Factors influencing consumption decision of fresh fruits from Malaysia: A case of foreign nationals in Malaysia

[1][*]Suntharalingam, C. and [2]Terano, R.

[1]*Malaysian Agricultural Research Development Institute, 43400 Serdang, Selangor, Malaysia*
[2]*Department of Agribusiness and Bio-Resource Economics, Faculty of Agriculture,Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia*

Abstract

This study was carried out as a move to increase Malaysia's fruit exports. The purpose of this study was to identify factors that influence the consumption decision of foreign nationals in Malaysia as move to understand their behavior and pattern in purchasing fresh fruits from Malaysia. This study was carried out in Malaysia among foreign nationals and it was found to be the first of its nature to be carried out in Malaysia. A total of eighty three respondents participated in six focus group discussions. Data was analyzed via exploratory factor analysis which is commonly used in examining consumer preferences and behavior. The three factors identified in influencing the consumption decision of Malaysian fresh fruits among foreign nationals were (1) price and fruit intrinsic attributes; (2) fruit physical aspects and uniqueness; and (3) occasion, familiarity and user status.

Introduction

Over recent years, there has been much discussion on Malaysia's trade balance in food. Malaysia's Balance of Trade (BOT) in food has been in the red for five years (2009 – 2013). The BOT registered a deficit of RM10,966 in year 2009 and it further aggravated to RM16,770 in 2013 (Table 1). One of the commodities that contributed to the deficit of BOT in food is fruits. Malaysia is a net importer of fruits, mainly temperate fresh and processed fruits and, juices. In 2009, the import value of fruits was RM1,240 million and it increased to RM2,150 million in 2013 over five years, demonstrating an average growth rate of 74% (Table 2).

Increase in population, a more affluent society, change in lifestyle and, inconsistent and unstable production of local fruits are some of the reasons contributing to the increased fruit import bill. During the same period, Malaysia's exports of tropical fruits amounted to RM518 million and RM676 million in 2009 and 2013, respectively, demonstrating an increase in 30.5% of export growth. With imports greater than exports, it is not surprising for the BOT in fruits to be in deficit.

In a move towards depicting a positive BOT in fruit, the Government of Malaysia via the Ministry of Agriculture and Agro-based industry formulated Malaysia Developmental Plans and Agrofood Policy. These plans and policy recommended strategies to

Table 1. Malaysia's food trade, 2009-2013 (RM million)

Item	2009	2010	2011	2012	2013
Export	15,714	18,099	20,494	20,620	22,030
Import	26,680	30,191	34,450	36,051	38,800
BOT	(10,966)	(12,092)	(13,956)	(15,431)	(16,770)

Source: Ministry of Agriculture and Agro-Based Industries 2009, 2013, 2014
Note: [*] BOT – Balance of Trade

Table 2. The balance of trade in fruits, 2009-2013 (RM million)

Item	2009	2010	2011	2012	2013
Exports	518	590	626	298	676
Imports	1,240	1,389	1,592	925	2,150
BOT	(722)	(799)	(966)	(627)	(1,474)

Source: Ministry of Agriculture and Agro-Based Industries 2009, 2013, 2014
Note: [*] BOT – Balance of Trade

increase fruits export value. Among the strategies suggested, one was in relation to understanding market needs of Malaysia's fresh fruits in foreign markets. It is with this in mind, this study was carried out among foreign nationals in Malaysia to ascertain the market needs of foreign consumers in Malaysia. Ideally, the study should have been carried out in Malaysia's key export markets, however, due to limited resources (i.e., time and funds), this study was carried out in Malaysia. This study aims to determine the underlying factors concerning purchasing decisions of fresh fruits among foreign consumers in Malaysia.

*Corresponding author.
Email: *chuba@mardi.gov.my*
Tel: +6 03 8953 6361
Fax: +6 03 8953 6370

Numerous articles have been published in relation to fruit intake and consumption. In a focus group study conducted by Miyauchi and Perry (1999), among Japanese consumers in relation to consuming fresh mangoes from Australia, the factors that were identified to influence popularization of new fruit were ease of consumption, presentation, price, knowledge of the best time to eat, general information on the fruit, sales promotion, taste, ease of consumption, healthiness and variation in the way to use the fruit. Four focus groups were carried out in this study, comprising two separate homogenous groups, i.e., 2 fruit buyers and 2 fruit eaters. The two groups of fruit eaters consist of males and females between the ages of 20-55 years, married and single individuals, and employed and students. Meanwhile, the two groups of fruit buyers comprised housewives, aged between 35-55 years, married with children, belong to the upper middle social class and they were either employed or unemployed.

