

## **The influence of consumer characteristics on the acceptance of new seaweed food products**

**Phang Ing @ Grace**  
**Lee Yoon Ling**  
**James Eng @ James Mohd Alin**  
Universiti Malaysia Sabah  
gracep@ums.edu.my

### **Abstract**

This paper examines the factors that influence the acceptance of the new products. 304 participants from ages 16 and above were each given a sample of seaweed cake, seaweed chocolate, seaweed crackers and seaweed biscuits to taste. Data on consumers' characteristics and consumers' willingness to accept these products were collected through a self-administered questionnaire. The study shows that consumers' characteristics play a significant role in the food choice. Beliefs the consumers hold about the outcome of accepting the new food products will strongly affect his/her acceptance of the new seaweed food products.

### **Introduction**

Over the decades there have been growing trend for value added food products instead of for greater quantities of food (Imram, 1999) and increasing demand for more convenient and fresh food (Olajide *et. al.*, 2006). Hence, food companies must continue to be innovative in developing new processing technologies and formulating new food products in order to thrive and cope with the changes in consumer behavior that is becoming fragmented and less predictable or consistent. Furthermore, departures from established food patterns have been observed by Goode *et.al.* (1995) on what we eat, where we eat, with whom we eat and even in the ways in which we judge the acceptability or appropriateness of given food items. These changes might caused by fundamental shifts in gender roles, rise in net income worldwide, and changes in the supply side processes related to the abundance of relatively cheap food. Some have further attributed these changes to the globalization of business that facilitated for locals to have available more foreign products at an affordable price (Forlani and Parthasarathy, 2003).

Changed patterns of eating have been observed like having snacks instead of a main meal or in the irregularity where the family shares a meal together (Goode *et.al.*, 1995); individualism at the table and also tendency to have a variety of meals served that indulges in individual preferences and tastes of the family members. Weight control and consumers' concerns about food safety have been cited among most popular reasons for diet change (Goode *et.al.* , 1995) and have resulted in the erosion of the traditional and taken-for-granted ideas for food and led to a demand for new and natural food products.

Despite the pressure to develop new food products to meet the consumers' changing tastes, only a handful has been successful (Imram, 1999). The first reason for the lack of success is that very few products are properly formulated. Second, food product development is limited by the market's willingness to test and accept new or improved food products. Third, the products have to suit the market into which they are being introduced. Lastly, he concludes

that food companies are not market-orientated enough, that is the failure to recognize customer's requirements during the development of the product.

This paper examines the influence of consumer characteristics on the acceptance of new seaweed products by looking into whether the three main characteristics: consumer innovativeness, beliefs and knowledge of the consumer will have impacts on the acceptance of new seaweed products. The paper is further divided into four sections. The first section of the paper reviews the relevant literature; second part focuses on the methodology used to test the framework, followed by data findings and discussion in the next section.

### **Review of literature**

Specifically, diffusion research in marketing started around the 1960s when marketing managers had become worried about the high failure rates of new consumer products. It was estimated that 92% of approximately 6,000 new consumer items introduced each year (Conner, 1964) had failed to gain acceptance by the consumers. They were concerned with how new products could be launched more efficiently.

Psychological studies were carried out to identify the personality traits of these innovators. They then coined the term "consumer innovativeness" to describe an innate personality trait of novelty seeking that relate to new product consumption behavior and motives. Midgley and Dowling (1978) proposed that "innovativeness" as the "degree to which an individual is receptive to new ideas and makes innovation decisions independently of the communicated experience of others".

Goldsmith (1992) further added that the willingness of the consumer to try new things is domain-specific that is he may display innovativeness only in certain product groups and not necessarily in all. However, Steenkemp (1999) suggests that there may be a gap between innovativeness and the adoption behavior (Steenkemp, Hofstede and Wedel, 1999) in that people high in innovativeness might not be among the earliest adopters of the new products. It is therefore postulated that to convert a consumer who has the quality of having consumer innovativeness into buying of new products it will have to be mediated by situational factors like marketing and promotions undertaken.

