NUTRITIONAL AND QUALITY ANALYSIS OF KELOR (Moringa oliefera) BEVERAGE

by Rita Ismawati

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NUTRITIONAL AND QUALITY ANALYSIS OF KELOR (*Moringa oliefera*) BEVERAGE

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This study aims to determine the nutritional and quality value of Moringa beverage consisting of moringa yogurt and moringa jelly drink. Quality drinks obtained through organoleptic test, while the nutrient content through a chemical test. Organoleptic test results for moringa yogurt with moringa leaf extract 20% and incubation time of 6 hours to produce quality: light green, not flavorful Moringa leaves, soft texture, thick, tasteless Moringa leaves and panelists preferred. Moringa yogurt nutrient content per 100g: 2,84 g carbohydrates, 4.75 g protein, 69,57g of fat, calcium 3,087mg, 6,277mg iron, vitamin A 2.885 ppm and 14.652 ppm vitamin C, Lactic Acid Bacteria (LAB) 1,2x104 and pH 5,97. The result of organoleptic test for moringa jelly drink with the ratio of 0.4% carrageenan and pandan leaf extract 3% yield quality: green, viscous and easier to pump, less flavorful Moringa leaves, and quite pandan flavored, less taste pretty tasteless Moringa leaves and pandan, much preferred because the fragrance of pandan fragrance can mask unpleasant from moringa leaves. Nutrient content of moringa jelly drink Per 100g: 11,86g protein, fiber 0.06 g, carbohydrates 14,0 g, fat 6.01 g, 0.48 IU vitamin A, vitamin B 0,0064mg, vitamin C0, 1986 mg , 0.0355 mg Calcium, iron 0.9423 mg, 10.545 mg magnesium, phosphor0,1764 mg, 0.0556 mg potassium, seng0,1226 mg.

Key word : Nutritional, quality, moringa beverage

Introduction

The development of food on beverages marked the emergence of various products such as jelly drink beverages and yogurt that are circulating in the community. Jelly drink is an innovation of jelly, this product combines the functions of jelly as a food as well as beverages. Jelly drink freshness to eliminate hunger while helping to starve (Anonymous, 2015).

Jelly drink is a beverage that has the characteristics of a solid texture, when consumed through a straw relief is destroyed, but the form of the gel is still felt in the mouth. Components include a liquid jelly drink, gelling, Flavor and sweetener (Yulianti, 2008). For the manufacture of jelly drink fluids using a variety of fruit flavors such as lychee, stawberry, apple, guava, citrus and vegetable.

Yoghurt is one beverage products favored by the people. During this time many found the yogurt market with a variety of fruit flavors include strawberry yoghurt, yoghurt and yoghurt peach blackcurrent. Yogurt is a fermented milk product in the form of semi-solid that is produced through fermentation of milk using lactic acid bacteria. Through the chemical changes that occur during the fermentation process produced a product which has the texture and distinctive flavor. Making the use traditional yoghurt starter culture mixture of Lactobacillus bulgaricus and Streptococcus thermophilus in the ratio 1: 1 (Hidayat., Et al, 2006).

Yoghurt processing using vegetables as an additive to improve the nutritional value of yogurt is a new strategy in the diversification of food can also increase the potential of the food itself. One food ingredient that is added in the manufacture of yoghurt that Moringa leaves. Moringa leaf is one food that contains carbohydrates, fiber, vitamin A, vitamin C, Vitamin B, calcium, potassium, iron, and protein, sert zeatin, quercetin, β-sitosterol, acids caffeoyiquinic and kaempferol (Krisnadi: 2012, Kurniasih , 2013). This study makes beverage products, namely jelly drink and yogurt added Moringa leaf extract. The addition of moringa leaf extract is expected to be resulting in more nutritious yogurt with a delicious taste and preference.