Sensory appeal, familiarity and habit, social interactions, cost, availability, time constraints, personal ideology, media and advertising, and health were some factors found to affect food choice in relation to fruit and vegetable intake (Pollard et al., 2002). These factors were compiled through a broad literature review, involving a total of 494 articles from a number of databases, such as Cochrane Database of Systematic Reviews (CDSR1997-2001), the Database of Reviews and Effectiveness (DARE 1997-2001), MEDLINE (1990-July 2001), EMBASE, a major biomedical database (1980-July 2001), PSYCHinfo: Psychological abstracts (1998-July 2001) and the System for Information on Grey Literature in Europe.

Another factor that was found to be a decisive attribute for consumer in consuming fruits and vegetables was freshness (Wandel and Bugge, 1997; Ragaert et al., 2004; Peneau et al., 2006). This conforms to the findings of Babicz-Zielinska and Zagorska (1998) where freshness, taste and appearance of fruit were the three most important factors affecting the preferences of 100 students in Gdynia Maritime Academy, Polland pertaining to fruit intake. This study was carried out among 56 males and 44 females between the age of 22 to 25 years old.

The factors discussed above were compiled and used in the questionnaire of the current study. This paper proceeds with a brief discussion of the materials and methods used in this research, and research findings. It then describes the limitations of the research and offer suggestions for future research.

Materials and Methods

Research type

This study was a first of its kind carried out on consumption of Malaysian fruits among foreign nationals living in Malaysia. Due to this reason, qualitative method via Focus Group Discussions (FGD) was employed. FGD was utilized in this study since it was found to help in understanding the in-depth motivations and feelings of consumers (Mc Daniels and Gates, 1993). In addition, FGD is practical for generating marketing ideas (Hayes and Tathum, 1989) and obtaining people's perception, opinions and ideas on the research topic in a group discussion setting (Churchill, 1991; Kinnear and Taylor, 1996; Vaughn et al., 1996), as in this study. Additionally, FGD is found to best suited to exploratory, formative or process evaluation research (Monsen and Cheney, 1988). The FGD setting brought an important dimension to this study as we were able to elicit crucial information, i.e., influential factors concerning foreign nationals' consumption of local fruits through close interaction.

Sampling unit

Purposive sampling was employed in this study. According to Barbie (2003), purposive sampling is appropriate to be used in situations, such as in this study where a targeted sample was needed to be achieved quickly and where sampling for proportionality is not the primary concern. Patton (1990) stated that purposive sampling is appropriate when the study carried out has restrictions in terms of time and costs, has better access to the population and finding a sample in which the snowball process is much more effective, as in the case of the current study. Similar type of sampling was utilized by a group of researchers when studying cardiovascular health in rural women in West Virginia, USA using a FGD setting (Krummel et al., 2002).

Subjects and location of study

Official invitation letters were sent out to sixteen international schools and, various international affiliated associations and universities in the Klang Valley, Malaysia, where majority of the schools, universities and associations are located. The letters detailed and explained the purpose of the study. This was followed by telephone calls confirming participation. However, only four international schools and one university representatives participated in this study. The principals of the respective schools, parent-teacher association heads and lecturers were approached to discuss the

implementation of the FGDs. The foreign national school teachers, lecturers and staffs working in these schools and colleges along with parents of children attending these schools were the respondents in the FGDs. Various communication tools, namely newsletters, posters, school notice boards and emails were utilized in disseminating information regarding the study to target respondents.

