THE QUALITY OF ROBUSTA RICE COFFEE WITH TWO DIFFERENT PROCESSING: CASE STUDY IN BUKIT HITAM COFFE KEPAHIANG HOME INDUSTRY

Tri Sayekti, Fitri Yuwita*, Damres Uker, Meizul Zuki

Department of Agricultural Technology, Faculty of Agriculture, University of Bengkulu 38371, Indonesia

Corresponding author. Email: fitriyuwita.s@unib.ac.id

ABSTRACT

Kepahiang is one of the districts in Bengkulu Province where the majority of people are coffee farmers. These people's coffee plantations are the main support for 30 coffee processing businesses spread across six sub-districts in Kepahiang district as providers of processing raw materials. One of the businesses that is developing is the home industry brand "Bukit Hitam Coffe". This industry processes rice coffee with two types of processing, namely wet-processing rice coffee and dry-processing rice coffee. Processed coffee is coffee purchased directly from coffee farmers. The aim of this research is to determine the comparison of the quality of rice coffee from wet processing and dry processing in the "Bukit Hitam Coffe" home industry. Quality testing includes water content analysis, dirt content, passing 6.5 mm and 3.5 mm sieves, and the number of defect values in accordance with

the Indonesian National Standard No 01-2907-2008. Comparison of the quality of rice coffee using the Paired Sample T-Test. The research results showed that the quality of rice coffee from wet processing was better than the quality of dry-processed coffee. Good post-harvest processing will affect the quality of the coffee produced, so the price of coffee can increase

Keywords: Coffee, Dry-Processing, Wet-Processing, Quality

1. Introduction

Bengkulu is one of the coffee-producing provinces in Indonesia after Aceh Province. The area of Bengkulu coffee plants in 2022 reaches 93 thousand ha, with a total production of 60.1 thousand tons. Kepahiang is the largest coffee producing area in Bengkulu province with production reaching 20.02 thousand tons in 2022 (BPS, 2023). The main factor in the popularity and appeal of coffee is its unique taste and is supported by historical, traditional, social and economic factors (Ayelign & Sabally, 2013). Coffee is a leading commodity of Kepahiang Regency and also a source of income for farmers, can create jobs, provide raw materials and improve the community's economy.

The largest robusta coffee plantation center in Bengkulu province is in Kepahiang regency, the majority of which are community coffee plantations. This community coffee plantation is the main focus for coffee entrepreneurs. Coffee processing contributes greatly to farmers in determining selling value. Processing coffee

beans into coffee is generally divided into three methods, namely dry processing methods, semi-wet processing, and wet processing (Pereira et al., 2019). Currently, the competition that occurs between coffee processing industries is very competitive, both raw material market competition and ground coffee product market (Romdhon *et al*., 2018). Therefore, farmers and entrepreneurs must maintain the quality of coffee quality so that the selling value is high and liked by consumers.

The quality of coffee will affect finances in a business, good quality will increase the profit of a product, which can increase business finance in a company. Quality can also provide satisfaction to customers so as to maintain customer trust in the products to be purchased (Lakamisi & Usman, 2016). The quality of a product is important in an industry. Currently, many industries have not paid attention to the quality of the products produced, including the Bukit Hitam Coffe home industry.

Bukit Hitam Coffe produces rice coffee with two types of processing, namely dry and wet coffee processing. This material from the home industry is purchased directly to farmers with different processing. The dry coffee processing process starts from peeling, mixing, packaging and storage. Wet coffee processing starts from drying, peeling, mixing, packaging and storage. Both ingredients are still used today, but the quality of rice coffee produced from coffee processing has not been considered. Therefore, this study aims to

determine the quality of rice coffee quality from two types of coffee processing so that later it can be used as a reference to improve the quality of the coffee produced.

2. Research Methodology

2.1. Materials and Tools

The material used in this study is rice coffee beans taken from the Bukit Hitam coffe household industry with two different processing, namely dry and wet rice coffee processing. Both types of materials are purchased directly from farmers. The tools used are sieves with diameters of 6.5 and 3.5 mm and cerra moisture testers used to measure the moisture content of rice coffee beans

2.2. Research Procedure

Research on determining the quality of rice coffee with two different processes was carried out with several stages, namely first sample preparation, determination of moisture content, defect value test, coffee bean dirt content, and sieve pass coffee test. Determination of quality requirements criteria for rice coffee beans based on the Indonesian National Standard No. 01-2907-2008.

a. Sample preparation

Robusta rice coffee beans are used as much as 300 gr for each processing, coffee beans are separated in accordance with quality criteria in SNI. The results of the analysis of the separation are then grouped into quality 1 to 6 according to SNI criteria. SNI quality standards are used in ensuring the quality and quality control of coffee beans that will be distributed to subsequent marketing institutions.