Method

This study aims to determine the quality make drinking jelly drink Moringa and yogurt Moringa through organoleptic tests which include: color, aroma, texture, consistency, taste and preferences and know kandunagn nutrients include: carbohydrates, fat, protein, calcium, iron,

vitamin A and vitamin C, the amount of Lactic Acid Bacteria (LAB) and pH. This type of research is experimental. The study design used in the manufacture of jelly drink two factors. Two factors are comprised of one factor is the type of material that is gelling carrageenan (K) which terdidri three levels, namely the presentation (%) of the weight of K1 = 0.2% = 0.3% K2, K3 = 0.4% , while the second factor is the additional material that moringa leaf extract (P) consisting of 3 levels, with a percentage (%) of the weight of Y1 = 1%, 2% and Y2 = Y3 = 3%. The study design of these two factors can be seen in Table 1.

Table 1 : Design Research Jelly Drink Moringa Leaves

Extract Moringa leaves \ carrageenan	K1 (0,2%)	K2 (0,3%)	K3 (0,4%)
	K1P1	K2P1	K3P1
P1 (1%)	K1P2	K2P2	K3P2
P2 (2%)	K1P3	K2P3	K3P3
P3 (3%)	K1 (0,2%)	K2 (0,3%)	K3 (0,4%)

Description:
K = carrageenan
P = Moringa leaf extract fragrant

In the manufacture of yogurt using factorial design dual 2x2 , where the independent variable is the amount of extract of Moringa leaves 20 % , 30 % and 40 % of the weight of milk and incubation time of 4 hours , 5 hours and 6 hours and the dependent variable is the organoleptic quality including color , aroma , texture , consistency , taste and preferences .

The experimental design for data collection are as follows :

Tabel 2. Desain Eksperimen

K \ T	Waktu Inkubasi 4 jam	5 jam	6 jam
20%	$K_1 T_1$	$K_1 T_2$	$K_1 T_3$
30%	$K_2 T_1$	$K_2 T_2$	$K_2 T_3$
40%	$K_3 T_1$	$K_3 T_2$	$K_3 T_3$

Description:
K : percentage increase Moringa leaf extract
Q : incubation time

Data was collected using observation sheet to the organoleptic properties of the number of panelists 30 people . Organoleptic test result data . Menggunakkan data analysis ANOVA test double (two- way ANOVA) If the results show the influence signufikan further tested with Duncan . Nutrient content jelly drinks and yogurt drink Moringa moringa with a chemical test to determine the amount of carbohydrate, protein , fat , calcium , iron, vitamin A , vitamin C , the amount of Lactic Acid Bacteria (LAB) and pH as well as the selling price is calculated .

Result and Discussion

A. Jelly drink Moringa

1. Test Results Appearance

a. Color

Organoleptic test results generated color jelly beverage having an average of 1.63 to 3.36 . The lowest value of 1.63 was obtained on the use of carrageenan amount of 0.2 grams and 3 grams pandan leaf extract , while the highest score of 3.36 on the usage amount of 0.4 grams of carrageenan and fragrant pandan leaf extract 3 grams . The average value of the amount of carrageenan color and fragrant pandan leaf extract in jelly drink Moringa leaves can be seen in Figure 4.17 .

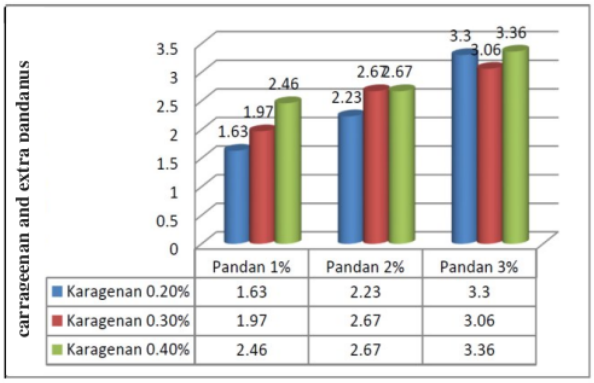

Figure 1 : Average Value Color Drink jelly Moringa Leaves

b . Viscosity

Viscosity is expected of jelly drink Moringa leaves are thick and easy to pump . Based on the results obtained by organoleptic tests produced an average of 1,733 to 3,600 . The lowest value was obtained 1.733 on the use of carrageenan amount of 0.2 grams and 2 grams of pandan leaf extract , while the highest value of 3,600 on the use of carrageenan amount of 0.4 grams and 2 grams of pandan leaf extract . The average value of viscosity to the amount of carrageenan and pandan leaf extract in jelly drink Moringa leaves can be observed in Figure 4.18 .

