

ULAM COOKIES

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Highlights: The aim of this project is to create and introduced the cookies that made of traditional vegetables or known as ulam as the natural flavouring. Ulam is the traditional vegetables which are normally consumed in a raw form among South East Asian populations. Ulam are rich in carbohydrates, proteins, minerals, and vitamins. In Malaysia ulam are popular and they are considered the most economical vegetables available throughout the year. However, their application in processed foods for enhancement of nutritional characteristics are still limited. Knowing bakery products such as cookies are the better vehicles for fortification. Therefore, this project was carried out to (1) produce healthy cookies made of ulam, (2) proposed a suitable formulation for the ulam into cookies by considering at the texture and taste, (3) introduce the cookies that made from ulam into the local market.

Keywords: *Ulam, Cookies*

Introduction

The amazing healing power of Malaysian herbs is often overlooked. Many of us would by-pass the *ulam* section at a buffet and miss out on the natural healing powers of these unassuming local herbs. Ulam are rich in carbohydrates, proteins, minerals, and vitamins. Normally *ulam* is consumed in a raw form among South East Asian populations such as in Indonesia, Thailand, and Malaysia and it is also eaten together with rice and another accompaniment such as *budu*, *cincaok* or *sambal* (Huda-Faujan et al. 2007; Reihani & Azhar 2012). On average, Malaysian adults consumed 40 g/person/day of ulam and it tends to increase the serum of Vitamin C, E, folic acid, β -carotene, and lycopene (Nurul Izzah et al. 2012). However according to National Health & Morbidity Survey by the Ministry Health Malaysia (MOH) (2015) reported that, 94% of the population in this country do not take vegetables in sufficient quantities, based on recommendations by World Health Organization (WHO). Nevertheless, Lembaga Pemasaran Pertanian (FAMA) through their campaign *Lebihkan Makan Ulam* has encourage more people especially young generation to consume ulam in their daily life (Sinar Harian 29 Jun 2020).

Ulam Cookies

Cookies have become one of the most desirable snacks for both young and elderly people due to reasonably cheap cost, more convenience, long shelf-life, and ability to serve as a vehicle for important nutrients. Usually, the main ingredients for making cookies are wheat flour, fat, sugar, water, while other ingredients such as milk, salt, aerating agent, emulsifier, colour, and flavour can be included (Jeantet, Croguennec, Schuck & Brulé 2016). Since consumers are much more concerned about their health and demand the food products conferring health benefits, they tend to look for the products that are more natural-like (Amin, Bashir, Dar & Naik, 2016). It is scientifically show that, *ulam* has potential as food that could bring health benefits to the consumer (You, Shahr, Haron & Yahya 2018). Within Asian countries, more than 120 species of ulam have been discovered, and it is including *Ulam raja* (*Cosmos caudatus*), *Pegaga*, (*Centella asiatica*), *Kacang botol* (*Psophocarpus tetragonolobus*), *Pucuk gajus* (*Anacardium occidentale L.*) and many more. For this project these four types of ulam has been chosen as the additional ingredients for making cookies.

Figure 1.1: *Cosmos caudatus*



Cosmos caudatus or *ulam raja* originated from Latin America but can be found growing wild around Malaysia. They can grow to a height of 2 meters from seeds found in the dried flowers. The part of the plant that is normally eaten is the young shoots. The health benefits of eating *ulam raja* are that is said to clean the blood of toxic materials and can also strengthen bones (You, Haron, Shahar & Yahya 2018)

Figure 1.2: *Centella asiatica*



Centella asiatica or *pegaga* grows in relatively moist soil. It originated from India but can easily be found anywhere in South East Asia. It is rebuilding the energy, helps to reduce stress and increase mental power. It is said be able to reduce high blood pressure, slow down ageing process, and help the body protect itself against toxins (You, Haron, Shahar & Yahya 2018)

Figure 1.3: *Psophocarpus tetragonolobus*



Psophocarpus tetragonolobus or known as *kacang botol* are a complete package. Its leaves, stems, flowers, seeds, tubers, are all edible in some way or the other. This veggie is packed with nutrition and offers us a number of benefits. This *ulam* are rich source of protein, vitamins A and minerals. The high dose of antioxidant present in this bean ensures that the skin maintains its elasticity and keeps it looking young (You, Haron, Shahar & Yahya 2018).

Figure 1.4: *Anacardium occidentale L.*



Anacardium occidentale L. or *pucuk gajus* is an evergreen tree that is native to North Eastern Brazil and is sophisticated in various tropical countries. The tree produces edible fruits with nuts which are widely consumed as a food. It belongs to Anacardiaceae family (You, Haron, Shahar & Yahya 2018).

Methodology

This project involves the lab test, it is necessary to see the various effects on each ingredient until get the right formulation. Therefore, sensory evaluation is needed each time of the lab test. This project is using the hedonic rating scales from range 1 to 5, dislike extremely to like extremely. In this project *ulam* is the additional ingredients in these making *ulam* cookies. It is undergoing the drying process in the oven at 140°C for 20 minutes.