Sample size

A total of eighty three respondents participated in six FGDs. The FGDs were held during recess period and/or after school in a quiet corner of the school canteen. The FGDs were carried out on separate days based on the availabilities of the respondents over a three-month period, i.e., during the fruit season which was between June and August. The duration of each FGD session was between 60 to 90 minutes, with an average of 73 minutes. The first FGD involved twenty two respondents; second FGD involved eight respondents; third FGD involved fourteen respondents; fourth FGD involved ten respondents; fifth FGD involved sixteen respondents; and the sixth FGD involved thirteen respondents. The moderator of the FGDs was the principal investigator of this study who has experience in moderating like-minded FGDs in the past. The research team members comprised primarily trained research assistants. They have carried out similar market studies previously and hence, were equipped with the required expertise and knowledge to assist in this study.

Research instrument

The questionnaire employed nominal and ordinal data type questions primarily and with some open-ended ones. The conceptualization of the questionnaire was based on past literatures as discussed above and through market observation. It was divided into five sections; (1) demographic profile of respondents; (2) respondents' consumption of fruits in general; (3) respondents' consumption of Malaysian preferred fruits; (4) stimulating consumption of Malaysian preferred fruits among respondents; and (5) export linkages. Sections (1) and (3) are reported in this paper as the other sections were compiled and reported to the Malaysian Agricultural Research and Development Institute, the organization that provided financial support for this study.

Statistical analysis

Data were analyzed both qualitatively and quantitatively. Qualitative data was gathered via feedback and observation that was compiled and summarized using content analysis in order to quantify the data. Content analysis is used to derive an in-depth description of the data (Monsen and Cheney, 1988). The Statistical Package of Social Sciences version 16.0 was used for all quantitative analyses. One analytical tool that has been used frequently in examining consumer preferences and behavior is exploratory factor analysis (EFA). EFA assumes that there is no theoretical knowledge that is relevant to guiding the factor extraction or to serve as hypotheses to be tested (Gorsuch, 1983). Using factor analysis in marketing research, enables researchers to express consumer ratings of products as a function of factors such as product quality and utility (Abdul Rahim, 2009).

In this study, this analysis was used for the purpose of data reduction, in which a set of measured variables is to be combined into summary indices. The goal is to discover optimal weightings of the measured variables so that a large set of related variables can be reduced to a smaller set of general summary scored that have maximal variability and reliability (Floyd and Widaman, 1995). The goal of data reduction is typically achieved by the use of Principal Component Analysis (PCA). Hence, in this study, PCA was used to portray the influential factors affecting respondents' decision to consume the fruits under study. Factor analysis and PCA have been discussed at length in many statistical books and studies (Harman, 1970; Mardia et al., 1979; Seber, 1984; Haris, 1985; Johnson and Wichern, 1988; Tabachnick and Fidell, 1989; Muhammad and Tengku, 2006). The basic assumption of PCA analysis is that underlying factors can be used to explain complex phenomena.

Past literatures suggest that explicit guidelines pertaining to sample size for PCA are not definitive. Coakes and Steed (1999) suggested that a minimum of five subjects per variable is required for PCA while Gorsuch (1983) argued that this subject-to-variables ratio is only sufficient for a sample size of 200. Streiner (1994), meanwhile recommended that with 100 participants, 5 participants per variable is needed while if it is less than 100 participants, 10 participants per variable is required.

Guadagnoli and Velicer (1988) challenged such rules and argued that no sound theoretical or empirical basis exists for across-the-board participant-to-variable ratio recommendations. Their Monte Carlo study suggested that variable saturation with the factors, indicated by the size of the factor loadings, along with the total sample size and the number of indicators per factor were in-fact important in determining the stability of factor solutions. Factor loadings indicate amount of

variability among consumer responses that can be explained by specific factors. For example, a high factor loading indicates a relatively high amount of variability among consumers' responses that can be explained by specific factors, thereby identifying absolutely important factors, as well as delineating those that jointly influence consumer responses (Thilmany et al., 2005). As such, the Monte Carlo study by Guadagnoli and Velicer (1988) suggested that as long as factor loadings are 0.80, solutions were highly stable across replicated samples, regardless of the number of indicators, even with a small sample size, i.e., 50 participants.