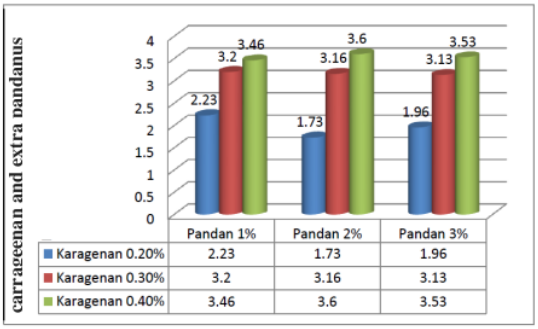

Figure 2 : the average value of viscosity jelly drink Moringa

c. Aroma

is expected of jelly drink Moringa leaves are not aromatic extract Moringa leaves and scented rushes. Based on the results obtained by organoleptic tests produced an average of 1.96 to 3.166 . The lowest value of 1.96 was obtained on the use of carrageenan amount of 0.2 grams and pandan leaf extract 1 gram , while the highest value of 3.166 on the use of carrageenan amount of 0.3 grams and pandan leaf extract 3 % .

The average value of the amount of carrageenan aroma and pandan leaf extract in jelly drink Moringa leaves can be observed in Figure 4.19 as follows

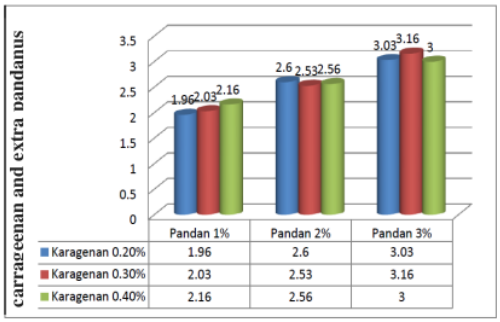

Figure 3 : the average value of aroma jelly drink Moringa

d. Flavor

Expected flavor of jelly drink Moringa leaves are not berarasa extract Moringa leaves and pandan taste . Based on the results obtained by organoleptic tests produced an average of 1.933 to 2.900 . The lowest value was obtained 1.933 on the use of carrageenan amount of 0.2 grams and pandan leaf extract 1 gram , while the highest value of 2,900 on the use of carrageenan amount of 0.4 grams and 3 grams pandan leaf extract . The average value of a sense of the amount of carrageenan and pandan leaf extract in jelly drink Moringa leaves can be observed in Figure 4.21 .

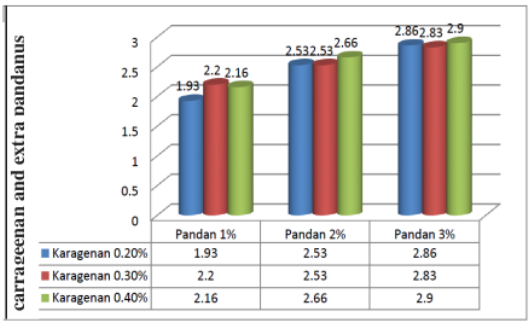

Figure 4 : the average value of flavor jelly drink Moringa

The best known product of the assessment of the results so panelists jelly drink Moringa leaves are seen from the quality and level of preference that include: color, consistency, aroma and taste. Determination of the best products based on the test results anava jelly drink Moringa leaves can be seen in the best product jelly drink Moringa leaves oganoleptik based test is X9 is the number carrageenan extract 0.4 grams and pandan leaves 3% significant. Jelly drink product best Moringa leaves have a green color criterion with a value of 3.36, viscous easy to be sucked with a value of 3.53, not flavorful extracts of Moringa leaves and pandan flavored with a value of 3.16 tasteless extract Moringa leaves and pandan taste with a value of 2 90 and A-level sense is like the value of 4.20.