Fishbein and Ajzen's (1975) explained the theory of reasoned action concentrates on evaluating attitudes towards a behavior in which the individual has control. The attitude towards a behavior is predicted by salient beliefs that an individual holds about the outcome of a behavior (*attitudinal beliefs*), weighted by his or her estimation of the likelihood that performing the behavior would result in a given outcome. The second component refers to the influence of other people (the salient referents) in respect to the behavior in question –called "*subjective norms*". The influence depends on the beliefs of the referents themselves (normative beliefs) expressed in the advice provided and the individual's motivation to comply with that advice.

In food choice, Thompson *et. al.* (1994) found that attitudinal beliefs especially those concerning flavor enhancement were important predictors in the subsequent adoption of the new food products and followed by the beliefs about enhancing one's health. The researchers also found that due to low involvement nature, attitudinal beliefs could successfully predict the behavioral intention in food choice, whilst subjective norms could not. As such the consumer feels little pressure to comply with beliefs of their salient referents.

On the other hand, “Knowledge” refers to the information that a person possesses such as the linkages between diet and health or about processed and packaged foods; so as to form a basis for food choice (Goode *et.al.*, 1995). In relation to food, there is positive relationship between having a intimate knowledge and willingness to purchase new products (Goldsmith *et al.*, 1998) and also the perceived naturalness of the products with likelihood to purchase (Frewer *et al.*, 1995).

However, a cross-cultural study (Goode, 1992) on whether the government, businesses or farmers could be trusted to provide safe food supply at affordable prices in USA and Japan found out that the consumers in both countries have the greatest mistrust about food safety in food companies (60.1%) followed by the government (52.9%) despite of the culture differences. Consumers would like to be given dependable information especially when food scares occur (Yeung and Morris, 2001). People often perceive higher risk when they think that they have not been well informed and that their right to free choice had been compromised and this will have a negative correlation to purchase behavior (Yeung and Morris, 2001). As such, they would adopt risk-reducing strategies such as purchasing branded or quality assured products or by seeking advice or endorsements from trusted sources.

Other concerns such as labelling were viewed as a gimmick or advertising ploy (Hill *et al.* 2002) and deeply mistrusted by the consumers (Frewer *et.al.* 2003). In order to overcome the consumers’ mistrust, food manufacturers should provide the up-to-date information and acknowledge the uncertainties inherent in the risk analysis and of any claims for the potential benefits in those products (Frewer *et.al.* 2003).

### **Methodology**

The purpose of this study is to examine the relationships between the various variables relating to the personal characteristics of the consumers, namely their consumer innovativeness (a personality trait); their beliefs to the outcome of buying seaweed food products; and knowledge about seaweed itself. The method of sampling adopted had been one of convenience sampling of the public who visited the shopping malls in the Kota Kinabalu city during a public holiday weekend. Based on the previous studies done by Goldsmith and Hofackers (1992); Thompson, Kaziris and Alekos (1994); and Goldsmith and Flynn (1992), the theoretical framework in Appendix 1 is developed to test the following hypotheses:

Hypothesis 1: There is a significant relationship between the consumer’s innovativeness and the acceptance of new seaweed food products.

Hypothesis 2: There is a significant relationship between the beliefs that a consumer hold about the outcome of accepting the new food products and his acceptance of the new seaweed food products.

Hypothesis 3: There is a significant relationship between the consumer’s knowledge about seaweed and his acceptance of the new seaweed food products.

### **Findings and discussion**

Self administered questionnaires were distributed to shopping mall shoppers around Kota Kinabalu area and a total of 304 questionnaires collected were useable. The majority of the respondents were aged less than 35 years (65.5%), female (58.6%), single (52.4%), with

income earning less than RM1500 per month, who spent averagely RM85 per month on food items such as cakes, biscuits, chocolate and crackers.

All the data have been pre-tested in pilot test for 25 respondents. The scores of the factor analysis are above 0.6 for each sub dimensions tested. Then the real run of the survey are carried out and the results are assessed for reliability and validity by using Cronbach's alpha and factor analysis. The results (see Appendix 2 and 4) showed all sub dimensions are above acceptable level of 0.6 for both tests (Hair *et al.*, 1998), except the low Cronbach's Alpha score for consumer innovativeness of 0.425.

