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Developing a Pastry Product with Tropical Liquid Seaweed (*Eucheuma Cottonii*)

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ABSTRACT

Currently, our society lives under a deceptive apprehension of there being food abundance. Many humans are surrounded by using quick meals prosperous in calories and unsaturated fats, high powered advertising, and over-consumption. The mass market has truly emerged as accustomed to the expression of junk food to designate such offerings, yet this incredibly processed food is bumped off in giant amounts. This study aimed to develop a pastry product with tropical liquid seaweed (*Eucheuma Cottonii*). The participants chose lot 2 with 10 grams of tropical liquid seaweeds according to their impression and judgment of the product in terms of appearance, chose lot 2 with 10 grams according to the product's visual sensation, chose lot 1 with 5 grams according to the fineness and crunchiness of the product, chose lot 1 with 5 grams according to the degree of the flavor, terms of general acceptability the participants chose lot 1 with 5 grams as their preferred treatment and the ideal amount of tropical liquid seaweed in making pastry. Moreover, tropical liquid seaweed (*Eucheuma Cottonii*) is loaded with nutrients, especially different dietary fibers, and other nutrients. Furthermore, using tropical liquid seaweed in making white peanut cookies is ideal for the benefits of people in terms of health.

Keywords **—** Acceptability, product development, quasi-experimental, Bohol, Philippines

INTRODUCTION

Currently, our society lives under a deceptive apprehension of there being food abundance. Many humans are surrounded by using quick meals prosperous in calories and unsaturated fats, high powered advertising, and over-consumption. The mass market has truly emerged as accustomed to the expression of junk food to designate such offerings, yet this incredibly processed food is bumped off in giant amounts. The consequences for the consumption of these unhealthy foods were lack of vital nutrients, obesity, and ailments related to immoderate intake of sugars, i.e., diabetes and fat, i.e., arteriosclerosis, among others. It is worrying that the fast meal tendencies are being adopted, reputedly barring difficulty in growing countries as they grow to be more prosperous; therefore, rates of associated sickness are growing (Pereira, 2011).

The latest increasing demand for seaweed products, as food, fodder, fertilizer, and sources of medicinal drugs justify this investigation on the dietary composition of one of the most anti-oxidative tropical fit for human consumption species *Eucheuma Cottonii*. This data is quintessential in the search for extra healthful food sources from the sea for use in the human diet (Matanjun et al., 2009).

The cultivated tropical liquid seaweed, *E Cottonii* grows very swiftly in the pristine water and can be harvested every forty-five days for human use. It is abundantly cultivated in Southeast Asia, especially in the Philippines and the pacific islands (Namvar et al., 2012).

Tropical liquid seaweeds like *E Cottonii* are prosperous in bioactive antioxidants, soluble dietary fibers, proteins, minerals, vitamins, phytochemicals, and polyunsaturated fatty acids. Although previously the seaweeds had been solely used as gelling and thickening dealers in the food or pharmaceutical industries, recent researches have revealed they are plausible as complementary medicine. This form of seaweed has been shown to have therapeutic residences for health and disease management, such as anticancer, anti-obesity, antidiabetic, antihypertensive, antihyperlipidemic, antioxidant, anticoagulant, anti-inflammatory, immunomodulatory, antiestrogenic, thyroid-stimulating, neuroprotective, antiviral, antifungal, antibacterial and tissue recuperation properties. Active compounds encompass sulfated polysaccharides, phlorotannins, carotenoids (e.g., fucoxanthin), minerals, petides and sulfolipids, with confirmed gain against degenerative metabolic diseases (Mohamed, Hashim, & Rahman, 2012).

In the final, a long time consumer demand in the field of meal production has changed considerably. Consumers extra and greater accept as true with that food make contributions without delay to their fitness (Mollet & Rowland, 2002). Today foods are no longer meant only to fulfill hunger and to provide quintessential nutrients for human beings but additionally to stop nutrition-related diseases and improve the physical and mental well-being of the customer (Menrad, 2003; Roberfroid, 2000a)**.** In this regard, practical foods play a remarkable role. The growing demand for such foods can be defined through the growing price of healthcare; the steady make bigger in lifestyles expectancy, and the want of older people for an elevated fine of their later years (Siro et al., 2008; Roberfroid, 2000b).

Furthermore, meals acceptability is affected by means of many factors, which can also be related to the individual, the food, or the environment in which the food is consumed. Acceptability is a subjective measure based on hedonics (pleasure), which in flip is influenced via the sensory properties of the

food, previous exposure to it and subsequent expectations, contextual factors, an individual's culture, physiological status, and many different variables. The size of meal acceptance is rather complicated and depends on psychometrics (scales) and/or behavioral models (food-choice models). Thus, this study is carried out to look at foods' sensory acceptability of exclusive remedies of pastry flavored with tropical liquid seaweeds measured and understood using sensory evaluation.