Meanwhile, they also indicated that when factor loadings were in the 0.60 range, stable solutions were obtained with sample sizes greater than 150 or with smaller sample size when each component contained at least four variables loading at 0.60. With the reasoning provided above, this study fulfilled the criteria above by focusing on selecting variables that have a factor loading over 0.60

Also, this study employed the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, which is an index for comparing the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients. The KMO suggests that a sampling adequacy greater than 0.5 is satisfactory to proceed with a PCA. Another indicator of the strength of the relationship among variables is Bartlett's test of sphericity. Bartlett's test of sphericity is used to test the null hypothesis that the variables in the population correlation matrix are uncorrelated. If the observed significance level is 0.0000, then it is small enough to reject the hypothesis. This concludes that the strength of the relationship among variables is strong.

Results and Discussion

Demographic profile of respondents

Out of 83 respondents, approximately 33% selected mangosteen, 29% selected rambutan, 20% selected starfruit and 18% selected durian as their preferred fruit choice (Table 3). The total number of female respondents was 61 while males were 22. Majority of respondents (66%) were in the age group of 21-40 years old. Forty one respondents (49%) acquired post-graduate education, 27 (33%) attained undergraduate degree while 15 (21%) obtained high-school and diploma qualification. Majority of the respondents (72%) are married. Sixty-percent of the respondents lived less than 3 years in Malaysia. Fifty-one percent (51%) of the respondents are either from Australia or United Kingdom.

Table 3. Demographic profile of respondents (N: 83)

Variable name	%
Fruit type	
Durian	18
Mangoesteen	33
Rambutan	29
Starfruit	20
Gender	
Female	74
Male	27
Age range	
21-30	23
31-40	43
41-50	23
51-60	12
Education	
Post-graduate	49
Undergraduate	33
High-school/diploma	18
Marital status	
Married with children	60
Married without children	12
Single	28
Number of years living in Malaysia	
<1 year	23
1 – <2 years	21
2 – <3 years	16
3 –<4 years	12
4 – <5 years	6
5 years and above	23
Home country	
Australia	27
New Zealand	5
United Kingdom	24
South Africa	5
India	6
Russia	6
Germany	10
Others	18

Consumption of fruits

Majority of respondents (60%) consumed fruits on a daily basis, 7 times a week. This depicts that fruits are an important component in their diet. This study found that all of the respondents do not consume durian, mangosteen and rambutan, on a weekly basis, even though these fruits are in season. The same is also reported for star fruit, although it is available all year long. The reason for lack of consumption of these fruits is because the respondents are not familiar with the appropriate consumption and utilization method of these fruits. However, with the knowledge and exposure they gain from this study, the respondents became wary of the correct consumption and utilization method of these fruits and hence, majority of them (81%) responded that they will consume these fruits in the future.

Principal component analysis

Nineteen influential fruit attributes listed in Table 4 were subjected to PCA. KMO measure of sampling adequacy is 0. 908 and p value of Barltett's test of sphericity is 0.000, both showed that the sample is adequate for PCA. Initial solution resulted in three factors (components) that had eigenvalues of more than one with a total of 67.43% variance explained.

Table 4. Fruit attributes that influence expatriates'
decision in consuming fresh fruits from Malaysia

Code	Variable
X1	Fruit shape
X2	Fruit size
X3	Fruit color
X4	Thickness of flesh/fruit
X5	Fruit/pulp texture
X6	Taste
X7	Aroma
X8	Seed size
X9	Water content
X10	Presentation of fruit
X11	Freshness
X12	Ease of consumption
X13	Fruit quality
X14	Uniqueness (something different)
X15	Health benefits
X16	Price
X17	Knowledge on when to consume
X18	Variation in the way to consume (different preparations)
X19	Use of fruit in the food service sector (restaurants, hotels, cafes etc.)

Table 5. Results of principal component analysis on factors influencing expatriates'
decision on consuming fruits from Malaysia

Components/items	Loadings[a]	Eigenvalue	% of Variance	Cronbach's alpha
1. Price and fruit intrinsic attributes[b]		10.42	54.86	0.880
Freshness	0.859			
Fruit quality	0.765			
Health benefits	0.712			
Price	0.614			
2. Fruit physical aspects and uniqueness		1.31	6.90	0.742
Fruit shape	0.816			
Fruit size	0.715			
Uniqueness	0.645			
3. Occasion, familiarity and user status		1.08	5.69	0.876
Aroma	0.758			
Variation in the way to consume	0.703			
Taste	0.703			
Knowledge on consumption	0.702			
Ease of consumption	0.612			

Note:
[a]After Varimax rotation.
[b]Variables with loadings less than 0.6 were omitted

The most frequently used criterion, i.e. Kaiser-Guttman for retaining components in principal component analysis is that components must have eigenvalues greater than 1.0 (Abdul Rahim, 2009). The Cronbach's alpha coefficient for all 3 components ranged from 0.742 to 0.880, which is highly satisfactory.