The results of the factor analysis for all three independent variables confirmed the questionnaire coincide with the theoretical framework. However, there is one extra dimension (Peer Influence) that we are able to identify from the data. Due the significance of the questions, this dimension is kept for result comparison. The over all KMO and Barlett's test results are acceptable (Hair *et al.*, 1998). The total score of the eigen values explained using Principal Component Analysis is 65.54% and the communalities for all the sub dimensions are above 0.5.

Data is tested using Pearson Correlation (see Appendix 5) and the results showed all three independent variables (Knowledge, Customer Innovativeness and Beliefs) have significant positive relationships with respondents' acceptance. In other words, a consumer who has more knowledge, innovative and believe in seaweed food products will have higher acceptance of these products. Among the three independent variables, consumers' belief scored the highest. Meanwhile, the extra dimension (Peer Influence) which we have added into the framework before found to have no significant relationship with the product acceptance.

The first component in consumers' personal characteristics is consumer innovativeness. It is considered to be a personality trait possessed by people who are eager to try out new products. The statements used in the questionnaire were adopted from Goldsmith and Hofacker's (1991), and is measured by the domain specific innovativeness (DSI) scale. This scale has been found to be reliable and valid as a measure of innovativeness or the tendency of consumers to be among the first to try new products in a specific product field and the DSI scale has been used in several other studies (Goldsmith *et.al.*, 1992, 1998; McCarthy *et. al.*, 1999, 2001). However in this study, consumer innovativeness does have a significant, positive but comparatively weaker relationship with product acceptance.

The second component in the consumers' characteristics is beliefs. Thompson *et. al.*, (1994, 1996) in their studies concluded that beliefs had a significant relationship to the outcome for the acceptance of new food products. The findings in this study agree to the findings above. In our study, it is considered to have the greatest influence on consumer acceptance when compared to the other factors.

The last component in this section of consumers' characteristics is knowledge. Knowledge is said to form a basis for food choice (Goode *et.al.*, 1995). Martinez *et.al.*, (1998) reported that at the early stages of innovation, the influence of publicity is the greatest. After which diffusion occurs by word-by-mouth (Hair *et.al.*, 1998). Chudhuri (1994) in his case study on the diffusion of palm oil in Indonesia in the early 1980's also noted that diffusion of knowledge had to pre-empt any introduction of a new product. The findings in the study confirm that knowledge has a significant, positive but fairly moderate relationship to acceptance.

The results of the survey are tally with the conceptual framework. Beliefs the consumers hold about the outcome of accepting the new food products will strongly affect his/her acceptance of the new seaweed food products. As discuss earlier in the literature review, seaweed products is categorized under low involvement products which consumers don't spend much time and effort before purchase. Attitudinal beliefs on the taste and nutrition of the seaweed products could successfully predict the behavioural intention in food choice, whilst subjective norms such as 'peer influence' could not. In our study, peer influence has proven to have no significant relationship with the acceptance of the seaweed products.

### **Conclusion**

Given that the properties of seaweed in the products tested are not distinctive, the marketing strategy adopted should concentrate on the consumers' characteristics, especially beliefs (Thompson *et.al.*, 1994; 1996) and knowledge (Goode *et.al.*, 1995; Chudhuri, 1994). Due to the reason that consumer innovativeness does showed significant and positive (Goldsmith *et.al.*, 1992, 1998; McCarthy *et.al.*, 1999, 2001) but comparatively weaker relationship with product acceptance, consumer education is in need. Background works such as dissemination of information on the nutritional values and on how to use seaweed in our meals would increase the possibility of product trial. Furthermore the target group for the new products would be those who display high individualism and who spend at least RM50 per month on this category of food.

However one needs to consider further as to what to do next in order to ensure a successful launch for these products into the market. It is vital to clearly define the market within which the product is competing, that is to know what other products should be monitored that is in direct or indirect competition with these new ones. The entrepreneur will need to look at their costs and see if the new products can compete with other similar products that presently exist. Furthermore the views of the producer, the retailers and the consumers on the products introduced should be sought. For example, a retailers' view can strongly influence where he or she positions the product in the store and this in turn can determine the purchase intentions of the consumer. Next, would be to decide on which distribution channels or types of stores to use. One would need to take into account the range and repertoire of outlets used by the consumer for in Malaysia as in Singapore for it is known that a lower proportion of purchases are made in the supermarkets or shopping malls when compared to the Western countries. This can have ramifications on interpreting the results from studies like this one where the survey had been carried out in a shopping mall (Wong, 1999).

