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Study of the Quality chemical of Fresh Drinks Corens with the Use of Different Types of Oranges

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Abstract : Corens is a beverage product made from young coconut water mixed with freshly squeezed orange juice. This drink is very popular at the public. The purpose of this study is to determine the nature of chemical, fresh drinks corens. The design used was Factorial Complete Random Design with 2 factors, factor A (three orange types: lime, orange kasturi, sweet orange) with 3 levels and B factor (coconut water level concentration: 100%, 90%, 80%) with 3 replication. The result of observation in the form of data was analyzed using SPSS 20 program, that is variable analysis (ANOVA) and DNMRT advanced test at 5% real level. The results showed that the nutritional value of beverage corens with the type of citrus treatment significantly affected the chemical quality of corens drinks, namely; The highest sugar content was obtained in sweet orange treatment with 100% coconut water concentration of 3.89%. The highest vitamin C was obtained in sweet orange treatment with 100% coconut water concentration of 24.05%, the highest pH was obtained in sweet orange treatment with 100% coconut water concentration of 4.84. The best chemical quality of corens beverage is obtained in sweet orange treatment with 100% coconut water concentration.
Keywords : chemical, orange, young coconut water, quality, corens.

1.Introduction

Indonesia is a major coconut producing country of 13.14% in the world. Coconut is a natural material that is easily obtained and can be pursued into materials that have a more optimal value for use. West Sumatra is the largest coconut producing area in Indonesia with an area of ± 88,825 Ha of coconut plantation, producing 355.3 million tons of coconut fruit, producing 66,362.63 tons of coconut husk per year [1]

Coconut is a versatile plant because every part of the plant is beneficial to humans, so the coconut plant is nicknamed "Tree of Life". Developing countries depend heavily on coconut crops as a source of food, beverages, building materials, homes, medicines, and handicrafts. Even coconut is also used as raw material in a number of important industries such as; Cosmetics, soaps, and others. The most valuable part of the coconut plant to date is the meat [2]

Young coconut water contains 95.5% water, 0.1% protein, less than 0.1% fat, 4.0% carbohydrate, 0.4% ash, vitamin C 2.2-3.4 mg / 100ml And vitamin B complex consisting of nicotinic acid, pantothenic acid, biotin,

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folic acid, vitamin B1, and little pyridoxine. The mineral content of coconut water consists of potassium, sodium, calcium, magnesium, iron, copper, phosphorus, sulfur, and chlorine. Mineral K content in coconut water is the highest, both in old coconut water and young coconut water. Consuming high K minerals can lower hypertension, as well as help speed up the absorption of drugs in the blood. If coconut water combined with young coconut meat will certainly provide better nutritional value, because the young coconut meat contains 15 types of amino acids, 10 of which include essential amino acids [3]

PeniT, Sulisdiana[4], says that young coconut water is part of a natural isotonic, mineral-rich, and has the same electrolyte as the body's electrolyte. Young coconut water is useful for dehydration and restore stamina because of the content of electrolytes, chloride, calcium, magnesium, sodium, and riboflavin.

Corens is a beverage product made from young coconut water added with orange juice, then added ice to the drink for its freshness. The public is more familiar with drink corens as a fresh drink because it can relieve thirst when the day is hot and to break the fast. This drink is very popular and popular by the public. This can be seen from the number of young coconut sellers, ranging from restaurants, cafes to small stalls on the street. Corens beverage quality is determined by the quality of the ingredients, especially the type and quality of the coconut, the quality of the oranges, greatly affect the quality of the corens drinks to be produced.

The types of local citrus cultivated in Indonesia are Keprok orange (*Citrus reticulata L*), orange Siem (*C. microcarpa L*) consisting of Siem Pontianak, SiemGarut, SiemLumajang, Sweet Orange (*C. auranticum L*), Lemon (*C. Medica*), Large Orange (*C.maxima Herr*), which consists of oranges Nambangan, Madium, and Bali. Orange for seasoning consisting of lime (*C. aurantifolia*), Purut oranges (*C. hystrix*), and Sambal oranges (*C. hystix*), Introduced cultivated variety varieties are varieties of Lemon and Grape fruit. While the local varieties are orange Siem, orange Baby, Keprok Medan, Bali, lime and Purut[3].

Coconut drink products 'mudo honey' is very much visited by the community both from the city of Padang and outside the city of Padang. In addition to the delicious taste in this place also available a variety of menus in between; Young coconut lime, young coconut kasturi, young orange coconut, young coconut milk honey, and others. Young coconut and orange juice is a fresh drink that can replace fluids and lost body ions so that the body will return fresh. The content of electrolytes in coconut water is similar to that in body fluids. While the function of orange juice is as a supply of vitamin C, the nutrients that are needed by the body of the virus, because its function as an antioxidant will be very effective in killing or suppressing the movement and growth of viruses in the human body [5]

Based on the description above, it is necessary to conduct research on "Study of Quality Chemical of Fresh Drinks of Corens with the Use of Different Types of Oranges" to see the magnitude of the benefits and nutritional content of the coconut drink combined with lime juice, sweet orange juice, and orange kasturi The purpose of this research are: to determine the effect of orange and coconut water concentration on the chemical of fresh drinks corens and to know the best quality fresh drinks corens.

