Filler Material Concentration and Characteristics of Fruit Sucrose Concentration Leather Jackfruit (Artocarpus champeden Lour)

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Abstract: Influence of the addition of corn starch and sucrose concentration on Characteristics Fruit Leather Cempedak. The benefits of this research is to extend the shelf life of jack fruit, diversification of foodstuffs that are expected to increase the economic value and the quality of fruit jack fruit leather Cempedak. The experimental design used in this study is. Group Random Design (RAK) with 2 factorial is the addition of maize starch (a) and the addition of sucrose (b) consisting of 9 combination with 3 repetition. This research procedure includes washing, peeling and cleaning, crushing, molding and drying. The results showed that the addition of corn starch and sucrose concentration affects the real level of total sugar content, and vitamin C. In the organoleptic test on taste and aroma showed a noticeable difference. The results of the analysis of organoleptic analysis test for color, and texture turnsfruit leather Cempedak with treatment a1b2 (1% corn starch and sucrose 20%) favored panelists.

Keywords: Filler, sucrose, fruit leather, jackfruit.

1. Introduction

Plant jackfruit (Artocarpus champeden Spreng) is a plant that grows in many tropical Indonesia. This jack fruit plants annually and is a seasonal fruit. In the rainy season, especially in the months of November to February, the jack is most prevalent, and vice versa. Things like that among other causes Cempedak fame among the people in Indonesia is still less than jackfruit.
People are more familiar with jackfruit than jack, but the jack has specialty. Fruit flavor is very sweet and sticky, also very fragrant aroma and distinctive, which is a mixture of durian aroma, kemang, and jackfruit. Cempedak have sufficient nutrition complete, the price is affordable by the community. Besides the fruit, jackfruit almost all parts of the plant can be utilized.

In everyday life Cempedak consumed in fresh condition not as a basic ingredient of a food product. Processing of the jack fruit flesh do to extend the value of savings and a diversification of products, thus broadening the use and marketing. One alternative to the use that is making Fruit Leather jackfruit, Widyastuti [1].

Disadvantages of jack fruit are very rare, especially jack fruit included in the seasonal fruit, and the price is pretty expensive, while the excess of jack fruit itself is to have a very high fiber content. In this study the jack will be processed into fruit leather.

Leather products made from fruits or vegetables were destroyed and the pieces or thin sheets that have a distinctive consistency and can last for months. Fruits that can be made of fruit leather is to have a sufficient level of maturity, low moisture content, high-fiber, and contain enough sugar, Ernie [2].

The problem that arises is to determine the type of filler used and the concentration of fillers and also the concentration of sucrose to be added to the fruit leather products Cempedak.

This is because each filler has a coefficient of effectiveness vary, which will also affect the process of drying fruit leather jack, which if temperature drying is high, it will cause the fruit leather into a browning or brown in color caused by the decomposition of reducing sugar and amino acid group during the process of drying or heating.

2. MATERIALS AND METHODS
2.1. material
The materials used in the manufacture of leather jack fruit is ripe jackfruit local varieties or old shows yellowish color red fruit, the fragrance is very sharp, and when hit with a knife will be ringing. Additional materials used is gelatin, gum arabic, corn starch, citric acid, sucrose, glucose.

2.2. Research Methods
The study is divided into two stages, namely Research Introduction and Key Research.

2.2.1 Research Introduction
The preliminary research is research analysis of raw materials consisting of the analysis of water content and fiber, as well as the choice of filler materials are best used on fruit leather jack that is comprised of gelatin 1%, starch cornstarch 2%, gum arabic 3% . To obtain the best type of filler material then tested for organoleptic taste, color, texture and aroma.

2.2.2 Primary Research
a. Draft Treatment
The design of treatment used in the primary research is the first factor concentration of filler (A), which consists of three levels, namely 1% (a1), 2% (a2), and 3% (a3) and the second factor was the influence of the concentration of sucrose (B) which consists of three levels, namely 15% (b1), 20% (b2), and 25% (b3).

b. Design of Experiments
The experimental design used in this study is a 3x3 factorial design in a randomized block design (RBD) with three replications consisting of two factors.

c. Draft Response
The draft response that is used is the chemical response analysis of water content by gravimetric method, Anton [3], the levels of reducing sugars by the method of Luff Schroll, the fiber content Method with gravimetric, total acid with Method titration, and the analysis of Vitamin C with Method DFIF, and response organoleptic characteristics of the fruit leather jack (color, flavor, aroma, texture) [3]. Rate organoleptic test was conducted by 15 panelists. Organoleptic test was conducted to determine the level of preference or acceptance of fruit leather products Cempedak. The criteria used by the panel
in conducting the research are: (1) do not like, (2) Somewhat like, (3) normal, (4) somewhat favored, and (5) Preferably, the assessment results entered into the form filling, then processed statistically.

