes in eating attitudes (Heroux et al., 2012). The market of RTE food in Malaysia is increasing and has contributed significantly to the gross domestic product in Malaysia's food industry (Baskaran et al., 2017). Due to the growing economic importance of the prepared consumer foods sector, marketers require a better

understanding of the factors that motivate a consumer's ready meal consumption (Olsen et al., 2010).

There are a variety of social, cultural and economic factors that could influence the development, maintenance and change of dietary patterns (Fotopoulos et al., 2009). Factors like employment status, income level, perceived time pressure, convenience orientation and food related lifestyle may as well influence the purchase motivation of RTE meals (Geeroms et al., 2007). Determining the consumer preferences towards food related behaviours and convenience [some ambiguity?] as a food attribute is as important as the taste, health and price (Candel, 2001). There is still a lack of research carried out in Malaysia to understand consumer behaviours better (Muniady et al., 2014). It is important to understand consumer decision-making for companies and marketers in coming up with appropriate marketing strategies (Bae et al., 2010; Muniady et al., 2014). This study therefore intends to assess consumer consumption practices in Malaysia.

The consumption of food prepared outside the home, however, increases exposure to the risks posed by poor hygiene in food service. Foodborne diseases has remained a global public health challenge (Feltes et al., 2017). As stated by FDA (2017), foodborne diseases cause approximately 48 million illnesses, 128 000 hospitalisations, and 3 000 deaths in U.S. each year. As reported by World Health Organisation (WHO) (2019), every year 220 million children contract diarrheal disease, and 96 000 die. WHO has been actively promoting safe food handling through systematic disease prevention and awareness programmes? The FDA has also established public health interventions to protect consumer health such as demonstration of knowledge, controlling hands as a vehicle of contamination, time and temperature parameters for controlling pathogens, and the consumer advisory (USFDA, 2017).

Consumers have an important role in preventing foodborne disease, and there is an urgent need to improve consumers' food hygiene knowledge and practice (Kennedy et al., 2005). It is necessary to understand the baseline of consumers' food safety knowledge for the development of effective health educational programmes in Malaysia. Many previous studies on food safety knowledge in Malaysia have all focused on specific groups such as youths and local food handlers (Woh et al., 2016), hence, this study will attempt to assess food safety knowledge of the general consumers in Klang Valley, Kuala Lumpur, Malaysia. The overall objectives of this study are to assess consumers' consumption practices of RTE foods, and their food safety knowledge.

## METHODOLOGY

### Study Design

The main research instrument was a well-structured questionnaire. The research was done to evaluate consumers' consumption practices of RTE meals and also to gather information on their food safety knowledge. A convenience sampling was done where questionnaires were distributed randomly to shoppers in shopping malls in Klang Valley, Kuala Lumpur, Malaysia over a three-month period [or a period of three months].

The questionnaire consisted of three parts (Bae et al., 2010; Meysenburg et al., 2014; Carbas et al., 2013). The first part was demographic profile of the respondents where 7 factors were investigated which was gender, age, race, marital status, education, working period and income level. The second part was to evaluate the consumption practices of the ready to eat meals and what factors motivated

consumers to purchase ready to [eat?] meals. The last section consisted of food safety knowledge among consumers.

A trial questionnaire for a pilot test was sent out to 45 people who purchase ready to eat meals. Based on the results obtained from the questionnaires, a few adjustments were made for the demographic part.

The finalized questionnaires were distributed to 320 respondents (after sample size calculation) at shopping malls in Ampang and Kepong area. All the collected questionnaires were evaluated, and 42 questionnaires were dismissed due to unreliable information and 20 questionnaires were not returned.

### **Ethical Consideration**

Ethical approval for this study was obtained from UCSI University Ethics Committee. Both informed and written consents were sought from all participants. The assurance of confidentiality and anonymity was maintained throughout the study.

### **Data Analysis**

Data was tabulated and analyzed using IBM SPSS Statistics 21. Descriptive analysis tests were performed on the data that were collected.