Product Formulation of *Ulam* Cookies

The basic formulation (Table 1.1) was modified from brown sugar, butter, eggs, vanilla extract, salt, baking soda, flour and 11.4% (100gm) dried mix *ulam*. These formulations were modified to obtain the taste and texture to suit the developed product.

Table 1.1: Formulation of *ulam* cookies

	QUANTITY	PERCENT
Brown sugar	250 gm	28.4%
Butter	100gm	11.4%
Eggs	100 gm	11.4%
Vanila extract	10 gm	1.14%
Salt	10 gm	1.14%
Baking soda	10 gm	1.14%
Flour	300 gm	34%
Ulam Mix	100 gm	11.4%
Batch size	880 gm	100%

Techniques and Process of Making *Ulam* Cookies




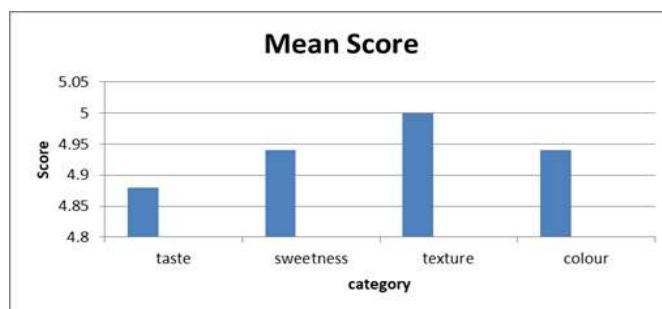
	<ul style="list-style-type: none"> • Weight the <i>ulam</i> into 500gm each of them. • Slices them and wash thoroughly the running water. • Place the <i>ulam</i> in the food dehydrator 70°C for 12 hours. • After it completely dry, grind it into a mixture.
	<ul style="list-style-type: none"> • Measure all the ingredients. • Beat the butter and sugar, add in the eggs, then add in the flour and <i>ulam</i> mixture. And mix until well combined.
	<ul style="list-style-type: none"> • Preheat the oven to 180°C for 5 minutes. • Spray the baking try with the cooking spray. • Drop the cookies dough on the baking try 10gm each. • Baked the dough for 20 minutes or until it is golden brown. • Transfer the cookies into cooling rack for cooling process.

Table 1.2 : Hedonic Rating Scales

Product Sample	Ratings				
	1 Dislike extremely	2 Dislike Moderately	3 Neutral	4 Like Moderately	5 Like extremely
Taste	0	1	6	5	5
Sweetness	0	0	1	13	3
Texture (Crunchiness)	0	0	3	8	4
Colour	0	2	7	4	4

From the mean score for the third result show the highest mean for the taste, sweetness, texture (crunchiness) and colour of the *ulam* cookies. Whereby all 17 respondents were accepted the taste, sweetness, texture, and colour of the *ulam* cookies.

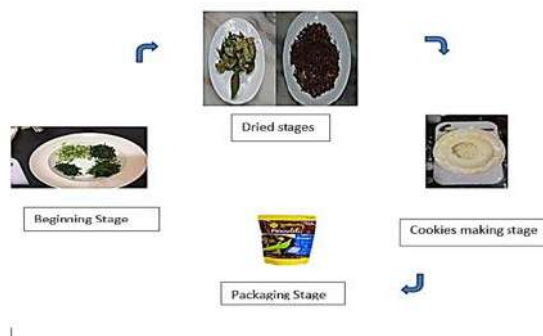
Figure 1.5: Mean scores graph for of *ulam* cookies


Based on the Figure 1.5 shows that the mean scores by respondents of *ulam* cookies. The mean for texture is 5.0, it show that most of the respondent like the texture of the cookies with, meanwhile the mean for sweetness and colour is 4.94, it show that, the respondent can accept the sweetness and the colour of the *ulam* cookies. Lastly mean score for the taste is 4.88 it shows that respondents are less likely the taste of the cookies.

Product Flow

This section shown the product flow from the first stage until the final stage. It involved four stages; the first stage is called beginning stage. During this stage the ingredients are go through selected procedure and cleaning process. Only the good quality of *ulam* are been selected during this stage. The core reason is to avoid unexpected effect to the product. Second stage is drying It involved all types of *ulam-ulam* by using food dehydrator machine at 70°C for 12 hours. The third stages are cookies making, whereby all the ingredients are measure, and mix into the cookie's dough. The last stage is packaging, the cookies is measured into 100gm for each of the packaging.

Figure1.6 : Production Flow



Conclusion

The use of the dried *ulam* as the natural flavouring in cookies production improve the properties of the cookies itself. Whereby most of the respondent can accept the texture, taste, colour, and sweetness of this cookies. The products may very well serve the functional food industry.

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