3. RESULTS AND DISCUSSION
3.1 Research
3.1.1 Analysis of Raw Materials

<p>| Table 1. Analysis of Chemical Raw Materials Cempedak |
|----------------|----------------|</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Composition</th>
<th>Nutrient content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water content</td>
<td>76.24</td>
</tr>
<tr>
<td>2</td>
<td>Fiber Content</td>
<td>2.30</td>
</tr>
</tbody>
</table>

The water content is obtained from the chemical analysis of the preliminary study amounted to 76.24%, whereas the results obtained on Fruit Leather tomato tomato water content of 96.11%, Linda [5]. This suggests that the raw material jackfruit is one fruit that has a water content that is not too high. This is in accordance with one of the conditions of making good fruit leather as wet semi food product such as Fruit leather is said to be better when it has a water content of less.

Cempedak fiber content obtained from the chemical in the preliminary study was 2.31%, while the results of research on Fruit Leather Strawberry 0.9%, Maya [6] and durian fiber content of 1.2% [6]. This suggests that the raw material Cempedak accordance with one of the conditions of making fruit leather as wet semi food product such as Fruit leather is said to be better to have more fiber content.

3.1.2 Test Appearance

In the manufacture of leather jack Fruit added excipients are gelatin, corn starch, and Gum Arabic. The addition of fillers to the fruits to be dried is intended to facilitate the drying process. In addition, one function of the filler is to improve the texture and appearance at Fruit leather jack. Preliminary results of the organoleptic based panelist obtained two types of fillers are best used gelatin and maize starch, the researchers took the corn starch filler material because the price is very economical.

In the preliminary study results obtained from the type and concentration of filler is best that maize starch with the addition of a concentration of 2% this is because in the maize starch are amylose and amylopectin which can cause a hard film layer on a fruit leather products

3.2 Primary Research
3.2.1 Water Content

Water is an important component in food ingredients, since water can affect the appearance, texture and taste of food, with a holding capacity varying at each other foodstuffs, Winarno [8]. The water content in food ingredients can affect the durability of food against microorganisms that are expressed in a water activity (Aw), the amount of free water that is used by microbes for growth, where the higher the water content contained in the food, the more quickly damaged by activity microorganisms.

By knowing the water content in a foodstuff, it can be used as a benchmark to determine the standard quality of these materials. [2] suggests that the requirements moisture content in the manufacture of fruit leather to 10-15%. Meanwhile, according to the opinion, Desroiser [7], a large number of fruit sold as dried fruit with a moisture content of 15-25%.

In Figure 2 is shown that the treatment concentration of fillers and sucrose did not give a real effect, this is due to filler is granular corn starch consists of two kinds of fractions, namely amylose and amylopectin with a ratio of 20% amylose and 80% amylopectin, where both factions these can be separated with hot water, Kentz [9].
Starch granules when inserted into the cold water then the starch granules absorb water and swell. However, the amount of water absorbed and limited swelling. The absorbed water can only reach the level of 30%. Increasing the volume of starch granules which occur in water at temperatures between 55 ° C to 60 ° C is a real swelling, and after this swelling starch granules can be returned in its original condition.

The greater the concentration of filler material, the smaller the water content is obtained. This is because the corn starch is a food that has a hydro-colloid properties (like water) where maize starch can swell up to 10 times the original weight if it is in the water [8].

The higher concentration of sucrose and lower concentrations of cornstarch obtained the water content tends to be low. According, Buckle, et al [10] stated that the sucrose has the ability to bind water, where the higher the sucrose, the more water that can be bound.

Sucrose is an oligosaccharide that is a polymer with a degree of polymerization of 2 to 10 and usually is soluble in water, so-called because it consists of a disaccharide of glucose and fructose molecules. The bond between two monosaccharide molecules called glycosidic bond. This bond is formed between hydroxyl groups of atoms C no. 1 which is also called the anomeric carbon atom with hydroxyl groups on the sugar molecule C on the other. Glycosidic bonds typically occur between atoms C no.1 to no.4 C atoms by removing one mole of water. With the increasing amount of sucrose then the amount of water released from the glycosidic bond increased [8].