The components, items, factor loadings, eigenvalues, variance explained and reliability coefficients are presented in Table 5. The three components are (1) price and fruit intrinsic attributes; (2) fruit physical aspects and uniqueness; and (3) occasion, familiarity and user status. Component 1 explains 54.86% of the variance and has an internal validity of 0.880, indicating that price and fruit intrinsic attributes play an important role in influencing expatriates to consume Malaysian fruits. Examining the details, freshness had the highest loading of all the factors in component 1. Fruit quality and health benefits came in second and third, respectively, and followed closely by price. Other than price, the other items that fall under component 1 cannot be observed easily. While price indicates that it is an important item to consider in a fruit consumption decision, it is not the decisive factor. Freshness is the key to whether the respondent is willing to consume a fruit. Most respondents indicated during the FGD sessions that although they have observed these fruit types in their respective home countries, but they never consumed them as they doubted the freshness of these fruits.

The second component contributed 6.9% to the variance explained and has a Cronbach's alpha of 0.742. This indicates that the physical aspect of fruit could influence expatriates' decision on consuming Malaysian fruits; however the influence is lower than component 1. Judged by the loadings, fruit shape is an important attribute that is considered by expatriates when consuming Malaysian fruits.

The third component accounts for 5.69% of the variance explained and show a Cronbach's alpha of 0.876. The influence of this last component is the lowest. While aroma has the highest loading in this component; variation in the way to consume, taste and knowledge on consumption have relatively similar loadings. This indicates that the latter three items are equally important when one is deciding to consume Malaysian fruits. This is in accordance with a prior study that was carried out in United Kingdom, one reason why consumers do not try new fruits is because they were unaware of the proper consumption method (Henderson, 1992). The lowest loading on this last component is ease of consumption. In order to increase consumption of new fruits, Clarke and Moran (1995) suggested retailers should educate consumers on the preparation method and presentation of new fruits.

Conclusion

Generally, respondents were delighted to partake in this one-of-a-kind study on Malaysian fruits. This study was able to churn out pertinent findings in relation to factors influencing expatriates' decisions in consuming Malaysian fresh fruits. Among the nineteen fruit attributes that were studied, twelve were identified as influential factors. These factors were grouped into three components, price and fruit intrinsic attributes; fruit physical aspects and uniqueness; and occasion, familiarity and user status. Short term and long term strategies as suggested below can assist in increasing consumption of Malaysian fruits among foreigners.

Short term strategies

In order to increase purchases, it is important to position local fruits among popular and familiar fruits, i.e., apples and bananas. With the suggested positioning, the chances of consumers purchasing Malaysian fruits are relatively higher since they are easily visible and accessible.

In addition, leaflets and recipe cards detailing the fruit type, its consumption method and variation in consumption should also be placed strategically alongside with the respective fruits in order to educate consumers on our local fruits which hopefully translates this action into increase purchases.

These leaflets and recipe cards can also be placed at the soup, snack, dessert and pastry food shelves so as to introduce these fruits as enriching ingredients that can be added into the preparation of healthful diets such as these food types. The government published pamphlets that were utilized in this study was found to be an effective and trusted educational material in disseminating information to respondents on consuming Malaysian fruits. This corresponds with findings of Rimal et.al. (2001) and Unusan (2007) that although televisions and other mass media were found to reach wider target audiences, government publications are the most trusted source in effectively educating consumers.

Long term strategies

In order to sustain or improvise its competitive positioning in the tropical fruit market, Malaysia must customize its produce to meet the demand of local markets, especially in the area of technology and product quality (Rundh, 2003). According to Suntharalingam et al. (2011), innovative technologies must be developed and pursued to customize fruit varieties that adhere to specific requirements of various markets. Research and development efforts must also be intensified on producing fruit varieties that are rich in nutritional and health benefits. Post-harvest issues must be tackled so as to ensure that fruit freshness and quality are not compromised upon reaching the import markets.