## **FINDINGS**

Table 1 presents the demographic characteristics of the 258 successful respondents. The results of the frequency analysis showed that 61.2% of the respondents were female and 38.8% were male. The respondents varied in age (20-30 years old = 53.5%; 31-40 years old = 30.6%; 41-50 years old = 10.5%; >50 years old = 5.4%). Most of the respondents received their tertiary education with 41.9% being Degree holders while 13.6% being Masters or PHD holders. The rest of the respondents were SPM level (20.2%), Diploma Holder (22.5%) and others (1.9%). A majority of the respondents were Malays (55%), and up to 60.5% of the respondents were single. As for income per year, a majority received income of less than RM10 000 per year, and a majority (43.8%) worked for more than 5 years.

	<b>Variables</b>	<b>N (%)</b>
Gender	Male	100 (38.8)
	Female	158 (61.2)
Age	20-30 years old	138 (53.5)
	31-40 years old	79 (30.6)
	41-50 years old	27 (10.5)
	>50 years old	14 (5.4)
Race	Malay	142 (55)
	Chinese	61 (23.6)
	Indian	42 (16.3)

	Others (Punjabi)	13 (5.0)
Marital Status	Single	156 (60.5)
	Married	96 (37.2)
	Others	6 (2.3)
Highest Level of Education	SPM or equivalent	52 (20.2)
	Diploma Holder or equivalent	58 (22.5)
	Degree Holder or equivalent	108 (41.9)
	Masters or PHD or equivalent	35 (13.6)
	Others	5 (1.9)
Working Period	None	22 (8.5)
	Less than a year	43 (16.7)
	1-5 years	80 (31.0)
	More than 5 years	113 (43.8)
Income per year	<RM 10 000	94 (36.4)
	RM11 000 – RM20 000	61 (23.6)
	RM21 000 – RM30 000	53 (20.5)
	>RM30 000	50 (19.4)
TOTAL		258 (100)

Table 1. Demographic characteristics of the respondents.

Table 2 presents the consumers' consumption practices of RTE foods. It shows that the majority of the respondents purchased the RTE foods more than twice a week (40.7%). The respondents were mainly motivated to purchase RTE foods out of convenience (47.3%), whereas only 13.6% of the respondents purchased RTE foods due to its price. The most common venues to purchase these foods were restaurants and cafes (36.8%), followed by supermarkets or discount marts (26.7%), food courts (23.3%) and convenience stores (13.2%). The average expense per person for a single purchase of an RTE food was between RM11 – RM20 (48.1%). Most of the respondents purchase RTE foods during lunchtime (54.3%). Finally, the findings show that the most common source of purchasing information was direct recommendation from family, friends and others (39.9%).

	Variables	N (%)
How frequently do you consume ready-to-eat food?	Once a month	41 (15.9)
	Once a week	45 (17.4)
	Twice a week	67 (26.0)
	More than above	

		105 (40.7)
Which factor motivates you to purchase ready-to-eat food?	Cheap price	35 (13.6)
	Convenience	122 (47.3)
	Home cooking is difficult	44 (17.1)
	Different types of food to try out	57 (22.1)
Where do you usually purchase your ready-to-eat food?	Supermarkets or discount marts	69 (26.7)
	Convenience stores	34 (13.2)
	Restaurants and cafes	95 (36.8)
	Food courts	60 (23.3)
What is the expenditure of purchasing ready-to-eat food per person?	<RM10	100 (38.8)
	RM11-RM20	124 (48.1)
	RM21-RM30	27 (10.5)
	RM31-RM40	0 (0.0)
	>RM40	7 (2.7)
Which mealtime do you purchase ready-to-eat food?	Breakfast	40 (15.5)
	Lunch	140 (54.3)
	Dinner	48 (18.6)
	Between meals	30 (11.6)
Where do you get sources of purchasing information?	Advertising media	52 (20.2)
	Direct recommendation (family, friend, etc.)	103 (39.9)
	Comparison between purchasing places	70 (27.1)
	Others	33 (12.8)

Table 2. Consumers' consumption practices of RTE food.