![Figure 2. Histogram Effect Concentration Fillers and Sucrose Concentration Against Moisture Fruit Leather Products Cempedak](image)

### 3.2.2 Total Sugar Levels

Sugar is widely used in the preservation of fruits, vegetables, and manufacture of a variety of food products. Some food products high in sugar content tend to be damaged by yeasts and molds the group of microorganisms that are relatively easily damaged by heat [10].

<table>
<thead>
<tr>
<th>The concentration of sucrose</th>
<th>Total sugar content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>b1 (15%)</td>
<td>30.391 a</td>
</tr>
<tr>
<td>b2 (20%)</td>
<td>37.597 ab</td>
</tr>
<tr>
<td>b3 (25%)</td>
<td>41.455 b</td>
</tr>
</tbody>
</table>

From Table 9 is known that the concentration of sucrose 15% (b1) does not provide a significant difference to the sugar total of the products fruit leather jack, but the concentration of sucrose 20% (b2) and 25% (b3) give a significant difference in the products of fruit leather cempedak.

This is due to the higher concentration of sucrose is added, the higher the total sugar content in the fruit leather jack, because the disaccharide sucrose is the sweetest of all three types of common disaccharide sucrose has sweetness 100. excipients (corn starch) in addition to functioning to give a rough texture and form a hard coating films but also as a thickener and stabilizer, may slightly reduce the flavor because of the disintegration of amylose and amylopectin occurs, during heating and drying,
so that the total sugar content in the material decreases. Basic tastes of sweet generally suppressed by the addition of hydrocolloid.

From Table 9 is known that the total level is 41.455% of the largest and the smallest is 30.391%. This happens because during boiling and drying a solution of sucrose would undergo an inverse or solution of sucrose into glucose and fructose under the influence of acid and heat that will increase the solubility of sugar [8]. Thus the drying process can reduce the levels of sucrose in fruit leather jack.

Sucrose is widely used in the preservation of fruits, vegetables and manufacture of a variety of food products. Some food products high in sugar content tend to be damaged by yeasts and molds, a group of microorganisms that are relatively easily damaged by heat [10].

![Figure 3. The addition of sucrose concentration histogram Against](image)

### 3.2.3 Total Acid Levels

The total number of acid in foodstuffs is expressed by the total acid. Agricultural materials contain many organic acids. Fruits contain relatively high levels of acid, such as citric acid is the main organic acids in these acids.

Based on Variance Analysis turns filler treatment and sucrose concentration did not give a real impact.

This is because more and more of sucrose are added, the total leather jack fruit acid would be lower. The presence of sweetness on the product it will cover the sour taste of fruit leather jack that affect the pH of the product [10].

Citric acid is a crystalline solid that is highly soluble in water, become hydrated citric acid at 55°C, and melt at a temperature of 160°C. Citric acid crystals are white, translucent, odorless and has a sour taste. The citric acid in the food and beverage industry is widely used as a conduit of a sour taste, refreshment and preservatives. Citric acid can also intensify other flavors reception, Winarno [11].

According to Winarno (1997), in general, citric acid is used as a preservative because it can lower the pH, but it is also used to reduce the sweetness, add flavor, improve the properties of colloidal of foods that contain pectin, improves the texture of jelly and jam, helping the extraction of pectin and pigments from vegetables and fruits. For more details can be seen in Figure 4.

![Figure 4. Histogram Effect Concentration Fillers and Sucrose Concentration Levels of Total Acid Against Fruit Leather Products Cempedak](image)
3.2.4 Fiber Content

Fiber is a substance that cannot be digested by the digestive organs of humans and animals. The term dietary fiber is different from the term fiber. Fiber is very important in the study of quality food, because this figure determines the nutritional value of foodstuffs [8].

Crude fiber is the part of food that cannot be hydrolyzed by chemicals, while the dietary fiber is the part of food that cannot be hydrolyzed by the enzyme in the stomach or small intestine, the one that will determine the quality of Fruit leather is the content of crude fiber contained in material [8].

