


**INTRINSIC AND EXTRINSIC ATTRIBUTES,  
ATTITUDE TOWARDS SEAWEED CRACKERS  
AND PURCHASE INTENTION OF SEAWEED  
CRACKERS PRODUCTS DEVELOPED BY  
SCHOOL OF FOOD SCIENCE AND  
NUTRITION, UNIVERSITI MALAYSIA SABAH**

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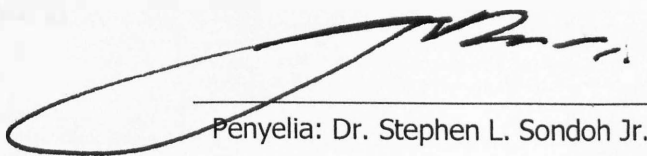
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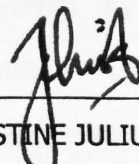
  
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## ABSTRACT

### **INTRINSIC AND EXTRINSIC ATTRIBUTES, ATTITUDE TOWARDS SEAWEED CRACKERS AND PURCHASE INTENTION OF SEAWEED CRACKERS PRODUCTS DEVELOPED BY SCHOOL OF FOOD SCIENCE AND NUTRITION, UNIVERSITI MALAYSIA SABAH**

Seaweed can be a very attractive natural source of new compounds with biological activity. In view of that, School of Food Science and Nutrition produced Seaweed Crackers for research purposes. The objectives of this study were to examine the consumers' perception based on intrinsic and extrinsic attributes and purchase intention towards seaweed crackers product at various schools and department in Universiti Malaysia Sabah. The study also examines the mediating effect of attitude towards seaweed crackers attributes on the relationship between intrinsic and extrinsic attributes and purchase intention. 134 respondents were used for the statistical analysis of which collected from different schools and departments in Universiti Malaysia Sabah using purposive sampling method. The results show that ingredients and price have a significant influence on purchase intention while other attributes such as brand name, texture, packaging, and ingredients have significant with attitude towards seaweed crackers attributes only. The regression analysis results show that attitude towards seaweed crackers attributes fully mediates the relationships of purchase intention and partially mediates the relationship with ingredients attributes. Based on the findings, only ingredients attribute found to significantly influence to both attitude towards seaweed crackers attributes and purchase intention. Price attributes has significant effect on purchase intention and insignificant effect on attitude. Other attributes namely brand name, packaging, and texture have significant effect on attitude towards seaweed crackers attributes, however, insignificant effect on purchase intention. Both colour and artificial flavour have no significant to attitude towards seaweed crackers attributes and purchase intention. The results suggest that manufacturers or researchers should focus on ingredients attributes in order to meet their consumers' expectation. This study also included the limitation of the study and recommendation for future researchers.

## ABSTRAK

Rumpai laut boleh menjadi sumber sebatian semulajadi baru yang sangat menarik dengan aktiviti biologi. Sehubungan itu, Sekolah Sains Makanan dan Pemakanan menghasilkan Keropok Rumpai Laut untuk tujuan penyelidikan. Objektif kajian ini adalah untuk mengkaji persepsi berdasarkan ciri-ciri intrinsik dan ekstrinsik dan niat pembelian pengguna ke atas produk keropok rumpai laut di pelbagai sekolah dan jabatan Universiti Malaysia Sabah. Kajian ini juga mengkaji kesan pengantara sikap pengguna dengan ciri-ciri intrinsik dan ekstrinsik dan niat pembelian. 134 orang responden telah digunakan untuk analisis statistik yang dikumpul dari sekolah dan jabatan yang berbeza di Universiti Malaysia Sabah menggunakan kaedah persampelan bertujuan. Hasil kajian menunjukkan bahawa bahan-bahan dan harga mempunyai pengaruh yang besar ke atas niat pembelian manakala ciri-ciri lain seperti jenama, tekstur, pembungkusan, dan bahan-bahan mempunyai signifikan dengan sikap terhadap keropok rumpai laut. Keputusan analisis regresi menunjukkan bahawa sikap terhadap keropok rumpai laut merujuk sepenuhnya pengantara hubungan niat pembelian dan sebahagian menjadi pengantara hubungan dengan ciri-ciri bahan. Berdasarkan dapatan kajian, hanya bahan-bahan diuji dengan signifikan mempengaruhi kedua-dua sikap dan niat pembelian. Ciri-ciri harga pula mempunyai kesan yang signifikan terhadap niat pembelian dan tidak signifikan kepada sikap terhadap keropok rumpai laut. Ciri-ciri lain iaitu jenama, pembungkusan, dan tekstur mempunyai kesan yang signifikan terhadap sikap, bagaimanapun, kesan ini tidak signifikan terhadap niat pembelian. Kedua-dua ciri warna dan perisa tiruan tidak mempunyai signifikan dengan sikap terhadap keropok rumpai laut dan niat pembelian. Hasil kajian mencadangkan agar pengilang atau penyelidik perlu member focus terhadap ciri-ciri bahan-bahan untuk memenuhi jangkaan pengguna. Kajian ini juga termasuk batasan kajian dan cadangan kepada penyelidik akan datang.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the Study