OBJECTIVES OF THE STUDY

This study aimed to develop a pastry product with tropical liquid seaweed (*Eucheuma Cottonii*). Specifically, this finds out about sought to answer the: 1) Acceptability of white peanut cookies with tropical liquid seaweed in different sensory attributes; 2) Significant difference between and amongst the sensory attributes of developed peanut white cookies with tropical liquid seaweed, and 3) theoretical nutritional value of tropical liquid seaweed (*Eucheuma Cottonii*).

METHODOLOGY

Research Design

This study utilized an experimental method of research to develop pastry products with tropical liquid seaweed. The information is based on the basic procedures in terms of preparation and processing of the standard recipe.

Research Site

This study was conducted in BISU-Candijay campus, province of Bohol, Academic Year 2018-2019. The BISU-Candijay campus has 2,074 approximate total number of students enrolled in all programs and 70 teachings and 84 non-teaching staff employed in the said campus. The BISU-Candijay campus is located in the municipality of Candijay in the eastern part of Bohol situated near the sea and mountains. The town produced main products are seafood like tropical liquid seaweeds.

Respondents

This study used purposive sampling to test the products to selected participants in terms of appearance, color, texture, taste, and aroma. There are 10 BSHM students, 10 non-teaching staff, and 20 teaching staff, including the experts who evaluate and mark the sensory evaluation form indicating their opinion on the sample and treatments of the products presented.

Instrumentation

The researcher utilized the sensory evaluation form and tally sheet as the main instrument in data collection. The said instrument was made up of two parts, first attributes which are very much like, extremely like, moderately like, slightly like, average, slightly dislike, moderately dislike, very much dislike and extremely dislike and lastly the general acceptability to be rated by the participants by using the nine-point hedonic scale that composed of the description as mentioned above.

This study allowed the researcher to gather data on sensory evaluation through sensory evaluation sheet use. Since the study aims to formulate an acceptable pastry product, following sensory attributes are observed, like appearance, color, texture, taste, and aroma of the product—a total of three treatments used in this research. The amount of tropical liquid seaweeds are varied in the different treatments in four replications.

The data gathered reflected on the sensory evaluation sheet were tallied and computed to determine the mean average per attribute in four replications. The data gathered were subjected to further statistical analysis.

Treatment of Data

Weighted mean, Kruskal-wallis test, and Mann-whitney U test were used to summarize, analyse, and interpret the data.

RESULTS AND DISCUSSIONS

Table 1. Acceptability of Peanut White Cookies with Tropical Liquid Seaweed in Terms of Appearance

Appearance	Overall Mean	Description
LOT 1 (5g)	7.53	VML
LOT 2 (10g)	8.27	EL
LOT 3 (15g)	8.02	VML

Table 1 showed that the evaluation on the appearance of lot 2 with 10 grams of tropical liquid seaweeds got the highest overall mean of 8.27 with the description of Extremely Liked; followed by lot 3 with 15 grams of tropical liquid seaweeds got an overall mean of 8.02 with the description Very Much Liked, and lot 1 with 5 grams of tropical liquid seaweeds got the lowest mean of 7.53 with the description of Very Much Liked.

It showed that the participant chooses lot 2 with 10 grams of edible tropical seaweeds according to their impression and judgment of the product in terms of appearance.

Table 2. Acceptability of Peanut White Cookies with Tropical Liquid Seaweed in Terms of Color

Color	Overall Mean	Description
LOT 1 (5g)	7.98	VML
LOT 2 (10g)	8.24	EL
LOT 3 (15g)	7.92	VML

Table 2 implied that the color of lot 2 with 10 grams of tropical liquid seaweeds got the highest overall mean of 8.24 with the description of Extremely Liked; followed by lot 1 with 5 grams of tropical liquid seaweeds got an overall mean of 7.98 with the description of Very Much Liked, and lot 3 with 15 grams of tropical liquid seaweeds got the lowest mean of 7.92 with the description of Very Much Liked.

This means that the participants choose lot 2 with 10 grams of tropical liquid seaweeds according to the product's visual sensation as they are tested and rated.

Table 3. Acceptability of Peanut white cookies with Tropical liquid seaweed in Terms of Texture

Texture	Overall Mean	Description
LOT 1 (5g)	7.99	VML
LOT 2 (10g)	7.97	VML
LOT 3 (15g)	7.54	VML

In table 3, it connotes that the texture of lot 1 with 5 grams of tropical liquid seaweeds got the highest overall mean of 7.99 with the description of Very Much Liked; followed by lot 2 with 10 grams of tropical liquid seaweeds, with an overall mean of 7.97, with the description of Very Much Liked; and lot 3 with 15 grams of tropical liquid seaweeds got the lowest mean of 7.54 with the description of Very Much Liked.