Table 3 shows the consumers' food safety knowledge. A majority of the consumers knew that the temperature in the refrigerator should be at 2°C - 8°C (42.2%). Only 36.4% of the respondents knew that bacteria will grow quickly at the body's temperature 37°C, while 33.3% thought that there will be no bacteria growth at 37°C. Most of the respondents also knew that room temperature encourages multiplication of bacteria (66.7%). A majority knew that they should separate raw and



cooked food because bacteria might transfer from raw to cooked food (60.9%). 62% of the respondents knew that placing raw meat in the plastic bag before putting it into the grocery basket can decrease the chance of foodborne illness. Almost everyone (81%) knew that the common symptom of foodborne illness is diarrhea. However, many respondents did not know the proper cleaning practices for cutting boards and only 10.1% of the respondents knew that the cutting board needed to be washed with bleach and water.

	<b>Variables</b>	<b>N (%)</b>
Temperature in the refrigerator should be at or below	10°C	19 (7.4)
	2°C - 8°C*	109 (42.2)
	-18°C	77 (29.8)
	I don't know	53 (20.5)
At one's body temperature (37°C), what will happen to food bacteria?	Die	31 (12.0)
	No growth	86 (33.3)
	Grow quickly*	94 (36.4)
	Grow slowly	47 (18.2)
Which factor encourages multiplication of bacteria?	Refrigeration	29 (11.2)
	Room temperature*	172 (66.7)
	Sterilization and pasteurization	25 (9.7)
	I don't know	32 (12.4)
Why should you separate raw and cooked food?	There will [this will cause spoilage?] spoilage of food	57 (22.1)
		32 (12.4)
	The flavour will be affected	157 (60.9)
	Bacteria will transfer from raw to cooked food*	12 (4.7)
	I don't know	
Placing raw meat in the plastic bag before putting it into the grocery basket	Increases your chance of foodborne illness	47 (18.2)
	Decreases your chance of foodborne illness*	160 (62.0)
		51 (19.8)
	Makes no difference in foodborne illness	
Which one is the common symptom of foodborne illness?	Headache	20 (7.8)
	Diarrhea*	209 (81.0)
	Skin rashes	16 (6.2)

	I don't know	13 (5.0)
What is the best way to clean a cutting board after it is used for raw meat?	Wiping it out with a dish rag	14 (5.4)
	Washing with soap water	154 (59.7)
	Rinsing it well with water	64 (24.8)
	Washing with bleach and water*	26 (10.1)

\*Indicates correct answer

Table 3. Consumers' food safety knowledge.

### DISCUSSION

The purpose of this study was to examine consumers' consumption practices of RTE food and their food safety knowledge. The results of this study could help RTE food marketers gain better insights into consumers' attitude and behavior patterns towards RTE food (Bae et al., 2010).

According to the survey results for consumers' consumption practices of RTE food, the biggest motivator for RTE foods was convenience (47.3%). This is similar to the findings by Bae et al. (2010) from a survey targeting consumers in the Republic of Korea, and from another previous study by Chae et al. (2008) targeting university students. As stated by Brunner et al. (2010), convenience is one of the big trends in food business. Convenience involves more than just saving time, it includes minimizing physical and mental effort associated with planning and preparing meals.

Approximately 40.7% respondents consume RTE foods more than twice a week, and up to 36.8% respondents purchased RTE food at restaurants and cafes. A majority (54.3%) of the respondents purchased RTE foods for their lunch. This shows that most of the respondents purchased RTE foods for full meals. This is also similar to findings by Bae et al. (2010) who reported that consumers purchased RTE foods for full meals. However, the survey forms used in this study did not highlight whether the respondents consumed full meals or meal components, hence further investigation is needed in order to have a general idea on consumers consumption practices of full meals and meal components (Scholliers, 2015).

For the amount of expenditure for purchasing RTE food per person, 48.1% respondents spent RM11-RM20, and only 38.8% respondents spent less than RM10. This shows that the respondents are willing to pay extra for the convenience they seek, even though a majority received income of less than RM10 000 per year. This is also consistent with the finding of the study by Brunner et al. (2010), which stated that convenience shoppers were less price-sensitive.

Approximately 39.9% respondents stated that direct recommendation from family, friends and others were their sources of purchasing information. Only 27.1% respondents stated that comparing prices between purchasing places was their source of purchasing information [some ambiguity?]. Another study by Bae et al. (2010) also stated that the most common source of purchasing information was direct comparison at the place of purchase. Marketers of RTE meals would find these findings valuable since they could link their marketing strategy with consumers' perception and attitudes towards RTE meals.