### **References**

- Aaker,D, Kumar, V and Day, G (2004). *Marketing Research*, 8<sup>th</sup> edition. John Wiley and Sons Inc. United States.
- Alexandris, K. Dimitriadis, N. and Markata, D (2002). Can perceptions of service quality predict behavioral intentions? An exploratory Study in the Hotel Sector in Greece. *Managing Service Quality*, 12(4): 224-231.
- Arjun Chaudhuri (1994), The diffusion of an innovation in Indonesia. *Journal of Product and Brand Management*, 3(3): 19-26.
- Asma Abdullah (1992). Leading and motivating the Malaysian workforce. *Malaysian Management Review*, 24-41.

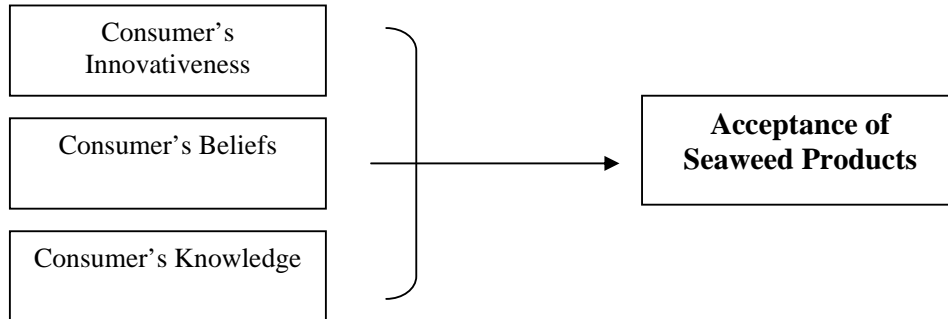
- Azanza, MP and Basman IC (1999). Consumer acceptance of quick cooking rice as food for use in a disaster. *Journal of Consumer Studies and Home Economics*, 23(4): 225-230.
- Bearden WO, Ingram TN, and LaForge RW (2004). *Marketing- Principles and Perspectives*. 4<sup>th</sup> edition and International edition. McGraw Hill New York, United States.
- Beaudoin, P, Lachance, MJ and Robitaille J (2003). Fashion innovativeness, fashion diffusion and brand sensitivity among adolescents. *Journal of Fashion Marketing and Management*, 7(1): 23-30.
- Brown K, McIlveen H and Strugnell C (2000). Nutritional awareness and food preferences of young consumers. *Nutrition and Food Science*. 30(5): 230-235.
- Choong LH (1998). The theory of reasoned action applied to brand loyalty. *Journal of Product and Brand Management*, 7(1): 51-61.
- Daghfous, N Petrof, J,V, and Pons, F (1999). Values and adoption of innovations: a cross-cultural study. *Journal of Consumer Marketing*, 16(4): 314-331.
- Eastwood, DB (1994). Consumer Acceptance of a new experience good: a case study of vacuum packed fresh beef. *Journal of Consumer Affairs*, Winter 28 (2).
- Eastwood, DB (1998). Consumer acceptance of a new product: A case of pre-cut carrots. *Consumer Interests Annual*, 02751356, 44.
- Forlani D and Madhavan Parthasarathy (2003). Dynamic market definition: an international marketing perspective. *International Marketing Review*, Vol.20 No. 2 pp142-160.
- French JA, Blair AJ and Booth DA (1994). Social situation and emotional state in Eating and Drinking. *British Food Journal*, 96(1): 23-28.
- Frewer L, Scholderer J and Lambert N (2003). Consumer Acceptance of functional foods: issues for the future. *British Food Journal* , 105(10): 714-731.
- Frewer, LJ, Howard, C and Shepherd R. (1995). Genetic engineering and food: what determines consumer acceptance? *British Food Journal*, 97 (8): 31-36.
- Gaddis, S.E. (1998). How to Design Online Surveys. *Academic Search Elite*, 52(6).
- Goldsmith, R and Flynn, LR. (1992). Identifying Innovators in Consumer Product Markets. *European Journal of Marketing*, 26(12): 42-55.
- Goldsmith, R, E, d'Hauteville, F, and Flynn, L.R. (1998). Theory and measurement of consumer innovativeness. *European Journal of Marketing*, 32(3/4): 340-353.
- Goode J, Beardsworth A, Haslam C, Kiel T and Sherratt E. (1995). Dietary dilemmas: nutrition concerns of the 1990s. *British Food Journal*, 97(11): 3-12.
- Hair, J.F. Jr., Anderson, R.E., Tatham R.L. and Black W.C. (1998). *Multivariate Data Analysis*, Fifth edition, New Jersey Prentice Hall.
- Hair, J.F. Jr., Bush R.P., Ortinau D.J. (2000). *Marketing Research – A practical approach for the new millennium*. International edition. Irwin McGraw Hill United States.