This drives to show that the participants chose lot 1 with 5 grams of tropical liquid seaweeds according to the fineness and crunchiness of the product tasted.

Table 4. Acceptability of Peanut White Cookies with Tropical Liquid Seaweed in Terms of Taste

Taste	Overall Mean	Description
LOT 1 (5g)	8.42	EL
LOT 2 (10g)	8.21	EL
LOT 3 (15g)	7.46	VML

Table 4 displayed that the taste of lot 1 with 5 grams of tropical liquid seaweeds got the highest overall mean of 8.42, with the description of Extremely Liked; followed by lot 2 with 10 grams of tropical liquid seaweeds, an overall mean of 8.21 with the description of Extremely Liked; and lot 3 with 15 grams of tropical liquid seaweeds got the lowest mean of 7.46 with the description of Very Much Liked.

This means that the participants chose lot 1 with 5 grams of tropical liquid seaweeds with the description Extremely Liked according to the degree of the flavor of the product tasted.

Table 5. Acceptability of Peanut White Cookies with Tropical Liquid Seaweed in Terms of Aroma

Aroma	Overall Mean	Description
LOT 1 (5g)	8.42	EL
LOT 2 (10g)	8.47	EL
LOT 3 (15g)	7.89	VML

Table 5 indicated that the last attribute which is the aroma, lot 2 with 10 grams of tropical liquid seaweeds has the highest overall mean of 8.47, description of Extremely Liked; followed by lot 1 with 5 grams of tropical liquid seaweeds, an overall mean of 8.42, description of Extremely Liked; and lot 3 with 15 grams of tropical liquid seaweeds, mean of 7.89 with the description of Very Much Liked.

This goes to express that the participants chose lot 2 with 10 grams of tropical liquid seaweeds according to the pleasant smell that came from the product tasted.

Table 6. General Acceptability of Peanut White Cookies with Tropical Liquid Seaweed

General Acceptability	Overall Mean	Description
LOT 1 (5g)	8.42	EL
LOT 2 (10g)	8.47	EL
LOT 3 (15g)	7.89	VML

In table 6 it showed that the general acceptability of lot 1 with 5 grams of tropical liquid seaweeds has the highest overall mean of 8.61, with the description of Extremely Liked; lot 2 with 10 grams of tropical liquid seaweeds, overall mean of 8.33, with the description of Extremely Liked; and the lowest which is lot 3 with 5 grams of tropical liquid seaweeds, overall mean of 7.48, with Very Much Liked description.

It showed that in terms of general acceptability, the participants chose lot 1 with 5 grams of tropical liquid seaweed as their preferred treatment and the ideal amount of tropical liquid seaweed in making pastry.

Table 7. Nutritional Value of Tropical Liquid Seaweed (*Eucheuma Cottonii*) based on Dry Weight (DW)

Nutrients	% Content
Ash	46.19
Soluble fiber	18.25
Protein	9.76
Iodine	9.42
Insoluble fiber	6.80
Crude fiber	5.91
Zinc	4.30
Iron	2.61
Lipid	1.10
Selenium	.59
Sodium	.15
Copper	.03

Source: Springer Science

Table 7 shows that tropical liquid seaweed (*Eucheuma Cottonii*) is loaded with nutrients, especially different dietary fibers, and other nutrients.

However, using tropical liquid seaweed in making white peanut cookies is ideal for the benefits of people in terms of health.

CONCLUSION

It is concluded that in developing a pastry product, the most acceptable treatment is lot 2 with the amount of 10 grams of tropical liquid seaweeds being most acceptable by the participants except for the attributes of texture and taste.

On the other hand, there are insignificant mean differences between and among the sensory attributes in developing white peanut cookies with tropical liquid seaweeds except for the attributes of taste.

Thus, the treatment using 10 grams of tropical liquid seaweeds was the highest rank in terms of the participant's preference. Lot 2, with 10 grams of tropical liquid seaweeds, is the ideal amount in making quality and healthy peanut white cookies.

TRANSLATIONAL RESEARCH

The findings of the study may be best translated to the various food production company. The results must be forwarded to the department of food and drugs and the department of health to improve the procedures in food processing and to strengthen the implementation of adding the tropical liquid seaweed to pastry or any food products for the additional unique food taste with health benefits.

RECOMMENDATION

Based on the findings, the following recommendations were formulated: Tropical liquid seaweeds can be used as additional ingredients in making peanut white cookies pastry, making use of proposed standard recipe of peanut white cookies with 10 grams of tropical liquid seaweeds is ideal and highly recommended. And to emphasize the uniqueness of the peanut white cookies with seaweed, it is recommended to enhance the appearance, color, texture, and aroma to help the future consumers to easily recognize that the white peanut cookies are added with seaweed.

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