

## **Sensory Study on Persea Americana Durability as Seed-Based Flour Innovation**

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**Abstract:** The avocado fruit, better known as *Persea Americana*, is a plant that has many nutrients such as protein, fat, vitamin A carbohydrates including its seeds. This study aimed to develop an avocado seed-based flour innovation product, evaluate based on sensory observations on the durability of avocado seed-based flour product innovation in terms of color, texture, odor and taste and identify suitability for packaging of avocado seed-based flour products. This study took 14 days to get the data to analyze. The study is based on observation and is recorded in a sensory research form that takes into account colors, textures, smells and flavors. As a result of the observations, there were changes in color, odor and taste while no changes in texture were noted. As a result of the research conducted, product development is well underway, and improvements need to be made so that innovative flour products can be marketed in the future.

**Keywords:** Avocado, Seed-Based Flour, Innovation Product

### **1. Introduction**

The development of the country towards a developed nation based on the vision of 2020 has changed the pattern of eating habits in line with the economic and cultural development of the country. Flour is a key ingredient often used in baking or biscuits. Wheat flour is made from dried grain processed and processed into a finely texture flour (Sidik, 2019).

Heart problems and diabetes are among the leading causes of death in the world due to dietary restriction (Sharifah Azizah et al., 2015). Avocado fruits contain no cholesterol or sodium and have low levels of saturated fat that are able to control the daily diet of humans. Avocados have high calorie values such as beans, bread, oats, and pasta which can help people with weight problems.

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Avocado contains high fat content as well as a special flavor and has a delicate flavor (Anova & Kamsina, 2013). Avocado also contains nutrients such as calcium 10mg, phosphorus 20mg, protein 0.9 grams, calorie count 85, vitamin A 180 IU, vitamin C 13mg and vitamin D 20 IU. An avocado also contains about 300 calories, 88% of fat that help regulate appetite. A good avocado should be cold and durable. Avocado is a seasonal fruit and can grow at high ranges and with varying rainfall averages (Rastini et al. 2017). Avocado also is a fruit plant that produces seasonal production based on average rainfall.

According to Kamsina et. al. (2013), damage to avocados is rapid depending on the method and storage temperature due to the composition of the oxygen content and surrounding air carbon dioxide. Long-term storage at room temperature makes avocado fruit durable and easily damaged. The processing of avocado seeds into flour also has high commercial value especially for those who care about health in their daily diet.

Avocado prices in Malaysia are slightly more expensive than in Indonesia, causing avocados to be less favorable in the production of various avocado products between Malaysian society. The production of intermediate avocados has been a problem as peak production has led to unstable avocado prices in the market (Anem, 2011). Unstable prices will affect small trades in the production of food industries especially in determining the cost of production and profitability of avocado produce.

Based on the research that has been conducted, the problem statement in the study is that some avocados can cause obesity or obesity due to high calories. In addition, the seasonal production of avocado causes the avocado to be less widely accepted by the Malaysian public. It is durable, and the perishable avocado fruit is one of the causes of commercial value. Seasonal produce also makes the price of an avocado in Malaysia expensive. In addition, the diversity of avocado products is also less developed because it is not very popular in Malaysia and the public prefers different imported fruits over the more commonly known avocado. Researchers have suggested that avocado seeds be one of the innovative products that replace wheat flour content in food products and that avocado seed-based flour innovation products will provide more avocado resistance and help those who practice healthy eating.

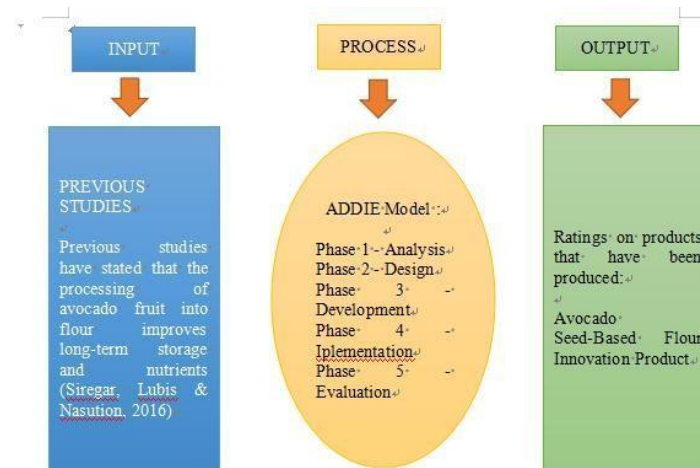
## 1.1 Objectives

The objectives of this project are:

- i. Develop an innovative flour product based on avocado seeds.
- ii. Reviews based on sensory observations on the durability of avocado seed-based flour product innovations in terms of colour, texture, odor and taste.
- iii. Identify the suitability of product packaging of avocado seed-based flour product innovations

## 1.2 Conceptual Framework

The purpose of the conceptual framework of this study is to facilitate the researcher to research the concepts involved in the study. The conceptual framework can also assist the researcher directly in developing research plans. The concept for the development of an avocado seed-based flour product innovation is divided into three parts: inputs, processes and outputs as described in figure 1 below.