2. Test Results The content of nutrients

The content of nutrients known after chemical tests that showed jelly drink Moringa leaves better nutritional content and many kinds of in the market today. Jelly drinks nutrient content of Moringa leaves 11.86 g protein, fiber 0.06 g, carbohydrates 14.0 g, fat 6.01 g, 0.48 IU vitamin A, vitamin B 0.0064 mg, 0.1986 mg vitamin C , 0.0355 mg Calcium, iron 0.9423 mg, 10.545 mg magnesium, phosphorus 0.1764 mg, 0.0556 mg potassium, zinc 0.1226 mg (per 100 g). The selling

price of beverages jelly Moringa leaves of Rp 733.00 per 100 ml, but fiber and carbohydrates in jelly drinks on the market higher.

B. Yogurt Moringa

1. Test Results Appearance

a. Color

Organoleptic test results yoghurt Moringa color shows the average value of the color of yoghurt ranges from 1.3 to 2.53. The average value of the color of yoghurt from all treatments shown in Figure 2.

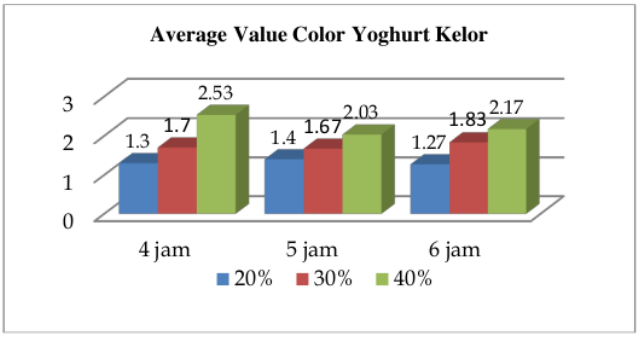

Figure 5. Graph Average Value Color Yoghurt Kelor

b . Aroma

Yoghurt aroma organoleptic test results Moringa shows the average value of scents ranging from 2.3 to 3.43 . The average value of Moringa yoghurt aroma of all treatments shown in Figure 3 .

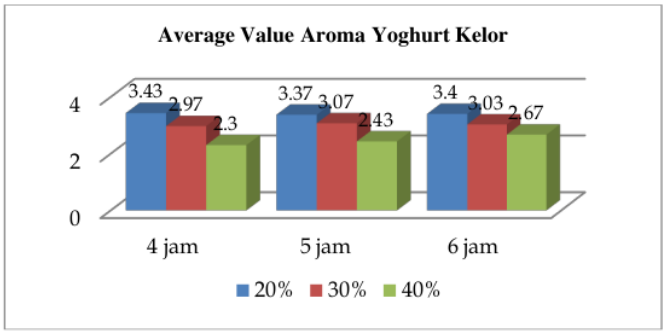

Figure 6. Graph Average Value Aroma Yoghurt Kelor

The addition of moringa leaf extract affects the aroma of yoghurt due lipoksidase Moringa leaves contain enzymes , enzyme is found in green leafy vegetables because lipoksidase enzymes hydrolyze or decipher fat into compounds cause unpleasant odors , which belong to the group heksanal 7 and hexanol (Santoso 2005) . The unpleasant aroma can be reduced by blanching (quickly dip) .

c . Flavor

Moringa yogurt organoleptic test results refer to average texture values ranged from 3.23 to 3.53 . The average value of Moringa yogurt texture of all treatments shown in Figure 4 .