b. Moisture test

Test the moisture content of rice coffee in research using a cerra-tester moisture meter to measure the moisture content of the grains. Coffee beans are taken as much as 10 gr then tested using a cerra-tester moisture.

c. Test the defect value and dirt content of coffee beans

1. Physical separation of defective seeds and impurities and calculating defect values and weighing impurities. Physical separation and weighing of objects that can be classified into impurities. Separating dirt in the form of twigs, soil, stones and weighed using an analytical balance with an accuracy of 0.01 g.
2. The impurities content of coffee is calculated in % mass fraction = $\frac{dirt\ weight}{starting\ weight} x100\%$

3. Furthermore, the calculation of defect values is carried out by summing all types of coffee defects with defect values in accordance with the form of determining the number of defects jumlah cacat (BSN, 2008). The defect value determination form can be seen in Table *1.*

d. Test coffee passes sieve
   1. Physical separation using a sieve by weighing fractions of coffee bean fragments or coffee beans passing through the sieve
   2. Weighing 300 g of rice coffee and rice coffee sieve with 6.5 and 3.5 mm diameter sieve for dry processing.
   3. The content of sieve pass coffee is expressed in % mass fraction = $\frac{sieve\ escape\ weight\ (g)}{starting\ weight\ (g)} x100\%$

2.3. Data Analysis

Data from the quality of rice coffee obtained is then processed using Microsoft Excel and then analyzed statistically using T-Test analysis. The T-Test is used to see the difference in the quality of rice coffee in two different processes.

Table 1. Coffee Bean Defect Value Form

No	Types of Defects	Defect Value
1	1 (one) black seeds	1 (one)
2	1 (one) partial black seeds	½ (half)
3	1 (one) black seeds cracked	½ (half)
4	1 (one) spindle coffee	1 (one)
5	1 (one) brown seeds	¼ (quarter)
6	1 (one) large size coffee skin	1 (one)
7	1 (one) medium size coffee skin	½ (half)
8	1 (one) small size coffee skin	1/5 (fifth)
9	1 (one) horn-skinned seeds	½ (half)
10	1 (one) horn skin is large in size	½ (half)
11	1 (one) medium-sized hornskin	1/5 (fifth)
12	1 (one) horn skin of small size	1/10 (tenth)
13	1 (one) cracked seeds	1/5 (fifth)
14	1 (one) young seeds	1/5 (fifth)
15	1 (one) one-hole seeds	1/10 (tenth)
16	1 (one) seeds with more than one hole	1/5 (fifth)
17	1 (one) spotted seeds	1/10 (tenth)
18	1 (one) twigs, soil or large stones	5 (five)
19	1 (one) twigs, soil or medium-sized stones	2 (two)
20	1 (one) twigs, soil of small size	1 (one)

Description: The number of defect values is calculated from the test sample of 300 g. If one seed has more than one defective value, the determination of the defect value is based on the weight of the largest defect value.

3. Result

3.1. General State of Business

Bukit Hitam Coffe is a Home Industry engaged in processing robusta coffee into rice coffee products and

ready-to-brew ground coffee. This Home Industry was established on April 23, 1999 located in West Wetan Village, Kabawetan District, Kepahiang Regency.

3.2. Quality of Rice Coffee

The coffee sample used is rice coffee that has been processed dry and wet by the seller. Then these two types of rice coffee are analyzed for quality based on SNI 01-2907-2008, after testing will be known the quality of both types of coffee ingredients used as samples. The results of testing the quality of rice coffee from both materials used in the Bukit Hitam Coffe industry can be seen in **Table 2**.

3. Discussion

Bukit Hitam Coffe Industry produces rice coffee with 2 different types of cherry processing. The first type is wet cherry coffee and the second type is dry cherry coffee, ingredients purchased directly from the public. Wet cherry coffee is processed into rice coffee starting from drying, peeling, mixing, packaging and storage. While in dried cherry coffee the processing process starts from peeling the skin, mixing, packaging and storage. The rice coffee produced by this industry is then sold to rice coffee traders in the Kepahiang market.

Table 2. Quality Test Results of Dry Processing and Wet Processing Rice Coffee

NO	Types of Coffee Quality Test	Coffee Quality Test Results		SNI 01-2907-2008	95% Confidence Interval		p Value
		Wet Processing	Dry Processing		Lower	Upper	
1.	Moisture Content	19,08%	19,92%	Max 12,5%	-0.89495	0.77171	.000
2.	Number of defective values	134,6	161,55		-3.21676	-.37658	.017
3.	Dirt Content	4,57%	6,42%	Max 0,5%	-2.06706	-1.62628	.000
4.	Coffee escapes sieve						
	6,5 mm	3,49%	5,44%	Max 5 Pcs	-2.12036	-1.77297	.000
	3,5 mm	0%	0%	Max 5 Pcs	0	0	0
5	Quality Categories	**5**	**6**				

Source : Research data, 2023

After the rice coffee is obtained, quality testing is carried out, the results of the quality of rice coffee quality can be seen in **Table 2.** The results showed that the quality of the rice coffee produced was not in accordance with the standards that had been set. The quality of coffee is an important factor that must be considered in meeting consumer demand. One of these factors is the post-harvest processing method, coffee cherries are processed into rice coffee (Sunarharum et al., 2018).