II. Materials and Methods

Materials and tools: This research has been conducted in Kopertis Region X and Agricultural Technology Product Laboratory Andalas University of Padang, from February to March 2017. The main raw materials are young coconut water, lime, kasturi, and sweet orange obtained from young coconut drink merchant 'mudo honey' jln. Bandar Purus no. 67 Padang. The chemicals used in this analysis are Aquadest, concentrated sulfuric acid (H_2SO_4) 25%, Hydrochloric acid solution (HCl) Amylum indicator 1%, 30% KI solution, Luff school solution, Sodium thiosulfate ($Na_2S_2O_3.5H_2O$) 0.1 N , 5 ml starch solution, and Iodium buffer = 2 solution, The tools used for making this corens brew are knives, machetes, pots, PET plastic bottles, stirring spoon. The tools used for chemical analysis are a set of sugar content analysis tools, a set of vitamin C analysis tools, pH measuring instruments.

Experimental design. The experiment was conducted in a Randomized Complete Randomized Design (RAL) 3 x 3 with 3 replications [6]. The observed results were analyzed based on the F test and followed by

(DNMRT) at a real 5% level. The treatments used were: Factor A = Type of orange ; A_1 = Lime, A_2 = Citrus kasturi, A_3 = Sweet orange; Factor B = Concentration of coconut water ; B_1 = 100%, B_2 = 90%, B_3 = 80%.

Material formulation. Formulation is very important in the manufacture of fresh drinks corens. In this research the formulation used is as follows; Formulations Materials used in the manufacture of fresh beverages are presented in Table 1 below.

Table 1. Formulation of Materials Used in the Making of Fresh Drinks of Corens in 400 ml

Treatment	Raw		
	Volume orange juice (ml)	Young coconut water (ml)	Aquadest
A_1B_1	4	400	-
A_2B_1	4	400	-
A_3B_1	4	400	-
A_1B_2	4	360	40
A_2B_2	4	360	40
A_3B_2	4	360	40
A_1B_3	4	320	80
A_2B_3	4	320	80
A_3B_3	4	320	80

Implementation of Research

The research on making corens beverages includes; Preparation of ingredients, manufacture of beverage corens, chemical analysis (test of sugar content, vitamin C, pH.

a. Material Preparation. Samples are taken from where fresh young coconut drinkers are; Fresh coconut drink 'mudo honey' which is on Nmdar Purus Sreet number. 67 Padang city. Samples taken with coconut water mixed with lemon, kasturi and sweet orange.

b. Corens Drinking Material. The ingredients used are young coconut that is green colored, because the young coconut is green efficacious to neutralize toxins in the body, help heal bloody deman, help relieve nausea and others. Oranges are the ingredients that are used as a supplementary ingredient in making coconut drinks. The oranges used in making this coconut include; Lime, orange kasturi, and sweet orange because it is rich in vitamin C and make the body feel fresh.

c. Drink Process Corens. The process of stripping coconut as follows; Cut the skin/coconut top and bottom with machetes, coconut husk / skin removed until the coconut can be placed on the table and visible coconut shell. Hole the bottom coconut with the tip of the machete, so look the contents of the fruit coconut, pour the coconut water in a bowl / pan, split the coconut to take the meat kelapanya, coconut shell by using a spoon to take the meat. The next process is mixing coconut water, and the oranges are then stirred [7].

d. Chemical Analysis.

1. Sugar Levels Luff Schrool Method [8]. The sample was piped 100 ml into the erlenmeyer and added 5 ml of luff solution and 20 ml of aguades, while for the 25 ml aquadest. After which it is heated and left to boil for 10 minutes and the blank is not heated. Next Erlenmeyer is lifted and cooled to flowing water. Then add 20 ml Kl 30% and 25 ml, 25% H2S2O4. Titrate with 0.1N thiosulfate solution to a light yellow liquid color quickly add 5ml starch solution and neutralization continued until the liquid is milky white. Read thio used, determine the sugar content of the material with the following formula:

Sugar = (D-dilution) / (1000 X initial weight) X 100%
D (list luff) = ((b-a) x N tio) / 0.1
Information:
B = thio used for b
A = thio used for sample

2. Levels of Vitamin C by Titration Method [9]. Take a 25 ml sample inserted in erlemeyer. Add 5 ml of starch solution, then titrate rapidly using 0.01 N iodine solution until color change (blue) occurs.

A = ml Yod 0.01 N x 0.88 x p x 100
Example weight
Information;
P = Number of dilutions
A = m gram of vitamin C per 100 grams of material
1 mol of iod = 0.88 mg ascorbic acid

3 pH [10]. The purpose of pH measurement is to determine the degree of acidity of the corens beverage by showing the H + ions present in the cores. Determination of pH can be done by means of pH meter. How; Turn on the pH meter, leave it for a while until the needle shows a fixed number. Measure pH standard aquades (pH = 7) buffer = 2, rinse the glass rod of pH (electrode) meter with aquades, dry with clean cotton to dry and then measure the pH of the material.