**Figure 1: Conceptual framework**

### 1.3 Literature review

The avocado or scientifically known as *Persea Americana* comes from fruit plants from the Lauraceae that can be eaten as fresh or processed into another product (Anova, 2013). Since about 1519, avocado is said to have been known for centuries. It is considered an important fruit for food and nutrition. Avocado is not popular in ASEAN countries such as Malaysia and Thailand but popular in Philippines and Indonesia.

Avocado fruit is less popular in Malaysia due to its economic value and its potential with other crops such as banana, mango, durian and many local fruits. However, there are also avocado plants registered under the Department of Agriculture since 1953. A total of 11 species of avocado plants are cultivated in Malaysia but only 7 are registered in Malaysia (Anem, 2011). According to Anem (2011), avocados that are produced for commercialization should have a low temperature and durability and avocado seeds should be small in size and not interfere with the fruit during shipment, grading and handling after harvesting.

There have been several studies conducted by previous researchers on the innovation aspects of avocado seed-based donut flour production. According to Patricia et. Ig. (2016), avocado is a fruit that has high nutritional value and considered a major tropical fruit, as it is rich in protein and contains low fat-soluble vitamins in other fruits, including vitamins A and B and moderate levels of vitamin D and E. In addition, these fruits have been recognized for their health benefits, mainly due to the compounds found in lipid fractions, such as omega fatty acids, phytosterols, tocopherol and squalene.

## 2. Methodology

According to Shabita (2006), the study design is a plan that can show in more detail how a study is conducted. To conduct this study, researchers used the ADDIE model, as a design model and reference plan to develop the product. The ADDIE model is a product design model that is often the basis of other design models (Zulkifli, et al. 2018). According to Bacotang and Isa (2016), there are five (5) phases that have been used namely Analysis, Design, Development, Implementation, Evaluation.

### 2.1 Phase 1 - Analysis

For this project, the selection of the product design concept begins with the product design process to achieve the objective. The main function of the product is to produce flour products based on avocado seeds. The beginning of the idea process for avocado seed-based flour products is to gather all the

information regarding avocado, avocado seeds, their uses and issues with avocado seeds. This method aims to obtain information on the avocado that can be further processed including the seeds. Poor processing of fruit as well as avocado seeds led to less utilization of avocado fruit. It is also at this stage that researchers have identified the problem of avocado seed-based flour products, namely that avocado seeds are no longer used to produce a new product and are only discarded after consuming avocado.

## 2.2 Phase 2 - Product Design

In this phase the researcher has devised a strategy in product development. This step also outlines how to achieve product information and objectives. Among the elements in the design phase include specifying what to accomplish, analyzing, stating the objectives and choosing which method to use. The output in the design phase will be input to the development phase. Product design is made after taking into account the material suitability factor. The design process is taken into account by considering the type of design you want to create. The development of innovative products focused solely on avocado seeds. The avocado seeds will be taken to dry over a period of time and grind to a smooth finish.

## 2.3 Phase 3 - Development

Problem analysis is given to develop a product that can solve the problem. The purpose of this phase is to produce a project plan. During the development phase, the work steps are described in more detail. This raw material is used to develop and produce innovative products of avocado seed flour. This process of selecting raw materials is important to ensure that the product being produced is consistent and has a longer shelf life. The method used to make avocado seed-based flour is to dry the avocado seeds under hot sun until dry before turning them into flour. Experimental methods will be used by researchers in the production of avocado seed-based flour innovation products.

## 2.4 Phase 4 - Implementation

The development of the project will be carried out in accordance with the planned plans. The implementation involves the method of drying the sun and the process of grinding the flour into a product.

### i. The Benefits of Avocado Fruit Processing to Flour

The processing method used for avocado seeds is to dry thinly sliced avocado seeds. Once the avocado seeds have dried, the seeds should be thoroughly blended before filtering to separate the impurities. Then the flour is mixed into plastic for storage purposes.

### ii. Experimental Benefits of Product Production

For the selection of experimental methods of raw materials, researchers have used the sun drying method. The production procedure of this product is based on the experimental method that has been carried out.



**Figure 2: The avocado is cut into two pieces and the seeds are removed before the avocado seeds are washed clean.**



**Figure 3: Sliced avocado seeds should be dried under the heat of the sun. The best drying period is 3 to 5 days.**



**Figure 4: Avocado seed-based flour products from sun-dried methods after grinding**

### iii. Product Packaging Design

The product packaging design contains the product information you want to convey to the user. Some of the information on the packaging is the product name, product logo, and product label. Adequate information and unique traction is one way of convincing consumers of the product being produced.



