

# DEVELOPMENT FORMULATION FOR NUGGET BANANA BLOSSOM

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## ABSTRACT

The aim of this work is to produce nugget from banana blossom. Three formulations were developed and undergoes hedonic and sensory test. The sample was coded using three different code. There are 30 panellist students from Food Technology Department randomly tested the three different formulation of nugget banana blossom. The criteria for hedonic and scoring test were colour, texture, aroma taste and overall acceptance. Data collected was analysis using application SPSS 17.0 using analysis variance and ANOVA test. Formulation 3 contains 65% banana blossom was chosen as the best formulation based on the using application SPSS 17.0 using analysis variance and ANOVA test

Keywords: nugget, banana blossom, hedonic and scoring test

## 1. INTRODUCTION

Agriculture sector plays an important role of economy in Malaysia, especially for tropical fruit crop such as papayas, bananas, guava, pineapple and so on. Banana (*Musa sp*) plant belonging to the genus of *Musa* from the family of *musaceae* is a plant that grows widely in Malaysia. It can grow 2 to 4 meters in height at maturity. The flower of the banana tree is one of the most popular of people living in countries such as Malaysia, Philippines, Indonesia and Sri Lanka. It is usually red or purple red in colour and attach to the end of banana fruit bunch. In the red or putple red bracts, lots of small whitish flowers, which turn into mature edible banana fruit could be found (Marikkar *et al.*, 2016). The by-product of banana shrubs especially blossom is usually thrown away by producer in plantation and produce many of post-harvest waste. (Awedem., *et al* 2015).

Each time one banana stem is produced, one banana blossom is produced because it is usually harvested together with the banana. These banana blossom are usually thrown away by producer in plantations. This by-product can be reuse as potentially good source to make new food product. (Awedem., *et al* 2015). By-product of vegetable and plants are usually discarded post-harvesting or processing and it needed researcher or manufacture come out the new idea to produce new innovative potential nutritive food product for consumer in the market.

## 2. LITERATURE REVIEW

Banana and plantain are one of the most important sources of energy abundantly in diet of people living in tropical humid region. The plants are stenothermic, cultivated in hot and wet regions and bear fruits all year round. There are approximately 1200 variety of banana all over the world. (Awedem., *et al* 2015).

According to the Darvari *et al* (2010), based on the consumption pattern of people, banana has been ranked as the fourth most important fruit crop in Malaysia. Banana blossom is usually considered as a by-product of banana cultivation. These bananas are the third most consumed food (Dury *et al.*, 2002). It is consumed same as other vegetable either eaten raw or cooked in Asian region. Instead of being treated as an agriculture waste, banana blossom can be utilized as an ingredient in food formulations.

Over the years, several studies have been conducted on different aspect of Malaysian banana plant. Zhan, W. S *et al* (2011) reported that banana flower is rich in antioxidant compound in their study and evaluate the antioxidant activity of banana flowers extract at two typical cultivars grown in Hainan China. According to Divya *et al.*, (2016), the banana blossom has been used in traditional medicine to treat bronchitis, constipation and ulcer problem. Divya *et al.*, 2016 also reported in their study of in-vitro study is a preliminary evaluation of anti-inflammatory and anti-oxidant activities of *Musa paradisiaca* and provided scientific validation for the use of this plant in folk medicine.

Arya, K.S., and Sinija, V.R., (2016) reported that banana blossom has high nutritional value and antioxidant properties and can be used in died in the form of dehydrated flour and can be easily incorporated into food formulation. On another research, Awedem, *et al* (2015) reported that the banana blossom could be considered as a source of dietary fiber for the control of obesity and diabetes. They are also research of banana peel that have shown that banana peel are rich in unsaturated fatty acids, antioxidant and good quality protein (Happi Emaga *et al.*, 2007).



Source : Divya, R.S., *et al* (2016)

**FIGURE 1:** Banana Blossom

## 3. METHODOLOGY

Raw materials that are used are banana blossom (*Musa paradisiaca*) were collected from hypermarket around Kuantan Pahang.