In Malaysia, benthic macroalga or seaweed is fairly rich but most are under-utilized with knowing their health benefits. Seaweeds can be a very attractive natural source of new compounds with biological activity (Matanjun, Chan, Ismail, Kassim, Chan, Tan, 2011). Processed edible seaweeds contains bioactive antioxidants, soluble dietary fibers, proteins, minerals, vitamins, phytochemicals, and polyunsaturated fatty acids (Mohamed, Hashim, Abdul Rahman, 2012). According to Gomez-Ordenez, Jimenez-Escrig, Ruperez (2010) there are specific regulation in the consumption of seaweeds. Their research also stated the chemical composition and variations between species are required in order to get the authorization for human nutrition use.

By exposing to both light and oxygen, seaweed develops free radicals and strong oxidizing agents. Though, the absence of oxidative damage in the polyunsaturated fatty acids and the oxidation stability during storage imply that their cells do have antioxidative defense systems protection (Matanjun *et al.*, 2011). In the current researches, seaweeds shown as one of the prospective complementary medicine (Mohamed *et al.*, 2012). The research shows that red, brown and green seaweeds are rich in therapeutic properties for health and act as anticancer, antidiabetic, antiobesity, and much more.

In Western countries, Japan, China and Korea used seaweed as their food and as a raw material in the agar, carrageenan and alginates production (Sanchez-Machado, Lopez-Cervantes, Lopez-Hernandez, Paseiro-Losada, 2004). Apart from that, seaweed have been used as jam, wine, tea, cheese, soup and noodles (Ruperez, 2002) and in most Asian countries, seaweed is consumed widely. Since marine algae are rich source of dietary fibre, minerals, proteins and vitamins, a



recognized antioxidant activity would raise the human diet value when it is consumed as food supplements (Matanjun *et al.*, 2011). Country like France becomes the first European country to start a specific regulation pertaining to the use of seaweed in human consumption. Other country like Spain use seaweed as novel food and it has been included in their canned vegetables soup (Gomez-Ordenez, Jimenez-Escrig, Ruperez, 2010).

The School of Food Science and Nutrition, Universiti Malaysia Sabah, in collaborations with local institutions, has conducted studies on nutrient compositions, antioxidant activities and development of food products from Malaysian seaweeds. According to Matanjun (2012), seaweeds shown to be highly nutritive, demonstrate good antioxidant properties and exert a cardio-protective effect in rats fed high-cholesterol/high-fat diets. This research also stated the presence of high dietary fibre, omega-3 fatty acids and antioxidant compounds such as polyphenols, vitamin C,  $\alpha$ -tocopherol, carotenoids and selenium may probably contribute to the cholesterol-lowering and antioxidant efficacy of these seaweeds. Based on her findings, seaweeds are nutritionally valuable thus making them a potential health ingredient for development of functional foods. These seaweeds are nutritionally valuable and contain rich sources of natural antioxidants thus making them a potential health ingredient for use in human and animal nutrition (Matanjun *et al.*, 2011).

As the demand for seaweed as food and ingredients increased tremendously, research by Matanjun *et al.*, (2011), hence, this study using seaweed crackers product developed by School of Food Science and Nutrition, Universiti Malaysia Sabah was performed to examine the intrinsic and extrinsic attributes, the attitudes towards seaweed crackers attributes, and purchase intention. The seaweed crackers product is prepared from the puree and powder of the local red seaweed, *Eucheuma cottonii*. The formulation comprised of two groups, fresh seaweed blended into puree and, fresh seaweed dried by using oven and ground into powder. The ingredients used to produce the seaweed cracker were tapioca flour, seaweed puree or powder, salt, sugar, black pepper powder and monosodium glutamate (MSG) (Chong, 2007).

