

Value Added Analysis and Quality Test of Cassava Crackers (Manihot Esculenta Crantz) in the Household Agroindustry in Cot Glie Aceh Besar District

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Abstract

In Indonesia, especially in Aceh Province, cassava is often used as raw material for the food industry, so the food is considered crucial in various businesses food product. The purpose of processing cassava into a food product is to increase the durability of the cassava plant so that the selling price of cassava is more economical. One of the examples of the diversifying processed products from cassava is cassava cracker; and one of the centers of production in Aceh Province. It is located in Cot Glie Aceh Besar. The present study aimed to measure the added value and test the quality of cassava crackers produced in Cot Glie District. Particularly, this study aimed to answer the following questions: (1) How is cassava manufactured into cassava crackers?, (2) How is the added value generated from processing cassava into cassava crackers in Cot Glie region?, (3) How is the quality of cassava cracker produced in household agro-industry of Cot Glie Aceh Besar?. The Snowball Sampling method was employed in determining the samples, and value-added analysis the Hayami method was employed. The findings of the research can be concluded as follows: (1) The process of processing cassava into cassava crackers on a household industrial scale in the study area is still relatively simple, (2) The added value generated from processing cassava into cassava crackers on a home industry scale in the study area is also still relatively simple, (3) The quality test of the water content and ash content produced in the business cassava crackers in the household industry scale of the study area has met the standard of SNI 0272-1990, with a maximum water content of 11% and a maximum ash content of 2%.

Keywords: cassava, crackers, value-added, quality, agroindustry

1. Introduction

The agricultural sector plays an important role in the economic growth of the country, especially in an agrarian country like Indonesia. The agricultural sector in agribusiness insight in agrarian agriculture plays a role in providing several things that show economic-based advantages, one of which is the added value to the agro-industry, for example by preserving agricultural products into processed products that are more durable and ready for consumption (Hanani, 2003).

Agro-industry is a form of activity that processes raw materials derived from plants and animals. Soekartawi (2002) defines agro-industry in two ways, namely: first, agro-industry as an industry with main raw materials from agricultural products and second, agro-industry as a development stage as a continuation of agricultural development but before the development stage reaches the industrial development stage.

In the distribution process of agricultural commodities, there is a flow that flows from upstream to downstream, starting with farmers and ending with consumers. Agricultural commodities receive treatments such as processing, preservation, and transfer to add utility or create added value. There are two ways to calculate the added value, namely by calculating

added value during the processing process, and secondly, by calculating added value during the marketing process (Baroh, 2007).

Cassava (*Manihot esculenta* Crantz) is the second-largest agricultural food product after rice, so cassava has the potential as an important raw material for various food and industrial products (Koswara, 2009). And also cassava is one of the village potential crops in the area.

Previous research on the analysis of the added value of cassava crackers was carried out by Kamisi (2011) in his journal entitled "Business Analysis and Added Value of Cassava Crackers Agroindustry" which was conducted in the District of Central Ternate City, North Maluku Province. From the research results, it was reported that the value-added of the cassava cracker production was Rp. 2,782.8 / kg. This value was obtained from the product value of the reduction in the price of raw materials and the contribution of other inputs. So if you make 100 kg of cassava crackers, you will get an added-value of IDR 278,280 with a value-added ratio of 61% of the production value.

The present study aimed to measure the added value of cassava crackers production and to test the quality of cassava crackers produced in Cot Glie, Aceh Besar District. It is suspected that the quality of the cassava crackers produced has met SNI.

2. Method

The research area is determined purposely. The area chosen is the area where the home industry is established, Cot Glie District, Aceh Besar. The location is surrounded by the villages of Banda Safa, Lamtui, Lampakuk, Lam Aling, and Lampoh Raja. Cot Glie is known for its home industries that process cassava crackers.

The population of this study were entrepreneurs of cassava crackers in Cot Glie District, Aceh Besar. Sampling was carried out by using the Snowball Sampling method. The researchers met a cassava cracker entrepreneur and appointed the next respondent or sample according to the characteristics required in this study. The total samples obtained was 5, each was from different villages in the Cot Glie District, Aceh Besar.

To see how much added value from the production of cassava into cassava crackers, the Hayami method was used. The added value calculation formula is as follow:

$$NT = NP - (NBB + NBP)$$

With information:

NT = Value Added (Rp / Kg)

NP = Value of Processed Products (Rp / Kg)

NBB = Value of Raw Material (Rp / Kg)

NBP = Value of Supporting Materials (Rp / Kg)

The test criteria are:

If the value added ratio is > 50%, the added value is classified as high

If the value added ratio is <50%, the added value is classified as low (Sudiyono, 2004)

The quality of cassava crackers is tested by measuring the moisture content and ash content of the cassava cracker products produced by each respondent. The methods are as follows:

Water content

Empty plates to be used were dried in the oven for 15 minutes or until a fixed weight was obtained, then cooled in a desiccator for 30 minutes and weighed. A sample of approximately 2 grams was weighed and placed in a cup then heated in an oven for 3 hours at a temperature of 105-110°C. The plate was then cooled in a desiccator and after it was coldly weighed. The

treatment was repeated until a constant weight was obtained. The percentage of moisture content (dry weight) was calculated using the following formula:

$$\text{Moisture content (\%)} = (B1-B2) / B \times 100\%$$

Information :

B = Sample weight (grams)

B1 = Weight (sample + plate) before drying

B2 = Weight (sample + plate) after drying

Ash content

A total of 2-3 g of the sample was weighed and put into a porcelain dish. Then the sample is annealed on a bunsen burner until it did not smoke anymore, then ashes were carried out in an electric furnace at a maximum temperature of 550°C for 4 - 6 hours or until white ash was formed. The sample was then cooled in a desiccator, then weighed. Drying was repeated until a constant weight was obtained. Calculation of ash content was carried out using the following formula:

$$\text{Ash Content} = (\text{Ash Weight}) / (\text{Sample Weight}) \times 100\%$$

3. Results and Discussions

3.1 The processing of cassava crackers

The stages in processing cassava raw materials into cassava crackers consist of procurement of raw materials, stripping, cutting, washing, grating, making dough, steaming, cooling, filling, and drying, a description of the activities carried out in the production process of cassava cracker processing are as follows:

3.2 Preparation of raw materials

The preparation of raw materials carried out is sorting, it is aimed to select good quality raw materials so that the products produced can have good quality. Based on the results of observations and interviews with respondents in the research area, it is known that the amount of the raw material for making cassava crackers, cassava is sufficiently available as needed. Most of them come from local areas of Indrapuri, Aceh Besar. The other materials used beside cassava are water, dye, and salt.

3.3 Production process

In carrying out the production process of cassava crackers, every industrial business has the same stages. The stages are as follows:

a) Stripping

The cassava that has been selected is peeled but previously discarded at each end. The peel of the cassava is done with the tip of a knife, then the skin starts to peel off until it is clean.

b) Washing

The peeled cassava is then washed with running water for 3 times so that it is clean from all dirt and drained.

c) Grated

Cassava that has been washed is sliced (chopped) thinly using a chopping tool in a round slice shape with a thickness of 0.6-0.8 mm so that the same size is obtained and then shredded.

d) Making cracker dough

The making of cracker dough is an important step in making crackers. Salt and dye are mixed, then dissolved with water that was previously heated to a boil while stirring until a slurry-shaped mixture is obtained. Furthermore, the dough is then kneaded by hand to produce a tough and homogeneous dough.

e) Cracker dough printing and steaming

Cracker dough printing can be made into a cylindrical, sheet and circular shapes. The cracker dough is put into 2 kg plastic and formed into a cylinder ± 3 cm in diameter and then dried. Then steamed until cooked for 2 hours.

f) Cooling and hardening

The cooked dough is removed and cooled and left for one day at room temperature or in the refrigerator so that it hardens. The purpose of this hardening is to make it easier to cut.

g) Incision

Once hard enough, the dough is sliced 1-2 mm thick. The knife used for cutting is occasionally smeared with cooking oil to prevent the dough from sticking.

h) Drying

The results of the slices of cassava are then dried in the sun by drying the crackers on a tray made of woven bamboo (*bleut*) until they are completely dry for 5 hours every day and done for two days. After drying, the raw crackers are immediately packed. Dry raw crackers are indicated by their color that has changed from white to slightly yellowish, then the texture becomes hard.

From observations and interviews conducted by researchers with the owners of cassava cracker processing businesses in Aceh Besar, it was found that this business still uses simple tools that do not have high capacity. The producers have not used modern equipment in the process of their cassava crackers production. Thus hypothesis 1 which states that the processing of cassava crackers carried out in the research area is still relatively simple, and the hypothesis is acceptable.

Added value obtained from processing cassava crackers

The analytical method used to determine the added value obtained from processing cassava into cassava crackers is the Hayami Method. The output (processed product) produced in this process is cassava crackers.

1. Input and Output

Input is the sum of the raw materials used during a production period to be processed into cassava crackers and measured in kilograms (kg) of raw materials. Output is the sum of products / outputs produced during a production period measured in kilograms (kg) of product.

The average use of input and output generated in the study area can be seen in table 1 below:

Table 1. Average Use of Inputs and Outputs Produced in Cassava Crackers Household Agro-Industry in Kuta Cot Glie District, Aceh Besar District, 2020

No.	Description	Input (Kg)	Output (Kg)
1.	Per day	68	22
2.	Per week	184	59
3.	Per month	736	236
4.	Per year	8.832	2.832

Source: Data Processed Results, 2020

From Table 1, it can be seen that, the average amount of output produced during one production period (per day) is 22 kg of cassava crackers from processing 68 kg of cassava. So that the conversion factor obtained is 0.32. This conversion value indicates that every 1 kg of cassava processed 0.32 kg of cassava crackers produced. The conversion factor is the comparison between the use of raw materials and the resulting output (conversion between inputs and outputs). The calculation is as follow:

$$\text{Conversion Factor} = \frac{\text{Output}}{\text{Input}} = \frac{22 \text{ Kg}}{68 \text{ Kg}} = 0,32 \text{ Kg}$$

2. Cost of supporting materials (Other Input Contribution)

Apart from the main raw material, cassava, producing cassava crackers also requires supporting materials (other inputs) such as dyes, water, plastics, firewood and salt. In detail, the costs of supporting materials (other input contributions) in making cassava crackers can be seen in Table 2 below.