- Hill, DS, Knox, B, Hamilton, J, Parr, H and Stringer, M. (2002). Reduced-fat foods: the shopper's viewpoint. *International Journal of Consumer Studies*, 26(1): 44-57.
- Howard, JA and Sheth, JN. (1967). A theory of buyer behavior. In *Marketing Classics – A Selection of Influential Articles* (8<sup>th</sup> edition), Enis BE, Cox KK and Mokwa MP (1995) Prentice Hall, New Jersey US: 137-155
- Howley M, Criteria for Success in New Product Development for Consumer Goods: A Comparative Study. *New Product Development*, 55-60.
- Hussey, M and Hooley G. (1995). The diffusion of quantitative methods into marketing management. *Journal of Marketing Practice: Applied Marketing Science*,. 1(4): 13-31.
- Imram, N (1999). The role of visual cues in consumer perception and acceptance of a food product. *Nutrition and Food Science*, 99 (5): 224-230.
- Kotler, P and Armstrong, G. (2004). *Principles of Marketing*, 10<sup>th</sup> edition. New Jersey, United States Pearson-Prentice Hall.
- Lynn, M, and Gelb, B, D. (1996). Identifying innovative national markets for technical consumer goods. *International Marketing Review*, 13(4): 43-57.
- Martinez E, Polo Y and Flavián C. (1998). The acceptance and diffusion of new consumer durables: differences between first and last adopters. *Journal of Consumer Marketing*, 15(4):323-342.
- McCarthy, M, O'Reilly, and Cronin, M. (2001). *Psychological, attitudinal and behavioral characteristics of Irish Specialty Cheese Customers*, 103(5): 313-330.
- McCarthy, M, O'Sullivan, C and O'Reilly, S (1999). Pre-identification of first buyers of a new food product. *British FOOD Journal*. 101(11): 842-856.
- Norziah, Mohd.Hani and Chio, YC. (2000) Nutritional composition of edible seaweed *Gracilaria Changgi*. *Food Chemistry*, 68: 69-76
- J.O. Olajide, A.A. Adedeji, B.I.O. Ade-Omowaye, E.T. Otunola and J.A. Adejuyitan (2006). Potentials of high intensity electric field pulses (HELP) to food processors in developing countries. *Nutrition and Food Science*, 36(4): 248-258
- Poor college students Ain't what they used to be (1999). *Marketing News*. In Bearden, Ingram and Leforgé [2].
- Reed, Z and Mcliveen-Farley H and Strugnell, C. (2003). Factors affecting consumer acceptance of chilled ready meals on the island of Ireland. *International Journal of Consumer Studies*. 27(1) January, 2-10
- Rogers EM (1976). New Product adoption and diffusion. In *Marketing Classics – A Selection of Influential Articles* (8<sup>th</sup> edition), Enis BE, Cox KK and Mokwa MP (1995) Prentice Hall, New Jersey US: 192-207.
- Steenkemp, Jan-Benedict E.M., Hofstede, Frenkel ter and Wedel M. (1999). A cross national investigation into the individual and national cultural antecedents. *Journal of Marketing*. April, 63.