Suntharalingam *et al.* (2011) also suggested that the effort of promoting and selling our fruits requires a marketing strategy that is equipped with high level of commitment from various stakeholders involved in the fruit industry, i.e., government, exporters and producers. There is a need to benchmark Malaysian fruits with successful foreign fruits such as California oranges, Washington apples and New Zealand Kiwi fruit to aggressively market them. In-store and on-the-shelf promotion should be carried out as strategic marketing efforts. A distribution kiosk for these fruits should be established in local countries and specialized agents should be stationed in these kiosks to distribute and manage these kiosks efficiently and effectively.

Limitations and suggestion for future research

This study churned out some pertinent findings in relation to foreign consumers' preferences on selected Malaysian fruits attributes. However, the results of this study are limited in which our sample size was small and the participants were not randomly selected. Hence, generalization cannot be assumed. Survey methods are recommended to be carried out as to confirm the findings of this study, establish some generalizability and provide greater contribution to consumer preference studies on fruits.

However, the research instrument used in this study via the utilization of FGDs, was indeed useful in gathering consumer perceptions of Malaysian

exotic fruits and as such can be used for large-scale consumer preference studies concerning Malaysian fruits. This conforms to Krueger (1994) and Stewart et al. (1994) findings, in which, suggest that focus groups develop high-quality quantitative instruments.

This study also established a need to conduct further research concerning the relationship between fruit intake along with health benefits and nutrition habits of the growing population, i.e., locals and foreigners in Malaysia. By doing so, the future study will be able to contribute and enrich findings of like-minded studies carried out in other countries which will aid in promoting healthy lifestyles among its population

Acknowledgements

References

Abdul Rahim, M. N. 2009. Statistical methods in research. Malaysia: Prentice Hall.

Babicz-Zielinska, E. and Zagorska, A. 1998. Factors affecting the preferences for vegetables and fruits. Polish Journal of Food and Nutrition Sciences 7(48): 755-762.

Barbie, E. 2003. The practice of social research. 10th ed. Belmont: Wadsworth Thomson Learning.

Churchill, G. A. 1991. Marketing research: Methodological foundations. 5th ed. Fort Worth: The Dryden Press.

Clarke, J. and Moran, A. 1995. An investigation into the current market for fruit in the UK and the measures taken to promote an increase in consumer consumption. Nutrition and Food Science 95(6): 5 – 10.

Coakes, S. J. and Steed, L. G. 1999. Factor analysis. In Coakes, S. J. (Ed). SPSS: Analysis without Anguish, p. 155. Queensland: John Wiley and Sons Ltd.

Guadagnoli, E. and Velicer, W. F. 1988. Relation of sample size to the stability of component patterns. Psychological Bulletin 103: 265-275.

Harman, H. H. 1970. Factor analysis model. In Harman, H. H. (Ed). Modern Factor Analysis, 2nd ed., p. 298-324. London: Academic Press.

Haris, R. J. 1985. Factor analysis. In Haris, R. J. (Ed). A Primer of Multivariate Statistic, 2nd ed., p. 298-324. London: Academic Press.

Hayes, T. J. and Tathum. C. B. Focus group interviews: A reader. 2nd ed. Chicago: American Marketing Association.

Henderson, D. 1992. Exotic produce: The changing market in the UK. British Food Journal 94(8): 19-24.

Johnson, R. A. and Wichern, D. W. 1988. Factor analysis and inference for structured covariance matrices. In Johnson, R. A. and Wichern, D. W. (Eds). Applied Multivariate Statistical Analysis, 2nd ed., p. 378-430. New Jersey: Prentice Hall.

Kinnear, T. C. and Taylor, J. R. 1996. Marketing research: An applied approach. 5th ed. New York: McGraw-Hill Inc.

Krueger, R. A. 1994. Focus groups: A practical guide for applied research. Thousand Oaks: Sage Publications.

Krummel, D. A., Humphries, D. and Tessaro, I. 2002. Focus groups on cardiovascular heath in rural women: Implications for practice. Journal of Nutrition and Behavior 34: 38-46

Mardia, K. V., Kent, J. T. and Bibby, J. M. 1979. Factor Analysis. In Mardia, K. V., Kent, J. T. and Bibby, J. M. (Eds). Multivariate Analysis, p. 253-280. London: Academic Press.

