

Quality Analysis Of Organic Rice Variety Mentik Susu And Sintanur Nutritional Approach

Sri Handayani¹, Muhammad Irfan Affandi², Sussi Astuti³

¹ State Polytechnic of Lampung, Departement Economics and Business

² Lampung University, Departement Agribusiness

³Lampung University, Departement Agricultural Technology

Abstract Organic rice production in Indonesia is increasing due to the tendency of consumers who start to consume healthy food and one of them is organic rice. Varieties cultivated by farmers in Lampung Province is mentik susu and sintanur based on high yields and climate suitability. The quality of organic rice can be known through nutritional approach. The purpose of this research is to analyze quality comparison of organic rice of mentik susu and sintanur varieties with nutritional approach. The research methodology used is laboratory research. Data analysis methods used to answer the objective of a proximate test to determine the nutrient content of organic rice in both varieties of mentik susu and sintanur. Nutritional content that is cultivated is carbohydrates, fats, proteins, water, fiber, and ash content. The result of the analysis shows that carbohydrate, protein, and nutrient content of organic rice of mentik susu variety was higher than sintanur varieties. While the fat content, water content, and ash content of organic rice varieties mentik susu is lower than the sintanur varieties. In general it can be concluded that the quality of organic rice varieties mentik susu better than sintanur varieties.

Keywords: Organic Rice, Nutritional Content, Proximate

INTRODUCTION

Food demand is always increasing as population growth increases. The main food ingredients of the community consist of rice, maize, and cassava (Handayani, 2016). As a major food ingredient not only in Indonesia but also in the world, rice has a strategic role in community welfare policy. Indicator of community welfare is the availability of rice both quantity and quality. Increased public awareness for healthy living, starting with a healthy diet. This is in synergy with the increasing amount of organic rice consumption because it has a high nutrient content and free of chemicals. The amount of demand for organic rice in Indonesia reaches 1.1 quintals and always increases every year (Ahmad, 2009). In addition, the benefits of organic rice obtained, among others, is to help improve soil fertility due to reduced application of chemical fertilizers in the soil, minimization of production costs for farmers because only use organic fertilizer / compost, without pesticides, as well as good health benefits for the body.

The main nutrient content in food consists of carbohydrates, proteins, fats, fiber, and water. Carbohydrate is the largest nutrient content in rice and as a source of energy for the body (Hasan & Astuti, 2011). Protein is needed for growth and repair damaged tissues. Fat is one of the important substances but the amount should be limited. Fiber is needed for body digestion, and mineral water functions in the body's metabolism. Each element of nutrients is needed in certain levels for the health of the body. According to Waluyo (2007) in Wahyudin (2008), in his study of differences in organic

and non-organic rice, concluded that organic rice has a higher nutrient content than non-organic rice. The content of carbohydrates and proteins in organic rice more easily decompose / digested by the body. While the content of carbohydrates and proteins in non-organic rice does not decompose / is not easily digested by the body. Furthermore, quality of organic rice compared with non-organic rice such as organic rice is relatively safe for consumption because it does not contain chemical residues, rice texture of organic rice more pulen, color and shelf life is better than non-organic rice (Andoko, 2010).

Proximate analysis is performed to determine the main component of a material. For food, the main components generally consist of moisture content, ash, carbohydrate, protein and fat (Hui, 2006). This analysis becomes necessary to do as it provides the main content data of a foodstuff. Another factor is the proximate analysis in the diet with respect to the nutritional content of the foodstuff. Nutritional levels need to be known as they relate to the quality of the food.

Organic rice production in Lampung Province is located in Pringsewu and Lampung Selatan districts. Types of cultivated varieties are Mentik Susu and Sintanur. The reason for the use of this type of variety is because of its resistance to pest and its taste is delicious. This research was conducted to determine the nutritional content and quality of local organic rice of Mentik Susu and Sintanur variety, and organoleptic properties of both varieties. Levels of proximate studied were moisture

content, ash content, fat content, protein content, coarse fiber content, and total carbohydrate content.

