

## Identification of rice characteristics and quality in Sidenreng Rappang Regency

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### ABSTRACT

Identification of the characteristics and quality of rice raises the case study of Sidenreng Rappang Regency. Sample is carried out in each District of Sidenreng Rappang Regency. The research aims to identify quantitatively the character of rice and to determine the quality classification of rice. The research was carried out by analyzing the water content of the sample, identification of head rice, broken grains, granular grains, red grains, yellow/damaged grains, calcifying grains, foreign objects and grain grains. The results showed that rice in Sidenreng Rappang Regency was 54.5% in accordance with the quality requirements of SNI 6128: 2015. While 45.5% of them do not meet quality standards. This shows that the quality of rice in Sidenreng Rappang Regency still needs to be improved, as well as maintaining the quality of rice that is in accordance with applicable quality standards.

### Keywords:

Quality, Rice, Sidenreng Rappang Regency

### 1. Introduction

Rice is the most important staple food for the World Population. In Indonesia, the rice quality standard has been stipulated in the Indonesian National Standard, namely SNI for rice, SNI 6128-2015. SNI rice is classified into quality classes, Premium and Medium, Medium quality classes are divided into medium 1, 2 and 3. The quality requirements for rice are free from pests and diseases, free from musty, sour or other foreign odors, free from a mixture of bran and bran, free from chemicals that harm consumers. While the special requirements for rice based on the quality component are percentage of moisture content, degree of solidity, head grain, broken grain, groats, red grains, yellow/damaged grains, calcified grains, foreign objects and grain grains. The quality of rice is determined by two characteristics, physical and chemical characteristics [1].

Variation in the percentage of head and broken rice can be caused by different locations of rice planting or post-harvest handling. Broken rice occurs when the grain is still slightly wet or too dry when it is ground. The remaining small pieces of rice break into groats. Broken rice can also be caused by the aging process. New reduction stones can produce high broken rice, while worn reduction stones produce less broken rice [2].

Sidenreng Rappang (Sidrap) is a rice-producing district in South Sulawesi Province, Indonesia. This district has been dubbed the "City of rice". In this regency there is



an application-based grain dryer [3], which was launched several months ago. This machine can be used for drying quickly so as to produce rice that is not broken. This drying machine is still limited, so researchers still choose samples that are milled by grinding cars around each District, so that the samples selected actually come from each District in Sidenreng Rappang Regency. However, the question arises, is the quality of the rice produced and the rice circulating in the Sidrap market in accordance with the SNI quality requirements.

The research aims to identify the character of rice and determine the classification of rice quality in Sidenreng Rappang Regency. The research was conducted by taking samples in each district in Sidenreng Rappang Regency. The output of this research is expected to be a guideline for maintaining the quality of rice that is in accordance with SNI, as well as a reference for improving the quality of rice that is not in accordance with the SNI in Sidenreng Rappang Regency.

## 2. Materials and Methods

Research on Identification of Rice Characteristics and Quality in Sidenreng Rappang Regency implemented 2020 at the Study Program Agricultural Product Technology, Faculty of Science and Technology, Muhammadiyah Sidenreng Rappang University, Sidenreng Rappang Regency, sampling is obtained from mobile grinders that do milling in each District and analyzing the water content in laboratory of Food Science and Technology Hasanuddin University.

The tools used in this research are plastic containers, chemical beaker, cup, oven, test water content, desiccators. The materials used in this research are Rice Samples in all Districts in Sidenreng Rappang Regency, sampling is obtained from mobile grinders that do milling in each District and plastic clips. The sample used a random table (Sample code) obtained from each District.

The procedure used in this research are sampling, sample analysis, determination of head grains, broken grains, groats, red grains, yellow/damaged grains, calcified grains, foreign objects were carried out on 100 grams of analysis sample rice which had been separated from broken grains and using a rice grader or using tweezers. Head grain determination, weigh 100 grams of the rice sample, then separated between the head rice and broken/crushed grains using a Rice Grader tester. Broken grains/groats are separated using a 2.0 mm diameter sieve or using tweezers and a magnifying glass visually; weigh the weight of the head rice.

$$\text{Percentage of head rice (HR)} = \frac{\text{Head rice weight}^*}{\text{Example rice weight}} \times 100\% \quad (1)$$

\*The weight of head rice, broken grains, groats, red grains, yellow/damaged grains, Chalking grain, foreign objects.

Water content determination is done by air oven method [4] or with moisture tester electronic which has been calibrated with oven standards. A sample of 5 grams of rice was weighed in a plate with known fixed weight, then dried in an oven dish at 105 °C for 3 hours or until the weight remains, stored in a desiccator, after chilling weighed. The moisture content of rice was calculated as % mass fraction.

$$\text{Moisture Content of Rice} = \frac{B-C}{B-A} \times 100\% \quad (2)$$

A = Cup Weight; B = Sample weight + Cup; C = Dry sample weight + Cup

### 3. Results and Discussion

The results of the research identification of rice characteristics and quality in Sidenreng Rappang Regency can be seen in Table 1.