McDaniels, C. J. and Gates, R. 1993. Contemporary marketing research. New York: West Publishing Company.

Ministry of Agriculture and Agro-Based Industries. 2009. Agricultural statistical handbook. Putrajaya: Ministry of Agriculture and Agro-Based Industries.

Ministry of Agriculture and Agro-Based Industries. 2013. Agricultural statistical handbook. Putrajaya: Ministry of Agriculture and Agro-Based Industries.

Ministry of Agriculture and Agro-Based Industries. 2014. Agricultural statistical handbook. Putrajaya: Ministry of Agriculture and Agro-Based Industries.

Miyauchi, Y. and Perry, C. 1999. Marketing fresh fruits to Japanese consumers: Exploring issues for Australian exporters. European Journal of Marketing 33(1/2): 196-205.

Monsen, E. R. and Cheney, C. L. 1988. Research methods in nutrition and dietetics: Design data analysis and presentation. Journal of the American Dietetic Association 88: 1047-65.

Muhammad, S. M. N. and Tengku, M. A. T. A. 2006. Problems and constraints of the local herbs and medicinal plants processing industry. Economic and Technology Management Review 1(1): 61-70.

Patton, M. Q. 1990. Qualitative evaluation and research methods. Newbury Park: Sage Publications.

Peneau, S., Hoehn, E., Roth, H. R., Escher, F. and Nuessli, J. A. 2006. Importance and consumer perception of freshness of apples. Food Quality and Preference 17: 9-19.

Pollard, J., Kirk, S. F. L. and Cade, J. E. 2002. Factors affecting food choice in relation to fruit and vegetable intake: A review. Nutrition Research Reviews 15: 373-387.

Ragaert, P., Verbeke, W., Devlieghere, F. and Debevere, J. 2004. Consumer perception and choice of minimally processed vegetables and packaged fruits. Food Quality and Preference 15: 259-270.

Rimal, A., Fletcher, S. M., McWatters, K. H., Misra, S. K. and Deodhar, S. 2001. Perception of food safety changes in food consumption habits: A consumer analysis. International Journal of Consumer Studies 25(1): 43-52.

Rundh, B. 2003. Rethinking the international marketing strategy: New Dimensions in a competitive market. Marketing Intelligence and Planning 21(4): 249-250.

Seber, G. A. F. 1984. Dimension Reduction and Ordination. In Seber, G. A. F. (Ed.). Multivariate Observations, p. 175-204. New York: John Wiley.

Stewart, B. O., Olsen, D. and Goody, C. 1994. Converting focus group data on food choices into a quantitative instrument. Journal of Nutrition Education and Behavior 26: 34-36.

Streiner, D. L. 1994. Figuring out factors: The use and misuse of factor analysis. Canadian Journal of Psychiatry 39:135-140.

Suntharalingam, C., Tengku, M. A. T. A., Abu, K. A., Rusli, R. and Noorlidawati, A. H. 2011. Competitiveness of Malaysia's fruits in the global agriculture and selected export markets: Analyses of revealed comparative advantage (RCA) and comparative export performance (CEP). Economic and Technology Management Review 6: 1-17.

Tabachnick, B. G. and Fidell, L. S. 1989. Principal components and factor analysis of a survey. In Tabachnick, B. G. and Fidell, L. S. (Eds). Sampling Methods of Censuses and Survey, 4th ed., p. 108-130. London: Charles Griffin.

Thilmany, D. D., Umberger, W. J. and Ziehl, A. R. 2005. Strategic market planning for value-added natural beef products: A cluster analysis of Colorado consumers. Renewable Agriculture and Food Systems 21(3): 192-203.

Unusan, N. 2007. Consumer food safety knowledge and practices in the home in Turkey. Food Control 18(1): 45-51.

Vaughn, S., Schumm, J. S. and Sinagub, J. 1996. Focus group interviews in education and psychology. Thousand Oaks: SAGE Publications.

Wandel, M. and Bugge, A. 1997. Environmental concern in consumer evaluation of food quality. Food Quality and Preference 8(1): 19-26.