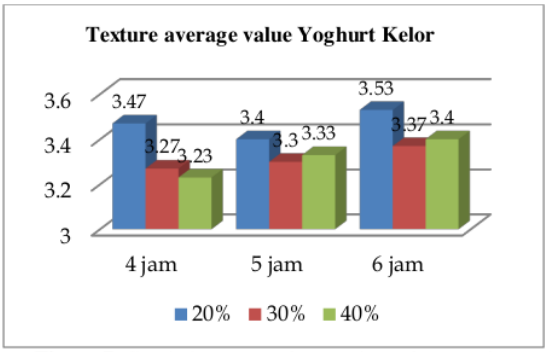

Figure 7. Graph Average Value Yoghurt Flavor Kelor

d . Viscosity

Moringa yogurt organoleptic test results showed that the average viscosity values ranging from 2.4 to 3.37 . The average value of Moringa yoghurt consistency of all treatments shown in Figure 5 .

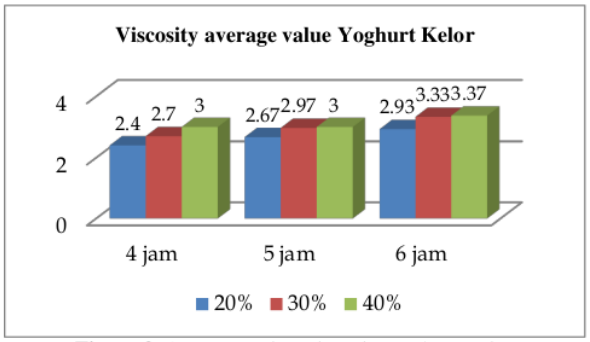

Figure 8. Average Value Viscosity yoghurt Kelor

Viscosity or viscosity of the yoghurt drink Moringa leaves as the main ingredient used in the form of milk , if milk becomes acidic , the bacteria ferment the lactose in milk , lactic acid menghasilan . Decreased milk acidity causes the milk protein , namely casein , mengkoagulasi . Stater used in the manufacture of some dairy products like yoghurt consists of bacteria that ferment lactose . Lactic acid, which is produced by bacteria is the cause coagulation in yogurt (Gaman . , Et al , 1993) .

e . Flavor

Organoleptic test results yoghurt taste Moringa shows the average value of flavor yoghurt Moringa between 2.07 to 3.4 . The average value of all treatments yoghurt Moringa shown in Figure 6 .

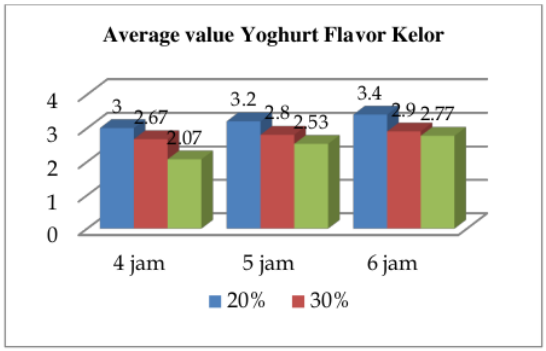

Figure 9. Value Average Flavor Yoghurt Kelor

Yoghurt taste or flavor associated with fermentation carried out by inserting certain types of bacteria . Streptoccous Thermopillus start the fermentation of lactose into lactic acid , reducing the redox potential of the product by removing oxygen and cause decomposition of milk protein melelui proteolytic enzymes work . this creates favorable conditions for the growth of Lactobacillus bulgaricus which began to develop when the pH has decreased . The typical yoghurt flavor due to the lactic acid and the remnants of acetaldehyde , diacetyl , acetic acid and volatile substances other produced by bacterial fermentation . Lactobacillus bulgaricus is the main cause of the formation of acetaldehyde . (Buckle . , Et al 2007: 295)

f . fondness

Organoleptic test results the average value of Moringa yoghurt preference level ranged from 2.5 to 3.07 . The average value of Moringa yoghurt preference level of all treatments shown in Figure 7.