The analysis showed that treatment concentration maize starch, sucrose, and the interaction between sucrose and maize starch is not significant effect on levels of fiber Fruit leather jack.

This is because sucrose is not a fiber but disaccharide and maize starch is not a fiber but polysaccharides that contain fiber contained in the products is not so show different results. For more details can be seen in Figure 5.

![Figure 5. Histogram Effect Concentration Fillers and Sucrose Concentration Levels Of Fruit Leather Products Fiber Cempedak](image)

3.2.5 Vitamin C

Vitamin C or ascorbic acid has a molecular weight of 178 with a molecular formula C6H8O6, in pure form is a crystal colorless and odorless. Melting point of vitamin C is 190-192°C. Vitamin C is the vitamin most easily broken, easily soluble in water and easily oxidized in the presence of heat, light, alkali, enzyme, oxidant as well as copper and iron catalysts [8].

Results of statistical analysis in Table 3 indicate that treatment of sucrose concentration giving real effect to the vitamin C content of Fruit leather jack.

<table>
<thead>
<tr>
<th>The concentration of sucrose</th>
<th>Levels of Vitamin C (mg / 100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>b1 (15%)</td>
<td>0.046 a</td>
</tr>
<tr>
<td>b2 (20%)</td>
<td>0.069 bc</td>
</tr>
<tr>
<td>b3 (25%)</td>
<td>0.070 c</td>
</tr>
</tbody>
</table>

From Table 3 it is known that the concentration of sucrose 15% (b1) significantly different from sucrose concentration of 20% (b2) and 25% (b3), but the concentration of sucrose 20% (b2) and 25% (b3) does not provide a significant difference on levels vitamin C from fruit leather products cempedak.

This was due to the lower sucrose then the higher the vitamin C content. It is presumed that with the addition of sucrose does not inhibit the oxidation of vitamin C, so that the amount of vitamin C which is oxidized higher. Vitamin C in fruit undergone renovation after processing or storage. Vitamin C is a compound that is readily soluble in water, has acidic properties and a strong reducing properties and easily oxidized catalyzed by several metals, especially Cu and Ag.

From Table 3 it is known that the largest total concentration is 0.070 mg and the smallest is 0.046 mg.
3.2.6 Sense

The taste is an important factor of a food product in addition to the texture, the appearance and consistency of materials that will affect the taste caused by these foods. The taste of a food can be derived from the nature of the material itself or due to other substances that are added to the treatment process.

Generally food does not only consist of one flavor, but the taste is intact. The taste of a food is a result of the integration cooperation of other senses, such as smelling sensory, visual and tactile observations that contribute to the food. The taste is an important factor of a foodstuff products in addition to color, and aroma. In addition the texture of the consistency of the material will affect the flavor of the resulting material. Each foodstuff will have a distinctive taste in accordance with the nature of the material itself, or because there are other substances that are added during the manufacturing process, so that the original flavor is reduced or it may be better, Priyanto [12].

The addition of corn starch thickening agent can reduce acid taste and sweetness as sucrose but will improve the taste of salty and sweet saccharin. The taste is influenced several factors: chemical, temperature, concentration and interaction with other flavor composition [8].

In general, the basic tastes of sweet, sour, salty and bitter suppressed by the addition of corn starch. The sour taste of citric acid is greatly reduced if there is a solution containing corn starch. The events of this displacement is caused by transfer properties, namely the rate of diffusion of molecules that bring nature to taste some of the organs of taste is slow. The addition of fillers and sucrose will affect the taste of Fruit leather jack so that the organoleptic test. Statistical analysis showed that the concentration of sucrose gives a real impact on the taste of Fruit leather jack. This can be seen in Table 4.

<table>
<thead>
<tr>
<th>The concentration of sucrose</th>
<th>Total sugar content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>b1 (15%)</td>
<td>1.711 a</td>
</tr>
<tr>
<td>b2 (20%)</td>
<td>1.781 ab</td>
</tr>
<tr>
<td>b3 (25%)</td>
<td>1.822 b</td>
</tr>
</tbody>
</table>

From Table 4 it is known that the concentration of sucrose 25% (b3) does not provide a significant difference to the vitamin C content of the products fruit leather campedak, but the concentration of sucrose 15% (b1) and 20% (b2) a significant difference in the products of fruit leather cempedak.