According to Sari et al. (2014) the end of the quality assessment is how much the level of acceptance / consumer preferences of the product in terms of quality components. In general, food products, the value of subjective quality is more prominent than the nature of objective quality. Based on the description, this study aims to examine the nutritional quality of organic rice varieties of Meentik susu and Sintanur .

METHOD

Tools

Tools that used are Porcelain Grille, Eksikator, Erlenmeyer, Hot Plate, Pumpkin Kjedadhal 300ml, Buret 50ml, Electric Oven, a set of distillation apparatus, a set of Soxhlet tools, Electrical furnace, and analytic scales.

Materials

The ingredients that used are alcohol, boric acid (H_3BO_3), Hydrochloric acid (KCl), sulfuric acid (H_2SO_4) Penoftalein indicator, Filter paper, Petroleum ether, NaOH, Organic Rice, varieties of milk and synthetic milk.

Proximate Analysis Procedure

(1) Water content (Method of Oven / AOAC1970, Ranggana 1979)

Weigh the smoothed example 2-5 g. In a porcelain cup that has been known to weigh.

Dry in oven at $105^\circ C$ for 3-5 hours.

Then cool in the Extractor and weigh, reheat in oven for 30 minutes, cool in the Extractor and weigh this treatment repeated until the constant weight (the weighing increment is less than 0.2 mg respectively)

Weight reduction is the amount of water in the material.

$$\% \text{ water} = \frac{B - C}{A} \times 100 \%$$

A = Sample weight

B = plate + wet sample

C = plate + dry sample

(2) Ash Content

Weigh the smoothed example 2-5 g. In a porcelain cup that has been known to weigh

Burn the cup containing the example on the stove until it is not smoky.

Then spice in the furnace at a temperature of $500-600^\circ C$ for 3-4 hours (until ash is obtained whitish)

Cool the saucer and ash in the Extract then weigh.

$$\% \text{ Ash} = \frac{B - C}{A} \times 100 \%$$

A = The weight of the sample (the weight of the cup containing the sample - the empty cup)

B = Grail + Ash

C = empty plate

(3) Crude Fiber

Crude fiber is a residue from food or agriculture after being treated with acid or alkaline boiling, and consists of cellulose with little lignin and pentosan.

Puree the material up through a 1mm diameter sieve.

Weigh 2 grams of dry matter and extraction of fat with soxhlet,

Move in a 600 ml Erlenmeyer flask, add 200 mL of $SO_4 H_2$ solution to boil (1.25 gr $H_2 SO_4$ concentrated / 100 ml = 0.255 N $H_2 SO_4$) and cover with refrigerant, boil for 30 minutes with occasional wobble

Filter suspension through filter paper and residue left on filter paper washed with hot water until it is not acidic anymore (test with litmus paper)

Remove the residue from the filter paper into the erlenmeyer again with a spatula, and the rest cleaned with boiling NaOH (1,25 gr NaOH / 100ml = 0.313 N NaOH) of 200 ml until all the residue goes into the erlenmeyer. Bring to a boil by cooling while sometimes shaking for 30 minutes.

Strain through a filter paper already known by weight or crucified Gooch crucible and known by weight, while washed with K_2SO_4 10 lar solution

Wash again residue with boiling aquades and then with 15 ml Alcohol 95%

Dry filter paper or crucible with its contents at $110^\circ C$ until constant weight (1-2hour) cool in desiccator and weigh.

Residual weight = rough fiber weight

$$\% \text{ crude fiber} = \frac{B - C}{A} \times 100 \%$$

A = Weight sample

B = Filter Paper + Fiber

C = Filter Paper

(4) Protein (Gunning Method)

weigh 0.5 to 1.0 gr of mashed material and put in kjeldahl flask, add 1 gr K_2S or anhydrous Na_2SO_4 , and 10 - 15 ml of concentrated H_2SO_4 . If the distruction is difficult to be added 0.1 - 0.3 gr $CuSO_4$ and gojok

Then performed distruksi above the electric heater in the fume hood, first with a small fire, after the smoke lost fire raised, the heating is ended after the liquid becomes clear colorless again

Created blank treatments, such as the above treatment without an example.