Firstly, banana blossom was identified and authenticated before processing. The banana blossom were clean, outer bracts were removed and washed. Then, soaked the banana blossom with brine solution for 20 minutes. After that, banana blossom was steamed for 30 minutes. Grind banana blossom with other raw material by using food processor. The mixture is placed on the tray and inserted in to the freezer for 45 minutes. After that, shape the mixture using mould and coated with

bread crumb. Lastly, fry the nugget until it turn in brown yellowish colour. Three formulations are develop which the independent value is percent of banana blossom: F1: 75%, F2:70% and F3:65%.

#### 4. RESULT AND DISCUSSION

Data collected was analysis using application SPSS 17.0 using analysis variance and ANOVA test. Analysis of hedonic and hedonic measured and make conclusion for product. The sample is coded using different code. There are 30 panellist that involved randomly from student Food Technology Department, Polytechnic Sultan Haji Ahmad Shah Kuantan Pahang to analysis sensory nugget banana blossom. Panellist was from student food technology department to prevent bias for result analysis sensory. The factor that evaluate from sample is texture, aroma, taste, colour and overall acceptance.

The data is analysing and analysis using application SPSS 17.0, the analysis statistic using guidance which is mean and standard deviation. Analysis statistic such as analysis variance and ANOVA test. ANOVA or variance test use to know important in analysis evaluate mean in sample.

**TABLE 1 : HEDONIC TEST**

FORMULATION	COLOUR	TEXTURE	AROMA	TASTE	OVERALL ACCEPTANCE
1	2.77±1.233a	2.77±1.006a	3.13±1.106a	2.60±1.354a	2.63±0.964b
2	4.57±1.695b	5.80±0.847b	4.27±1.701b	6.27±0.944b	6.90±0.803c
3	2.63±0.999a	2.43±0.858a	2.53±0.937a	2.27±1.015a	1.37±0.556a

Means with different letter on the same row are statistically different (p<0.05).

**TABLE 2 : SCORING TEST**

FORMULATION	COLOUR	TEXTURE	AROMA	TASTE	OVERALL ACCEPTANCE
1	2.73±0.52083b	2.63±0.49013a	2.63±0.49013a	2.56±0.56832b	2.46±0.50742b
2	2.90±0.71197c	3.26±0.98027b	3.53±0.81913b	3.30±0.70221c	2.93±0.78492c
3	1.76±0.43018a	2.20±0.71438a	2.26±0.44978a	1.66±0.66089a	1.73±0.52083a

Means with different letter on the same row are statistically different (p<0.05).

In this study, nugget is produce mainly by using banana blossom. The main innovation is to replace totally protein in nugget with banana blossom. This will make the variety of nugget in industry. Usually, nugget in industry are made from meat, chicken and fish. There also mixed the nugget with vegetable such as carrot. Therefore this banana blossom nugget doesn't contain any meat and appropriate to vegetarian consumers.

From three formulations, the best formulation was chosen based on the sensory analysis that determine the specification of colour, texture, aroma, taste, and overall acceptance. Data was analysed using the SSPS17.0 application as shown at table 1 hedonic test and table 2 scoring test.

For overall in Hedonic test, it has 9 scale its start from 1 which is very like and 9 which is extremely dislike. From the value from panellist for overall acceptance the 1 are extremely like if the value more than 3 that's mean the panellist doesn't like the product. For scoring, it has 6 scales with 5 attributes. The attributes are colour, aroma, taste, texture and overall acceptance. The 1 value are extremely like and 6 are extremely dislike.

From table 1 hedonic test result, the colour, texture, aroma and taste show that formulation 1 and 3 is statically different with formulation 2. From the overall acceptance, the formulation 1, 2 and 3 is statically different each other. From the hedonic test result, the best formulation that the panellist choose are formulation 3.

From table 2 scoring test result, the colour of for formulation 1, 2 and three is statically different each other. Texture and aroma, formulation 1 and three is statically different with formulation 2. For taste and overall acceptance, formulation 1, 2 and 3 is statically different each other. From the scoring test result, the best formulation that the panellist choose are formulation 3.

## 5. CONCLUSION

As conclusion, this research is success to produce new innovative product which is nugget banana blossom without any source of meat, chicken or fish that can be accepted by people. Formulation 3 (65% banana blossom) is the best formulation for ingredient of nugget. In addition, this product is produced to increase the variety nuggets products in the market. This product can be one of the potential alternatives food to vegetarian.

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