- Steenkemp, Jan-Benedict E.M.(2001). The role of national culture in international marketing research. *International Marketing Review*. 18(1): 30-44
- Thompson KE and Panayiotopoulos P [1999]. Predicting behavioural intention in a small business context. *Journal of Marketing Practice: Applied Marketing Science* 5(3): 89-96
- Thompson KE, Haziris N. and Alekos PJ [1994]. Attitudes and Food Choice Behaviour. *British Food Journal*, 96(1): 9-13
- Thompson NJ and Thompson KE [1996]. Reasoned action theory: an application to alcohol-free beer. *Journal of Marketing Practice: Applied Marketing Science* 2(2): 35-48.
- Venkatraman, MP [1991]. The Impact of Innovativeness and Innovation type on Adoption. *Journal of Retailing*, 67 (1): 51-67.
- Vranešević T and Ranko Stanandccaron;ec [2003]. The effect of the brand on perceived quality of food products. *British Food Journal*, 105(11): 811-825.
- Wong, T.Q. (1999). *Marketing research*. 3<sup>rd</sup> ed. Reed Educational and Professional Publishing Ltd., Great Britain, in conjunction with the Marketing Institute of Singapore.
- Yeniyurt S and Townsend JD [2003]. Does culture explain acceptance of new products in a country?- an empirical investigation. *International Marketing Review*, 20(4): 377-396.
- Yeung RMW and Morris J [2001]. Food safety risk- Consumer perception and purchase behaviour. *British Food Journal*, 103(3): 170-187.



**Appendix 1: Theoretical Framework**



*Modified from the previous research by Goldsmith and Hofackers (1992); Thompson, Kaziris and Alekos (1994); and Goldsmith and Flynn (1992).*

**Appendix 2: Factor Analysis  
 Rotated Component Matrix**

Dimension	Sub dimensions	Component Scores
Beliefs	Availability of product	<b>.781</b>
	Family Acceptance	<b>.742</b>
	Value for Money	<b>.712</b>
	Environmentally friendly	<b>.658</b>
Knowledge	Rich in Vitamins	<b>.775</b>
	Low calorie	<b>.772</b>
	Rich in minerals	<b>.760</b>
	Contains dietary fibers	<b>.711</b>
Consumer Innovativeness	Know more about the products	<b>.847</b> <b>.639</b>
	Know about the availability of the products	
Peer Influence	First to know the products	<b>.828</b>
	Buy more new food products	<b>.763</b>
	The first to buy new food products	<b>.743</b>

*Extraction method: Principal Component Analysis and Rotated Method: Varimax with Kaiser Normalization.*

*the influence of consumer characteristics on the acceptance  
of new seaweed food products*

**Appendix 3: KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		
		.825
Bartlett's Test of Sphericity	Approx. Chi-Square	1297.059
	df	78
	Sig.	.000

**Appendix 4: Reliability Statistics**

Dimension	Cronbach's Alpha
Beliefs	.784
Knowledge	.835
Consumer Innovativeness	.425
Peer Influence	.691

**Appendix 5: Pearson Correlation**

		Knowledge	Customer Innovativeness	Beliefs	Peer Influence	Purchase Intention
Knowledge	Pearson Correlation	1	.141(**)	.571(**)	-.067	.497(**)
	Sig. (1-tailed)	.	.007	.000	.120	.000
Customer Innovativeness	Pearson Correlation	.141(**)	1	.100(*)	.171(**)	.202(**)
	Sig. (1-tailed)	.007	.	.041	.001	.000
Peer Influence	Pearson Correlation	-.067	.171(**)	-.097(*)	1	-.033
	Sig. (1-tailed)	.120	.001	.045	.	.281
Beliefs	Pearson Correlation	.571(**)	.100(*)	1	-.097(*)	.706(**)
	Sig. (1-tailed)	.000	.041	.	.045	.000
Purchase Intention	Pearson Correlation	.497(**)	.202(**)	.706(**)	-.033	1
	Sig. (1-tailed)	.000	.000	.000	.281	.

\*\* Correlation is significant at the 0.01 level (1-tailed).

\* Correlation is significant at the 0.05 level (1-tailed).