After cooling add to 100 ml of kjeldahl aquades flask, and 45% NaOH solution until the liquid is base, install the kjeldahl flask immediately on the Distillation apparatus.

Heat the Kjeldahl flask until ammonia evaporates all, the distillate is accommodated in an erlenmeyer containing 25 ml of HCl 0.1N which is given a PhenolPtalein indicator 1% of a few drops. The

distillation is terminated after the distillate is reached as much as 150 ml or after the outgoing distillate is not base. Excess of 0.1 N HCl in distillate is titrated with standard base solution (0.1 N NaOH solution) to pink.

$$\% N = \frac{(\text{ml blank of NaOH} - \text{ml sample of NaOH}) \times N \text{ NaOH} \times 14,008}{(\text{mgr. sample}) \times 100}$$

$$\% \text{ Protein} = \% N \times \text{conversion factor}$$

(5) Determination of Fat and Oil (Soxhlet Method)

Weigh carefully 2 - 5gr. Examples that have been mashed, wrap with filter paper. insert in the Soxhlet Extraction tube.

Flow cooling water through the condenser.

Install the extraction tube on the Soxhlet distillation apparatus with solvent (Petroleum Benzen, Chloroform, N. Hexan etc.) to taste. The extraction is done for 4-5 hours.

Dry the cup containing the fat on the Oven with a temperature of 100-105°C for 30 minutes.

The residual weight in the fat plate is expressed as the weight of fat and oil

$$\% \text{ fat} = \frac{B - C}{A} \times 100 \%$$

A = Weight sample

B = Cup + Fat

C = empty plate

(6). Total Carbohydrate Determination

Carbohydrate content is done by using carbohydrate method by difference method. Carbohydrate by difference is obtained from the reduction of the number 100 with the presentation of other components.

RESULT

Rice not only serves as a staple food but also serves as a functional food ingredient that has an active component that is useful for health. Types of organic rice that is widely used are varieties of Mentik Susu and Sintanur. This type of rice contains carbohydrates, fats, proteins, fiber and minerals consumed as a healthy food. Based on descriptive research to know the description of nutrient content in organic rice varieties of Mentik Susu and Sintanur, got the result of examination of nutrient content from Quality Laboratory of Lampung University gave the following result:

Table 1. Result of organic Rice Organic Rice Nutrient

Variabel	Result (%)	
	Mentik Susu variety	Sintanur variety
carbohydrate	80.8079	79.4400
fat	0.8201	1.0761
Protein	5.2475	4.8463
water	12.0900	13.3087

fiber	0.5299	0.6868
Ash	0.5046	0.6421

Based on Table 1, the results of testing of organic rice of Mentik Susu and Sintanur varieties can be explained as follows:

a. Carbohydrate

Proximate test results obtained carbohydrate values for varieties of Milk Milk equal to 80,8079% and Sintanur varieties of 79.4400%. Based on this it shows that carbohydrate content of varieties of milk milk is bigger than Sintanur varieties. Research conducted by Nani Ratnaningsih et al (2010) obtained carbohydrate result of 72,49 - 83,94%. Carbohydrates are a nutrient that serves to produce energy for the human body. In addition, carbohydrates also serve as a sweet giver on food, protein saver, regulator of fat metabolism, helps the expenditure of feces.