In the **Table 2** , it can be seen that the moisture content of rice coffee obtained is still quite high, namely for dry and wet coffee processing, respectively, which is 19.92 and 19.08%. The moisture content of both types of materials is still very high, not meeting the standard requirements of SNI 01-2907-2008, which is 12.5%. According to Winarno et al., (2021) water content is one of the important parameters in determining coffee quality. The results of the Paired Sample T-Test show a difference in the moisture content of dry and wet cherry processing coffee beans. The moisture content of wet processing cherries is smaller compared to dry processing cherries. This is due to the lack of drying process in rice coffee.

The quality parameters of defective values are separated according to SNI quality criteria, the types of defective values that can occur due to processing are

Types of defects that can occur due to processing are broken beans, spotted seeds, horn-skinned beans, cocoa beans and coffee logs. Black bean defects are caused by coffee attacked by ground pests, the beans will look pale reddish-yellow like ripe coffee fruits, so that after processing they become black bean defects. Perforated seeds can cause chemical quality damage (Winarno & Indah Br Perangin-Angin, 2020).

In the study, the defective value of rice coffee beans from wet cherry coffee material and the number of defective values was 134.6 beans, while the number of defective values in rice coffee beans from dried cherry coffee material was 161.55 beans. This value when compared with the quality requirements of rice coffee based on SNI 01-2907-2008 can be grouped in quality 5 for rice coffee from wet cherry coffee while rice coffee from dried cherry coffee is grouped in quality 6. The defect value measured is in accordance with the provisions of SNI 01-2907-2008 concerning young coffee beans. The defect value measured there are 15 types of defects in coffee beans. In this study, there were types of black beans, partial black beans, broken black beans, log coffee, cocoa beans, large coffee skins, medium coffee skins, small coffee skins, medium horn skins, small horn skins, broken seeds, young beans, one hollow seed, more than one hollow seed, and soil, branches, or stones. The

defective value of black beans will affect total acidity (pH), perforated beans due to insects so that they have a strong influence on taste, but broken beans are generally due to young coffee fruits (Setyani *et al*., 2018). Broken coffee beans are caused by the performance of the huller that is less effective and young beans are caused by harvesters that are done too early. Aklimawati *et al* (2014) stated that the broken beans and coffee skins that contribute to the value of defects. The results of the Paired Sample T-Test test of coffee defect values show that the defective value of wet processing coffee is different from dry processing coffee. The defective value of wet processing coffee is smaller compared to dry processing coffee.

Dirt levels are other objects that are in rice coffee, these dirt levels can be in the form of twigs, coffee skins, stones and other foreign objects. The results of the dirt content test on rice coffee from wet cherry coffee were 4.57% and the results on rice coffee from dried cherry coffee were 6.42%. The results of the dirt content test on the two coffees have not met the quality requirements for dirt content in accordance with the Indonesian National Standard (SNI 01-2907-2008), namely the maximum dirt content of 0.5%. The results of the Paired Sample T-Test for wet and dry processing coffee dirt

levels are different. The yield of wet processing manure content is smaller than dry processing.

Sieve-pass coffee testing parameters are used to separate coffee based on large and small sizes to conform to the Indonesian National Standard (SNI 01-2907-2008) regarding coffee beans. Based on the quality requirements for robusta coffee with dry processing of large coffee using a 6.5 mm diameter sieve (Sieve No.16) 3.5 mm diameter sieve (Sieve No.9), observations were made using analytical balances with an accuracy of 0.01 g. The results of coffee quality testing that passed the 6.5 mm diameter sieve (Sieve No.16) in wet processing amounted to 3.49%, dry processing amounted to 5.44%. The results of coffee quality testing that passed the 3.5 mm diameter sieve (Sieve No.9) in both coffee processing had the same result, which was 0%. Dry processing rice coffee does not meet the quality requirements of SNI 01-2907-2008 while wet processing meets the quality requirements of SNI 01-2907-2008. Based on testing, coffee passed the sieve with a high value on the 6.5 mm sieve because many young coffee beans, coffee were small in size and coffee beans were broken, but did not pass on the 3.5 mm sieve. The results of the Paired Sample T-Test test to pass the wet and dry processing coffee sieve are different. The yield of coffee passing the wet processing sieve is smaller than dry processing.

5. Conclusion

Based on the results of the study, it is known that the quality characteristics of coffee beans based on SNI 01-2907-2008 obtained from wet processing and dry processing can be grouped. The quality results of wet processing are included in quality 5, while for dry coffee processing is included in quality 6.

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