A majority of the respondents had good knowledge on food safety. This is possibly due to the fact that a majority of the respondents were [had tertiary education?] Degree holders (41.9%) and were somehow exposed to the basic

knowledge. This was also in accordance to the study by Garayoa et al. (2005) which reported that higher educated students had better food safety knowledge. 81% respondents knew that diarrhea is the common symptom of foodborne disease. With respect to knowledge about refrigeration, a majority of 42.2% respondents knew about the correct temperature for refrigeration. This is similar to the finding by Garayoa et al. (2005) which stated that a majority (71.5%) of their students knew the correct temperature values for refrigeration. In the present study, 36.4% of the respondents also knew that bacteria will grow quickly at body temperature 37°C, and up to 66.7% respondents knew that room temperature encourages multiplication of bacteria.

With regards to cross-contamination issues, 60.9% knew that raw and cooked food should be separated to prevent transfer of bacteria. 62% also knew that placing raw meat in the plastic bag before putting it in the grocery basket decreases chance of foodborne illness. This shows that the respondents had adequate food safety knowledge. However, not many respondents knew that the best way to clean a cutting board after using it for raw meat is by washing with bleach and water (10.1%). According to Garayoa et al. (2005), cross-contamination is a well-recognized factor in foodborne illness outbreaks. Factors such as contact between raw products and cooked meals inside the refrigerator, and use of the same tool for different food handling tasks without proper washing are important risk factor for cross-contamination.

Although respondents showed good food safety knowledge, for future studies, it is recommended to investigate the consumers' actual food handling practices. This is to have an insight whether consumers' understanding on food safety corresponds to their food hygiene practices. According to the study by Garayoa et al. (2005), there was a considerable difference between knowledge and behavior of their respondents, as well as stated by Lee et al. (2016) in which perceived knowledge failed to translate into practices. Knowing the baseline knowledge and actual behaviours in a target group is essential for the development of effective health educational programmes [educational health programmes?]. Many consumers could benefit from food safety education and information (Altekruse et al., 1999; Bruhn and Schutz, 1999). In addition, it is also valuable to investigate the association between food safety knowledge across age, gender, level of education and income level.

The limitations of this study were that the data were collected using a convenience sampling approach that decreased the external validity of the results, and the residence area of the respondents was limited to only a small part of the Klang Valley, Kuala Lumpur, Malaysia. Thus, future studies should consider developing a systematic design to better represent the population.

## CONCLUSION

This study evaluated the consumption practices of consumers in Klang Valley, Kuala Lumpur, Malaysia. Based on the findings, it is evident that consumers were motivated to purchase RTE foods due to convenience, and they purchased RTE meals frequently. Consumers seems to be less price-sensitive compared to the convenience derived from minimized physical and mental effort they gained when purchasing RTE foods. Marketers could take opportunity with this data to help them understand consumer behaviour towards RTE meals. Further measures for this study to be conducted on a national basis would be beneficial, such as research to include smaller



towns and rural areas, with a bigger sample size to reflect the demographic composition of Malaysia. Apart from personal factor, other factors such as cultural factors, social factors, and psychological factors should be considered in determining consumers' behaviours.

The present study also assessed consumers' food safety knowledge. In general, consumers had adequately good knowledge on food safety. It would be valuable to investigate the association between food safety knowledge across age, gender, level of education and income level. It is also recommended to investigate the consumers' actual food handling practices to have an insight whether consumers' understanding on food safety corresponds to their food hygiene practices. Knowing the baseline knowledge and actual behaviours in a target group is essential for the development of effective health educational programmes.