This was due to the higher concentration of sucrose sweetness of sucrose will increase but to a certain concentration of good taste generated will decrease [8]. The foregoing caused by the excipients (corn starch) can maintain a sense of raw materials thus remain distinctive flavor Cempedak. Products with a slightly sour sweet taste is preferred by the panelists. The results of calculations of data obtained a real difference to the taste of fruit leather jack, and selected is treatment a1b2 (filler 1%, sucrose 20%), based on the use of a lower concentration of corn starch.

3.2.7 Color

The factors that determine the quality of food ingredients such as flavor, color, texture and nutritional value, in addition there are other factors such as microbiologis. Tapi before other factors are considered in visual color factor appears first and sometimes very decisive.

Determining the quality of foodstuffs in general depends on several factors, one of which is the color. A food that is high in nutritional value, tasty, and very good texture will not be eaten if the color is not good in view. In addition as a factor that will determine the quality, color can also be used as an indicator of uniformity or maturity [11].
Statistical analysis showed that the concentrations of each of the excipients (corn starch), sucrose concentration and interaction concentrations of excipients (corn starch) and the interaction of the sucrose concentration did not give a significant effect on fruit color leather jack.

Results of organoleptic data calculation obtained difference no significant effect on the color of Fruit Leather jackfruit, and the elected is the treatment a1b2 (maize starch 1%, sucrose 20%). This is due to the greater sucrose then the average value of color tend to be bigger, which means increasingly preferred by the panelists. The difference of color is thought to be due to differences sucrose, because of the higher amount of sugar added to the fruit color leather Cempedak getting dark. This is because the process of browning caused by heat-called non-enzymatic browning. Colors are caused due to the caramelization process, that is, when a sucrose solution was evaporated concentration must be increased as well as its boiling point [8].

Corn starch concentrations can affect the color of leather jack fruit, maize starch concentration higher then the average value greater color where increasingly preferred by the panelists. With increasing concentrations of corn starch, then the color will fade, a condition caused by the development of maize starch, maize starch where more and more are added then the greater the development process so that the color will fade and murky [8]. For more details on the results of the panelists A fruit leather colors seen in Figure 6.

![Figure 6. Histogram Effect Concentration Fillers and Sucrose Concentration Against Fruit Leather color Cempedak](image)

### 3.2.8 Texture

Texture is the nature of the observed pressure with the mouth (when bitten and chewed and swallowed) and touching with a finger. The properties concerned flavor when hard texture or material weakness when bitten [8].

In the assessment of food texture through tactile sense that there are nearly on the entire surface of the skin with different sensitivities such as the mouth, lips, and hands have a high sensitivity to touch. Palpability nature generally attributed to three things: the structure, texture, and consistency. The structure is the nature of the components of the material, the texture of a food sensation that can be observed with the mouth when bitten, chewed and swallowed. While consistency is a cause related to the characteristic properties of materials such as thick, thin, and smooth. One of the properties of foodstuffs wet spring is plastic texture. Tenderness is one of the parameters of texture, which is often used as the basis of the consumer's choice of a product.

Statistical analysis showed that the concentrations of each of the excipients (corn starch), sucrose concentration and interaction concentrations of filler (corn starch) and the interaction of the sucrose concentration did not give a significant effect on the texture of leather jack fruit

Results obtained data calculation organoleptic real difference to the texture Fruit Leather jackfruit, and the elected is the treatment a1b2 (maize starch 1%, sucrose 20%). This is because the texture of the fruit leather jack influenced by the addition of excipients (corn starch) and sucrose. High amounts of sugar will make food more tender and moist, because the sugar binds water present in the product [10]. For more details about the hedonic test on the texture can be seen in Figure 7.
3.2.9 Aroma

Aromas or odors may be defined as something that can be observed with the sense of smell. These substances can be evaporated aroma, slightly soluble in water and slightly soluble in fat. Aromas or odors caused by food delicacies determine much of the [8]. Odor generated by the food, many decisive against the food delicacy. Odor generated generally caused by chemical changes and form compounds with other ingredients, such as between amino acid change results of proteins with sugars reduction form compounds the flavor and aroma of the food.

Processing of different factors that can cause that caused the aroma will be different. Aroma is a specific substance or component that has several functions in the food, which can be ameliorative, create more valuable or acceptable so the role of aroma here is able to attract consumer preference to that food. Tests on the aroma is considered important because it can quickly provide an assessment of whether or not a product is accepted by consumers [8].