Table 2. Average Costs of Supporting Materials Used In Processing of Cassava Crackers In One Production Period

No	Description	Cost (Rp)
1	Dye	8.000
2	Water	2.600
3	Plastic	1.600
4	Firewood	42.000
5	Salt	8.400
Total		62.600
Use of raw materials		68 kg
Total Input Cost (per Kg of Raw Material)		920,6

Source: Data Processed Results, 2020

From Table 2 it can be seen that the total cost of support for cassava crackers in one production period is Rp. 62,600, - and the total cost per kg of raw material for processing cassava crackers is Rp. 920,6, -.

3. Input Price, Output Price, Output Value, Value Added and Value Added Ratio

In detail, the input price, output price, output value, added value and value added ratio of cassava crackers can be seen in Table 3.

Table 3. Average Input Prices, Output Prices, Output Value, Value Added and the Ratio of Value Added Cassava Crackers in the Household Agroindustry Cot Glie District, Aceh Besar District, 2020

No.	Description	Value (Rp / Kg)
1.	Input Price	2.250
2.	Output Prices	16.200
3.	Output Value	5.184
4.	Value-added	2.013,4
5.	Value Added Ratio	38,8%

Source: Data Processed Results, 2020

From table 3 above it can be explained that the average input price (raw material) in the cassava cracker business is Rp. 2,250, - / kg. The output price is Rp. 16,200, - / kg. The output value is Rp. 5,184, - / kg. The output value is obtained from the multiplication of the conversion factor and the output price (Rp / kg).

The added value obtained from the processing of cassava crackers is Rp. 2.013.4 / Kg crackers. The amount of added value is obtained from a reduction in the output value of 5,184 / Kg with raw material costs (input prices) of 2,250 / Kg and costs of other input contributions (supporting costs) of 920.6 / Kg. Mathematically, the value added is obtained from the following calculations:

$$\begin{aligned}
 \text{Value-added} &= \text{Output Value} - (\text{Raw Material Costs (Input)} + \text{Other Supporting Costs}) \\
 &= \text{Rp. } 5.184 - (\text{Rp. } 2.250 + \text{Rp. } 920,6) \\
 &= \text{Rp. } 5.184 - \text{Rp. } 3.170,6 \\
 &= \text{Rp. } 2.013,4
 \end{aligned}$$

The amount of added value obtained from the calculation is in line with the ratio of the value added to the output value. This value-added ratio is obtained from the division between added value and output value expressed in percentage (%). This value-added ratio shows the added value percentage of the output value, meaning that if the value-added ratio is > 50% then the added value is greater than the output value and the added value is categorized high, whereas if the value-added ratio is ≤ 50%, the added value generated is smaller from the output value and the added-value is categorized low. Mathematically, the value added ratio of cassava cracker processing is as follows:

$$\begin{aligned}
 \text{Value Added Ratio} &= \frac{\text{Value-added}}{\text{Output Value}} \times 100\% \\
 &= \frac{2.013,4}{5.184} \times 100\% \\
 &= 0,388 \times 100\% \\
 &= 38,8\%
 \end{aligned}$$

Thus as the percentage of the added-value is 38.8%, hypothesis 2 which states that the added value generated from the processing of cassava into cassava crackers in household agro-industries in the study area is still low, is accepted.

Results of Testing Water Content and Ash Content for Chemical Analysis of Cassava Crackers

The water content is very influential on the crackers produced because the high water content makes the crackers more easily contaminated by microbes and cannot stand being stored for a long time. The water content of raw crackers in accordance with SNI 0272-1990 standards

is a maximum of 12%, the water content produced in cassava crackers in the present study is in the range of 6.17% -11.50%, it can be stated that cassava crackers still meet SNI 0272- 1990

which has been defined. Meanwhile, the ash content of the raw crackers when compared to the ash content of the cassava cracker entrepreneurs ranging from 1.31% - 1.73% can still be stated to meet the SNI 0272-1990 with the maximum ash content found of 2%. Thus, hypothesis 3 which states that the quality of the cassava crackers produced has met SNI. And it is accepted.

4. Conclusions

Based on the research results it can be concluded that: (1) The processing of cassava into cassava crackers in the household agro-industry in Cot Glie District, Aceh Besar is still relatively simple (2) The added value generated from processing cassava into cassava crackers in household agro-industries in the research area is still low (3) The quality test of water content and ash content produced in the business of processing cassava into cassava crackers in the household agro-industry in the study area has met the standards of SNI 0272-1990 for maximum moisture content of 11% and a maximum ash content of 2%.

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