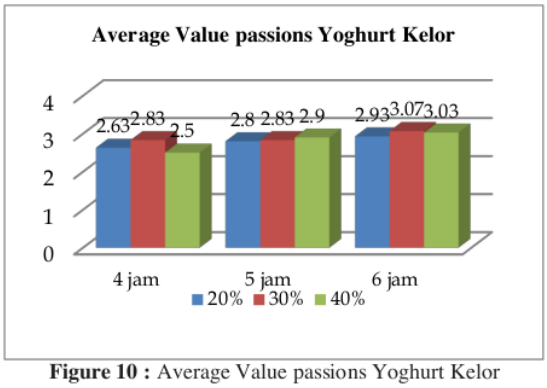

Figure 10 : Average Value passions Yoghurt Kelor

The incubation time significantly affected the favorite yogurt. The typical yoghurt flavor due to the lactic acid and the remnants of acetaldehyde, diacetyl, acetic acid and volatile substances other produced by bacterial fermentation. Lactobacillus bulgaricus is the main cause of the inception of acetaldehyde. (Buckle., Et al 2007: 295) The main factors that ultimately affect the acceptability of the yogurt. resulting flavor yoghurt appropriate and acceptable by the panelists.

The addition of moringa leaf extract 40% yield green yoghurt rather old and lumpy. The addition of moringa leaf extract 20% by value produces yogurt flavored and tasteless Moringa leaves Moringa leaves. From these explanations it can be seen that the addition of moringa leaf extract 20% and 40% both earn the same amount of comparison criteria, so it should be selected to be one of the best products. if viewed in terms of taste panelists preferred the yoghurt products with the addition of moringa moringa leaf extract 20%, because the yoghurt produced tasteless Moringa leaves. Moringa leaves have a distinctive flavor that tannin content therein. Tannins are found in

nature and is present in every part of the plant, especially in the tropical plants in the leaves and bark (Julianti 2008).

The incubation time of 6 hours produces yogurt is thick, tasteless Moringa leaves and panelists preferred. Thus it can be concluded that the best yogurt is yogurt products with the addition of moringa leaf extract 20% with a 6-hour incubation period, namely yoghurt products Moringa C or T3 K1. Yoghurt Moringa C has a light green criteria, not flavorful Moringa leaves, soft texture, thick, tasteless Moringa leaves and panelists preferred.

2. Substance Nutrient Content Test Result

Yoghurt contains moringa test results, namely: the number of lactic acid bacteria that 1,2x104CFU / ml less than the yoghurt SNI is 107 CFU / ml. this shows Moringa yogurt safe to eat. Moringa yoghurt 5.97 pH levels indicate that slightly sour yogurt.

Based on the comparison of nutrient yogurt with yohurt SNI best moringa can be concluded that Moringa yogurt has the advantage that lies in: the carbohydrates, protein, calcium, iron, vitamin A and vitamin C, so it's good to be a healthy drink.

Conclusion and suggestion

Conclusion

Based on the analysis and discussion, Effect of Addition of Moringa Leaf Extract (Moringa oleifera) and Incubation Time Against Yoghurt organoleptic properties can be summarized as follows:

1. The effect of the addition of Moringa leaf extract significantly affect the color, aroma, consistency and flavor, but did not significantly affect the texture and joy. The influence of incubation time significantly affect the viscosity, taste and preferences, but had no significant effect on the color, aroma and texture. While the interaction between the two did not significantly affect the color, aroma, texture, consistency, taste and preferences.
2. Nutrient content of Moringa best yoghurt based on the results of organoleptic test is yoghurt C with moringa leaf extract 20% and incubation time of 6 hours. Nutritional content of yogurt C as follows: carbohydrate 2.84%, 4.75% protein, fat 69.57% 3.087% Calcium, Iron 6.277% 2885 ppm vitamin A and vitamin C 14.625 ppm, Lactic Acid Bacteria (LAB) 1,2X104 and pH 5.97.
3. The selling price yoghurt Moringa leaf extract per 100 grams with the best organoleptic test result is Rp 2.500, -.

Suggestion

Suggestions can be submitted writer after doing research are:

1. It is necessary to conduct further research on the storability and packaging for yogurt products Moringa.
2. This study has a high fat content then, similar studies need to be done by using skim milk.

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