Based on the results of ANOVA showed that the real effect of treatment between maize starch concentration interaction with the interaction of sucrose on the aroma of fruit leather jack. The treatment of the interaction between maize starch concentration with sucrose concentration on the aroma of fruit leather jack. This can be seen in Table 5.

**Table 5. Effect of maize starch concentration and sucrose concentration against Aroma Fruit Leather Cempedak**

<table>
<thead>
<tr>
<th>Concentrations of Fillers (maize starch)</th>
<th>b1 (15%)</th>
<th>b2 (20%)</th>
<th>b3 (25%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a1 (1%)</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>1,889</td>
<td>1,783</td>
<td>1,804</td>
</tr>
<tr>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>a2 (2%)</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>1,836</td>
<td>1,777</td>
<td>1,809</td>
</tr>
<tr>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>a3 (3%)</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>1,730</td>
<td>1,831</td>
<td>1,789</td>
</tr>
<tr>
<td>a</td>
<td>a</td>
<td>a</td>
<td>b</td>
</tr>
</tbody>
</table>

Information :

Subparagraph (small) read the direction lines and letters (large) read directions column, different letters stating the real difference in the level of 5%.

In Table 5 treatments the addition of sucrose concentration of 15% (b1) showed a significant difference to the aroma of fruit leather jack on each additional filler corn starch. Treatment adding sucrose concentration of 20% (b1) shows a significant difference to the aroma of fruit leather jack on each additional excipients corn starch.
While the treatment of sucrose concentration of 25% (b3) showed a significant difference to the aroma of fruit leather jack on each additional filler corn starch. Allegedly this is due to the concentration of corn starch 1%, 2%, 3% and 15% sucrose and 20% is adequate to provide a different aroma without losing the aroma of jack fruit itself.

Jack fruit has a fairly sharp aroma. Flavoring is derived from ethyl butyrate ester compound in the flesh. With this pungent aroma enough then jack fruit is quite popular [1].

In Table 5 treatments 1% addition of corn starch (a1) did not show a significant difference to the aroma of fruit leather jack on each addition of sucrose concentration. In the treatment of maize starch addition of 2% does not show a significant difference to the aroma of fruit leather jack on each addition of sucrose concentration.

While on treatment the addition of starch cornstarch 3% (a3) show a significant difference to the aroma of fruit leather jack on the addition of sucrose concentration of 25% (b3) but did not show a significant difference to the aroma of fruit leather jack on the addition of sucrose 15% (b1) and 20% (b2).

Allegedly this is due to the effectiveness of maize starch lies not only in its function as emulsion stabilizers, but also reduce the viscosity of the mixture of leather jack fruit maker, to help facilitate the spread of the particles so that a homogeneous material. The interaction addition of sucrose and corn starch produce significant difference to the aroma of fruit leather jack. Allegedly this is due to maize starch is an elastic substance called gluten. Gluten formed by proteins and glutenin an order of fruit leather, as it also greatly affects the sensitivity of fruit leather.

Due to an interaction between sucrose and maize starch then the aroma of fruit leather becomes better jack. In Table 5 is known that the sucrose concentration of 15% and 25% showed increased concentrations of corn starch, the aroma of fruit leather jack increasingly unpopular. But it does not happen at a concentration of 20% sucrose

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusion
a. From the results of the preliminary study obtained types most appropriate filler in the manufacture of leather jack fruit, namely maize starch, because based on an assessment of organoleptic taste and aroma are preferred by the panelists.
b. Treatment concentrations of filler material provides no real effect on the response of moisture content, total acid, and fiber, but provides a significant effect on the total sugar content.
c. Treatment of sucrose significant effect on levels of total sugars, vitamin C, flavor and color and no significant effect on water content, fiber, total acid, aroma and texture.
d. The interaction between the filler and the concentration of sucrose significant effect on the color and no significant effect on the aroma, color, flavor, moisture, fiber, total acid, vitamin C and total sugars.
e. Based on the chemical analysis it can be concluded that the most optimum result of the manufacture of leather jack fruit is combined treatment a2b1 (2% maize starch and 15% sucrose).

4.2 Recommendations
a. It is necessary to conduct further research on the treatment concentration needs to be increased and the shelf life of the fruit leather products Cempedak
b. Keep the packaging process so as to maintain the shelf life of fruit leather products Cempedak

V. REFERENCES