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### REFERENCES

- Altekruse, S. F., Yang, S., Timbo, B. B., Angulo, F. J. (1999). A multi-state survey of consumer food-handling and food-consumption practices. *American Journal of Preventive Medicine* 16(3): 216-221.
- Bae, H. J., Chae, M. J., & Ryu, K. (2010). Consumer behaviors towards ready-to-eat foods based on food-related lifestyles in Korea. *Nutrition Research and Practice* 4(4): 332-338.
- Baskaran, S., Ayob, S. A., Howe, N. C., Mahadi, N. (2017). Understanding purchase intention of ready-to-eat food among Malaysian urbanites: a proposed framework. *International Journal of Academic Research in Business and Social Sciences* 7(11): 566-579.
- Bruhn, C. M. and Schutz, H. G. (1999). Consumer food safety knowledge and practices. *Journal of Food Safety* 19: 73-87.
- Brunner, T. A., Horst, V. D. K. & Siegrist, M. (2010). Convenience food products. Drivers for consumption. *Appetite* 55: 498-506.
- Carbas, B., Cardoso, L. & Coelho, A. (2013). Investigation on the knowledge associated with foodborne diseases in consumers of Northeastern Portugal. *Food Control* 30(1): 54-57.
- Candel, M. J. (2001). Consumer's convenience orientation towards meal preparation: Conceptualisation and measurement. *Appetite* 36: 15-28.
- Chae, M. J., Bae, H. J. & Yoon, J. Y. (2008). Consumption practices and selection attributes of the university students on ready-to-eat foods. *Korean Journal of Food Service Management* 11: 289-307.
- Feltes, M. M. C., Ariseto-Bragotto, A. P. & Block, J. M. (2017). Food quality, food-borne diseases, and food safety in the Brazilian food industry. *Food Quality and Safety* 1(1): 13-27.
- Fotopoulos, C., Krystallis, A., Vassallo, M. & Pagiaslis, A. (2009). Food choice questionnaire (FCQ) revisited. Suggestions for the development of an enhanced general food motivation model. *Appetite* 52(1): 199-208.

- Garayoa, R., Córdoba, M., García-Jalón, I., Sanchez-Villegas, A., Vitas, A. I. (2005). *Journal of Food Protection* 16(12): 2631-2636.
- Geeroms, N., Verbeke, W. & Kenhove, V. P. (2008). Consumers health-related motive orientation and ready meal consumption behavior. *Appetite* 51: 704-712.
- Heroux, M., Iannotti, R. J., Currie, D., Pickett, W., Janssen, I. (2012). The food retail environment in school neighborhoods and its relation to lunchtime eating behaviors in youth from three countries. *Health Place* 18(6): 1240-1247.
- Kennedy, J., Jackson, V., Cowan, C., Blair, I., McDowell, D., Bolton, D. (2005). Consumer food safety knowledge. Segmentation of Irish home food preparers based on food safety knowledge and practice. *British Food Journal* 107(7): 441-452.
- Lee, H. K., Halim, H. A., Thong, K. L., Chai, L. C. (2016). Assessment of food safety knowledge, attitude, self-reported practices, and microbiological hand hygiene of food handlers. *International Journal of Environmental Research and Public Health* 14(55): 1-14.
- Maysenburg, R., Albecht, J. A., Litchfield, R., Ritter-Gooder, P. K. (2014). Food safety knowledge, practices and beliefs of primary food preparers in families with young children. A mixed methods study. *Appetite* 73: 121-131.
- Muniady, R., Mamun, A. A., Permarupan, P. Y., Zainol, N. R. (2014). Factors influencing consumer behavior: A study among university students in Malaysia. *Asian Social Science* 10(9): 18-25.
- Olsen, N. V., Sijtsema, S. J., & Hall, G. (2010). Predicting consumers' intention to consume ready-to-eat meals. The role of moral attitude. *Appetite* 55(3): 534-539.
- Scholliers, P. (2015). Convenience foods. What, why, and when. *Appetite* 94: 2-6.
- U.S. Food and Drug Administration (USFDA) (2017). Food Code 2017. College Park, MD. United States Public Health Service, Food and Drug Administration.
- Woh, P. Y., Thong, K. L., Behnke, J. M., Lewis, J. W., Zain, S. N. M. (2016). Evaluation of basic knowledge on food safety and food handling practices amongst migrant food handlers in Peninsular Malaysia. *Food Control* 70: 64-73.
- World Health Organization. (2019). Food safety. Retrieved from [https://www.who.int/news-room/factsheets/detail/foodsafety#targetText=An%20estimated%20600%20million%20%E2%80%93%20almost,healthy%20life%20years%20\(DALYs\).](https://www.who.int/news-room/factsheets/detail/foodsafety#targetText=An%20estimated%20600%20million%20%E2%80%93%20almost,healthy%20life%20years%20(DALYs).)