b. Fat

Fat content of organic rice varieties of Mentik Susu obtained results of 0.8201% and Sintanur varieties of 1.0761%. This shows that the fat content in the variety of milk milk is smaller than the varieties of Sintanur. Based on the results of laboratory tests of the Industrial Research and Consulting Center Surabaya on March 18, 2004, yielded data that organic rice has a lower fat content than inorganic rice. Although both varieties tested were both organic, the quality of organic rice of Mentik Susu variety was better than that of Sintanur varieties. Fat is an important food substance to maintain the health of the human body. Fat works as a source of energy, dissolves vitamins so that it can be absorbed by the intestine, and prolongs satiety.

c. Protein

Protein content of organic rice varieties of Mentik Susu obtained result of 5.2475% and Sintanur varieties of 4.8463%. This shows that the protein content of Mentik Susu varieties is greater than that of Sintanur varieties. Research conducted by Nani Ratnaningsih et al (2010) obtained the results of protein by 5% -10%. Protein is the main ingredient for plant cells, animals and humans. About ¾ solid body is protein. Proteins function as growth and maintenance, the formation of essential bodily bonds, regulating water balance, maintaining the neutrality of the body, the formation of antibodies, transporting nutrients, and energy sources. Based on the description can be explained that the quality of organic rice nutrition Mentik Susu better than Sintanur varieties.

d. Water

Water content of organic rice of Mentik Susu varieties yielded 12.0900% and Sintanur varieties 13.3087%. Water is the largest component in the structure of the human body. Water serves as a medium for transfortation of nutrients, removes metabolic waste, regulates body temperature during physical activity, and maintains blood volume balance. The result of premium quality standard

(SNI 6128-2015) shows good quality of rice if its water content is less than 14%. Differences in water content in varieties of Mentik Susu and Sintanur can be caused by the process of storage and separation process of rice from different grains, rice separation is not done simultaneously because the process of getting rice varieties following the planting period. Based on the point tersebut can be explained that the quality of organic rice nutrition Mentik Susu better than Sintanur varieties

e. Fiber

The content of organic rice varieties of Mentik Susu obtained by 0.5299% and Sintanur varieties of 0.6868%. The fiber content consists of carbohydrates such as cellulose, hemicellulose, pectin and lignin. This fiber can not be hydrolyzed by digestive enzymes. Materials that contain lots of fiber will accelerate the transit time of food waste in the intestine so that it becomes shorter. The benefits of dietary fiber can lower cholesterol in the blood. According to Kahlon et al (1994), high fiber in rice also affects the mechanism of cholesterol reduction. The mechanisms underlying cholesterol reduction are the ability of lipid-absorbing fibers in the gastrointestinal tract and increased excretion of bile acids. Lattimer et al (2010) revealed that the fat-deprived rice can be used to make the product high.

f. Ash Content

The content of organic rice ash of Mentik Susu varieties obtained by 0,5046% and Sintanur varieties of 0.6421%. Research conducted by Nani Ratnaningsih et al (2010) obtained the ash of 0,71 - 1,69%. Ash content is the residue obtained after the rice oxidation due to heat, ash content as a measure of mineral content in rice. That is, the use of biological fertilizer (compost) which many affect the amount of ash content in organic rice.

CONCLUSIONS

From the results of proximate analysis can be concluded that the carbohydrate content of organic rice Mentik Susu varieties greater is 80.8079% compared to Sintanur varieties of 79.4400%. The fat content of organic rice of Mentik Susu varieties is smaller that is 0.8201% compared with Sintanur varieties is 1.0761%. Protein content of organic rice of Mentik Susu varieties is greater that is 5.2475% compared with Sintanur varieties is 4.8463%. Water content of organic rice of Mentik Susu varieties is smaller that is 12,0900% compared with Sintanur variety that is 13,3087%. The content of organic rice of Mentik Susu varieties is smaller, that is 0.5299% compared with Sintanur varieties is 0.6868%. The content of ash of organic rice of Mentik Susu varieties is smaller that is 0,5046% compared with Sintanur varieties that is 0,6421%. In general it can be concluded that the nutrient content of organic rice Mentik Susu varieties better than Sintanur varieties.

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