According to Mei-Fang (2008) individual food preference is a very difficult function of a multitude of influences. His research stated that when making food choice decisions, consumers will have more realistic concern in mind. These consist of sensory aspects of food such as flavour and quality beside the influence of non-food effects such as cognitive information, the physical environment, and social factors.

Choice of a consumers typically influenced by the product's taste, or the nutritional properties, rather than extrinsic cues like the brand or the packaging (Fornerino and d'Hauteville, 2010). A significant amount of research in consumer behavior has been devoted to examining what information cue(s) consumers use most often when evaluating products (Lee and Lou, 2011).

This is contradicted with Veale and Quester (2009); and Olsen, Menichelli, Meyer, Naes (2011) where in their research consumers do rely on both intrinsic and extrinsic seaweed crackers' attributes in order to form their perceptions of experienced or expected product. This is supported by Rijswijk and Frewer (2008) stated that in purchasing decisions, consumers are likely to obtain awareness from other product cues, either intrinsic such as colour, texture, and ingredients or extrinsic cues namely packaging, brand name, and price (Rijswijk and Frewer, 2008). Without the actual experience or in the difficulty to evaluate the product such wine and perfume, Olsen *et al.* (2011) believed that consumers evaluate quality of the product based on the extrinsic cues. Their research also mentioned that high involvement consumers emphasize on intrinsic cues while low involvement consumers are on extrinsic cues.

Based on the research done by the researchers above, it is, therefore, important for both intrinsic attributes and extrinsic attributes to be correlated to the other aspects of products and its appearance for consumer choice prospect or liking of food products (Menichelli, Olsen, Meyer, Naes 2012).

According to Menichelli *et al.* (2012) to investigate consumers' acceptance on the other aspects of products, product development is important. In addition, he stated that two types of attributes which is intrinsic and extrinsic are often types of attributes investigated for independent test. However, in some cases this can be insufficient. For example from his research, the difference in consumer choice probability depends on information about health benefits. Hence, it is crucial to have both intrinsic and extrinsic seaweed crackers' attributes to be investigated simultaneously.

On top of that, changes in attitudes and purchase intention are moved by various numbers of food scares and crises. This has become a major problem worldwide for public health. Besides, the increasing technological change especially in the genetic engineering and food industry do generating much controversy over its costs and benefits cause it to have negative attitude towards genetically modified food (Bctonaki, Polymeros, Tsakiridou, Mattas, 2006).

Based on that, this study will use seaweed crackers product developed by School of Food Science and Nutrition, Universiti Malaysia Sabah to evaluate the effect of intrinsic and extrinsic seaweed crackers' attributes as well as to know the attitude towards seaweed crackers attributes and consumers' purchase intention towards the product.

## 1.2 Problem Statement

For the time being, the seaweed crackers developed by School of Food Science and Nutrition, Universiti Malaysia Sabah have not been evaluated for the commercial value.

According to Espejel, Fandos Flavian (2009), the increasing competitiveness in the markets requires companies to generate competitive advantages. Based from the marketing perspective, competitive advantages can be achieved by having a long-term relationship with the customers. As a consequence of the competitive environment, there are several different approaches were used to measure the involvement of consumer in food products and several factors related to consumer attitudes towards food products without keeping exclusively to the consumer involvement.

As suggested by Espejel, Fandos, Flavian (2007), consumers' perception of product quality is influenced both by product's intrinsic attributes and extrinsic indicators. Therefore, both intrinsic and extrinsic attributes of the seaweed crackers will be evaluated in order to know the perception of the consumers towards the product.

Based on the seaweed product developed by School of Food Science and Nutrition, Universiti Malaysia Sabah, it seems that there is a need to study on how customers' perceived the product such as the price, brand name, packaging, colour, texture, ingredients and flavour, the attitude towards seaweed crackers attributes and purchase intention towards seaweed crackers produced by School of Food Science and Nutrition. Taking into that consideration, this study will examine on how this product attributes can influence attitude towards seaweed crackers attributes about seaweed crackers and also whether they will purchase it when the product be sell in the market.

### 1.3 Research Objectives

The specific objectives of this study are as follows: -

- a. To examine the relationship between perception towards seaweed crackers attributes and purchase intention of seaweed crackers.
- b. To examine the relationship between perception towards seaweed crackers attributes and attitude towards the seaweed crackers product.
- c. To examine the relationship between attitude towards seaweed crackers and purchase intention of seaweed crackers.
- d. To examine the mediating effect of attitude for seaweed crackers on the relationship between perception of seaweed crackers attributes and purchase intention.