**Figure 5: The logo on the packaging for Avocado seed-based Flour Innovation Product.**



**Figure 6: Product label on packaging for avocado seed-based flour innovation products.**



**Figure 7: Examples of the recommended form of packaging are window bags.**

### **3. Results dan Discussion**

The data analysis was carried out by the researcher by collecting data based on observations made on 14-day avocado seed-based flour innovation products. The analysis section presents in more detail the researcher's product innovation observations based on color, texture, odor and taste.

#### **3.1 Analysis of Sensory Assessment Aspects of Colour**

According to the researcher's observations, on the first day until the Fifth day there was no change in the avocado seed-based flour products produced by the researcher in which the product retains a yellowish colour. However, the changes took place on the sixth to tenth days where the colour of the flour began to turn light brown as the flour storage was often opened. On the eleventh day to the fourteenth day the avocado seed-based flour innovation products changed colour to brown.

#### **3.2 Analysis of Sensory Evaluation Aspects in Textures**

Based on the observations made by the researcher there was no texture change in the product from the first day until the fourteenth day. Innovative flour products based on avocado seeds have a delicate texture when touched. But it will feel a bit grainy when the product is dissolved in water.

#### **3.3 Analysis of Sensory Assessment Aspects in terms of Odor**

Based on the observations made by researchers on avocado seed-based flour innovation products, from the first to the fourth day there was no strong odor of avocado fruit. On the fifth to the ninth, however, the avocado seed-based flour innovation products began to produce a slightly stronger avocado aroma. On the tenth day until the fourteenth day the smell of the product was changed and became very strong to smell.

#### **3.4 Sensory Evaluation Aspect Analysis in terms of Taste**

Observational analysis researcher's, on the first day of every fifth day there is no change to the taste of the innovation of flour products based on the avocado seed which is products containing the bitter avocado fruit flavoring products. However, the taste changes can be felt on the product on the sixth and seventh days where the product starts to become slightly bitter and sticky. On the eighth to eleventh day the basic product of the avocado seed-based flour is studied to give the tongue a sticky taste. From the twelfth to the fourteenth days, the taste of the product changed to sticky and bland.

#### **3.5 Implication**

This discussion is also based on the form of observation on the product that researchers need to improve. While the conclusions are based on the results of the study that have been analyzed through the observation form for 14 days. Researchers have experimented with data analysis methods. Researchers only use avocado seeds to make flour for the development of innovative products.

Based on the research conducted by the researcher, there are several suggestions that can be considered for product improvement in the future. The improvement includes product development and packaging after observation. Some suggestions for improvement:

- i. Selection of effective preparation methods and methods to make the product more durable.
- ii. Diversify innovation products based on avocado seed-based flour.
- iii. Review the methods or methods for providing sensory assessments that are acceptable to the user.
- iv. Study and analyze the production of a form of packaging that is of interest to consumers.

#### 4. Conclusion

Overall, the research has been successful in achieving the objectives set by the researcher. This study has shown changes in sensory evaluation in terms of colour, smell and taste while no change in texture. In conclusion, Researchers are pleased with the development of avocado seed-based flour product development studies as it achieves the research objective. It is hoped that this avocado seed-based innovation product will gain a place in Malaysia in the future to open up the public on avocado fruit consumption.

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#### References

- Anova, I. T., & Kamsina, K. (2013). Efek Perbedaan Jenis Alpukat dan Gula Terhadap Mutu Selai Buah. *Jurnal Litbang Industri*, 3(2), 91-99.
- Arackal, J. J., & Parameshwari, S. (2017). HEALTH BENEFITS AND USES OF AVOCADO. *Review Article* 6(17), 392-399.
- Bergh, B. (1992). The avocado and human nutrition. I. Some human health aspects of the avocado. In *Proc. of Second World Avocado Congress* (pp. 25-35).
- Chandra, A., & Ingrid, M. (2013). Pengaruh pH dan jenis pelarut pada perolehan dan karakterisasi pati dari biji alpukat.
- Duarte, P. F. Chaves, M. A., Borges, C. D., & Mendonça, C., C. R. B. (2016). Avocado: characteristics, health benefits and uses. *Ciência Rural*, 46(4), 747-754.
- Malangngi, L., Sangi, M., & Paendong, J. (2012). Penentuan kandungan Tannin dan uji aktivitas antioksidan Ekstrak biji buah alpukat (*Persea Americana* Mill.). *Jurnal MIPA*, 1(1), 5-10.
- Wardani, Y. A. K. (2014). Potential of Avocado (*Persea americana* mill) to Reduce Coronary Heart Disease Risk. *Jurnal Agromedicine*, 1(1)-60.