**Table 1. Specifications of rice quality in Sidenreng Rappang Regency**

Sample Code	Mc (%)	K (%)	P (%)	M (%)	Mr (%)	k/r (%)	Mg (%)	Ba (%)	Bu (w/100g)	Quality
1214	14.21	46	52	0.5	0	0.09	0.4	0.01	0	-
0265	13.77	60	39	0.5	0	0.3	0.09	0.11	0	M3
1113	14.24	81	18	0.9	0	0	0.09	0.01	0	M1
5462	10.34	40	59	0.8	0	0	0.01	0.01	0	-
4353	13.62	80	19	0.5	0	0.3	0.15	0.05	0	M1
3549	11.95	43	53	3	0	0.5	0.25	0.25	0	-
2118	14.09	56	43	0.9	0	0.06	0	0.04	0	-
4117	14.55	69	30	0.5	0	0.29	0.2	0.01	0	M3
0211	14.46	77	22	0.6	0	0.3	0.09	0.01	0	M2
6513	15.55	42	56	1.5	0	0.2	0.1	0.3	0	-
4535	14.23	81	17	1	0	0.3	0.3	0.4	0	M1

Source: Secondary data processed, 2020

Information:

Mc = Moisture content  
 K = Head grain (Min)  
 P = Broken grain (Max)  
 m = Groats grain (Max)  
 Mr = Red grain (Max)  
 k/r = Yellow/Damaged grain (Max)  
 Mg = Calcifying grain (Max)  
 Ba = Foreign grain (Max)  
 Bu = Unhulled grain (Max)

Quality:

P = Premium  
 M1 = Medium 1  
 M2 = Medium 2  
 M3 = Medium 3

Research Identification of Rice Characteristics and Quality in Sidenreng Rappang Regency shows that from 11 (eleven) samples, there are 6 samples that meet the quality requirements specifications in accordance with SNI for rice. The results of testing the quality of head rice from several grain samples showed that there was no rice that was included in the premium quality class because head rice did not reach the minimum 95%. However, there were three samples that met the requirements of medium quality class 1, one sample included medium quality class II and two samples included medium quality class 3. The other five samples did not meet the quality requirements according to SNI for rice.

The results of the analysis showed that the water content of the rice samples in the Sidenreng Rappang Regency was 10.34-15.55%. Based on the water content quality parameters, in general, 63.64% of Sidrap rice meets the requirements for the quality class of SNI 6128: 2015 and 36.36% belongs to the quality class. Two samples had a water content above the maximum quality class limit and two samples had a water content below the maximum quality class limit. Drying grain to a water content of <13% also causes rice to break easily [5].

The identification of head grains, broken grains and groats in Sidenreng Rappang Regency shows that the head rice contained is in the range of 40% to 81%. Based on the rice quality standard, 1113 with a percentage of head grains 81% met the requirements for medium quality 1, while 5462 with a presentation of 40% did not meet the quality requirements. The broken grains contained are in the range 17% to 59%. Based on the quality standard of rice, 4535 with a percentage of broken grains 17% met the quality requirements of medium 1, while 5462 with a presentation of 59% did not meet the quality requirements. The grain grains are in the range 0.5% to 3%, meeting the rice quality requirements in accordance with SNI. The yield of head rice is the main requirement in determining the quality of grain, because it will determine the total weight of rice produced and the economic value of rice. The yield of head rice has a large diversity which depends on various factors, varieties, types of seeds, lime grains, cultivation methods, environmental factors, harvest-free treatment starting from harvesting, threshing, drying, storing, to milling [6].

Drying the harvested unhulled rice to a low water content is thought to cause low head rice yields. The identification showed that the lower the water content (close to 11.5%) resulted in higher head rice, broken grains and lower groats, but the values were not linear. Air humidity of  $88.72 \pm 0.28\%$  also causes the dimensions of rice grains to change from 5.13 mm in length to 4.84 mm and causes rice cracking. Operator skill also affects the percentage of broken grains. From the survey results it is known that using operators with a working period of more than three years, however, no one has ever attended training or certification regarding rice post-harvest skills affecting the quality of rice produced, even though the rice milling process is highly dependent on operator subjectivity [7].

The identification of red grains, yellow/damaged grains, calcified grains, foreign objects and unhulled grains in Sidrap Regency shows that the red grains contained are in the 0% range. The maximum amount of red grains contained meets the premium requirements. The yellow/damaged items contained are in the range 0.09% to 0.3%, the maximum yellow/damaged items contained meet the premium quality requirements. The calcifying grains contained are in the range 0% to 0.4%. The maximum calcification grains contained meet the premium requirements. The foreign objects contained are in a range of 0.01% to 0.4%. The maximum foreign objects contained meet the premium quality requirements. The grain contained is a maximum of 0%, the maximum grain contained meets the premium quality requirements.

Identification shows that the research sample in Sidenreng Rappang Regency is 54.5% in accordance with the quality requirements of SNI 6128: 2015. Meanwhile, 45.5% of them did not meet quality standards. This can be caused by several factors, including the location of rice planting or different post-harvest handling. Broken rice can occur when the grain is still slightly wet or too dry when it is ground. The

remaining small pieces of rice break into groats. Broken rice can also be caused by the aging process. The reduction stones can produce high broken rice, while the worn reduction stones produce less broken rice [2].

#### 4. Conclusion

Research identification of rice characteristics and quality in Sidenreng Rappang Regency, 54.5% is in accordance with the quality requirements of SNI 6128: 2015. Meanwhile, 45.5% of them did not meet quality standards. This shows that the quality of rice in Sidenreng Rappang Regency, still needs to be improved, as well as maintaining the quality of rice that is in accordance with the applicable quality standards.

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