### 1.4 Research Questions

The research questions this study addresses in line with above research objectives are as follows:

- a. Does consumer's perception towards seaweed crackers attributes have a positive relationship with purchase intention of seaweed crackers?
- b. Does consumer's perception towards seaweed crackers attributes have a positive relationship with attitude towards the seaweed crackers?
- c. Does attitude towards the seaweed crackers have a positive relationship with purchase intention?
- d. To what extent does an attitude mediate the relationship between consumer's perception towards seaweed crackers attribute and purchase intention of seaweed crackers?

## **1.5 Significance of the Study**

The findings of the study should benefit both academics and practitioners like food industry to understand the relationships between intrinsic and extrinsic attributes, attitude towards seaweed crackers attributes and purchase intention in the seaweed crackers products developed by School of Food Science and Nutrition.

The results from this study might reveal the intrinsic attributes (i.e. ingredients, colour, flavour, and texture) and extrinsic attributes (i.e. price, brand name, and packaging) of seaweed crackers whether to have significant influence on attitude towards seaweed crackers attributes and purchase intentions. On top of that, this information is useful for further refining of the seaweed crackers in order to meet the consumers' demand.

In the managerial implications, finding from this study might be beneficial to marketing practitioners especially those involved with crackers production and food industry. Marketers gain a better understanding of the important factors that contribute to the formation of attitude towards seaweed crackers attributes and purchase intention towards the product.

## **1.6 Scope of Study**

This study will focus on seaweed crackers product developed by School of Food Science and Nutrition, Universiti Malaysia Sabah. The relationship of both intrinsic and extrinsic seaweed crackers attributes were examined with attitude towards seaweed crackers attributes and purchase intention. The intrinsic attributes include ingredients, colour, flavour, and texture. While extrinsic attributes include price, brand names, and packaging. Apart from that, the attitude towards seaweed crackers attributes and purchase intention will be determined based on the intrinsic attributes and extrinsic attributes of the product.

## 1.7 Definitions of Terms

Definitions and description of terminologies used in the study are defined below.

- Seaweed:** Marine algae widely distributed in the ocean, occurring from the tide level to considerable depths, free-floating (planktonic) or anchored to the substratum (benthic), (U.S. National Library of Medicine, 2011).
- Crackers:** "*Keropok*" or cracker is a form of snack that is very popular among the communities in Malaysia. Cracker made from marine resources such as fish and prawns are widely consumed in the east coast of peninsular Malaysia and a few districts in the east coast of Sabah (pamphlet, School of Food Science and Nutrition, 2005).
- Attributes:** Attributes are the characteristics or features that an object may or may not have (Aliman and Othman, 2007).
- Intrinsic Attributes:** The physical aspects of a product such as colour, flavour, form and appearance (Espejel *et al.*, 2007).
- Colour:** Color is the interpretation by the human brain of a light signal coming from a sample (Zhang, 2007)
- Texture:** Texture is related to contrast, periodicity, coarseness, characteristics of tufts, and the others (Xu, 1992)
- Artificial Flavour:** An added flavor from the natural flavor which contains the flavoring constituents derived from a spice, fruit or fruit juice, vegetable or vegetable juice, edible yeast, or fermentation product thereof (Reineccius, 2002).

- Extrinsic Attributes:** Attributes that are not related to the physical part of the product such as brand name, stamp of quality, price, country of origin, store, packaging and production information (Espejel *et al.*, 2007).
- Price:** Price is often determined by the cost, with a margin being added to yield a profit or return on the investment. In marketing, price help to achieve the goals of the business, varying the price according to the level of demand and the willingness of the market to pay the price (Riley, 1995).
- Brand Names:** A deliberate expression of a corporate self; a for-public-consumption story which is supposed to convey the inner meanings and values of the corporation or product (Miriam and Lars, 2004).
- Packaging:** A container that is in direct contact with product itself, which holds, protects, preserves and identifies the product as well as facilitating handling and commercialization (Ampuero and Vila, 2006).
- Attitudes:** Attitude as a learned, implicit anticipatory response. Attitude also viewed as an unobservable response to an object that occurs prior to, or in the absence of, any overt response (Fishbein & Ajzen, 1975).
- Purchase Intention:** Purchase intention is a measure of customer loyalty (Ness, Brennan, Oughton, Ritson, Ruto, 2010).