Results and Discussion

1. Sugar Level Analysis. The result of the analysis of variance showed the treatment of orange type and the concentration of young coconut water significantly (P <0,05) on the sugar content of the corens drink, while the interaction of the two treatments was not significantly different. The sugar content contained in the cores drinks is presented in Table 2 below.

Table 2.Average Sugar Level Treatment Type of Citrus Beverage Corens.

Types of oranges	**Sugar levels (%)**
A_1	2,87 a
A_2	2,99 a
A_3	4,16 b
Mean	3,34
KK	16,59

The numbers followed by different letters differ significantly at the 5% level according to the DNMRT advanced test

The sugar content of corens drinks ranged from 2.87% to 4.16%. The highest sugar content was obtained in sweet orange (A_3) treatment of 4.16%. The lowest sugar content was obtained in the treatment of lime (A_1) of 2.87%. This indicates that the type of citrus that is given significant effect on sugar content of corens drinks. Based on DNMRT advanced test at 5% level showed the treatment of lime, kasturi (A_1, A_2) was significantly different with sweet orange treatment (A_3).

Table 2 shows the sugar content of corens drink increased in sweet oranges. According to [11] that sweet oranges are rich in glucoside, flavonones, pectin, and enzymes. Sweet orange pectin suitable made fresh drinks like juice. Sweet orange contains 11.0 g of carbohydrate, 0.8 g protein, and calories 44.0 cal / 100 g juice.

The lowest sugar content was obtained in the treatment of lime and kasturi. The nutritional value of lime is different from sweet orange like; Carbohydrate 10.4 g, protein 0.5 g, calories 37 cal / 100 g of fruit. Lime has the highest citric acid content among other oranges that is 7-7,6% this causes sugar content in sweet orange treatment is higher than the treatment of lime and kasturi [12].. The influence of the concentration of young coconut water on the sugar content of the corens drinks is presented in Table 3 below.

Table 3.Average Sugar Level Treatment Concentration of Coconut Water on Corens Drink.

Concentration of coconut water	Sugar level (%)
B_1	3.89 a
B_2	3.39 a
B_3	2.73 b
Mean	3,34
KK	16,59

The numbers followed by different letters differ significantly at the 5% level according to the DNMRT advanced test

Sugar content with treatment of coconut water concentration 100%, 90%, and 80% decreased from 3.89% to 2.73%. The highest sugar content was obtained at 100% (B_1) concentration of 3.89% and the lowest sugar content at 80% (B_3) concentration was 2.73%. Based on DNMRT advanced test at 5% level, each treatment of coconut water concentration gave a different effect. This shows the higher concentration of young coconut water, the higher the corensity sugar content is obtained and vice versa.

Table 3 shows the sugar content of cores drinks decreased. According to [13] coconut water has good potential to be a fresh drink, because of its nutritional content, rich in nutrients such as sugar, protein, and fat. So it is very good for the body nutrition. Young coconut water contains a number of nutrients, namely 0.2% protein, 0.15% fat, 7.27% carbohydrates, sugar, vitamins, and electrolytes. Maximum sugar content of 3 g/100 ml coconut water. The types of sugar contained are sucrose, glucose, fructose and sorbitol. The content that causes young coconut water is more sweet and fresh.

This results in the concentration of young coconut water in treatment B_1 has a high sugar content of the treatment of B_2 and B_3 because there is no addition of other ingredients that cause the sugar levels to decrease. This suggests that the higher the concentration of coconut water given the higher the sugar content obtained and vice versa, the lower the concentration of coconut water given the lower the sugar content obtained in the corens brew [14].

This is in accordance with the research [15] that, the test of sugar and vitamin C levels in the yogurt of cow milk boyolali with the addition of young coconut water and soursop extract obtained the highest sugar content in the addition of coconut water 75% A_2S_2 treatment of 29.83 mg The lowest sugar content was obtained in the treatment of A_1S_3 with the addition of 55% coconut water that is 16.00 mg. The results showed that the higher the concentration of coconut water the higher the sugar content produced in yoghurt milk cow boyolali.

2.Vitamin C. The results of the analysis of variance showed the treatment of the type of orange and the concentration of young coconut water significantly ($P < 0,05$) to vitamin C drink corens. While the interaction between the two treatments is not significantly different. The average vitamin C contained in the drink is listed in Table 4 below.

Table 4. Average Vitamin C Treatment Type of Citrus Beverage Corens

Type of Oranges	Vitamin C levels C (%)
A_1	19,12 a
A_2	18,89 b
A_3	22.57 c
Mean	20,19
KK	6,51

The numbers followed by different letters differ significantly at the 5% level according to the DNMRT advanced test

Vitamin C ranged from 19.12% to 22.57% of the highest vitamin C content obtained in sweet orange (A_3) treatment of 22.57%. The lowest vitamin C was obtained in the treatment of orange kasturi (A_2) of 18.89%.

Based on DNMRT advanced test at 5% level showed the treatment of lime, kasturi (A_1, A_2) was significantly different with sweet orange treatment (A_3).

Table 4 shows the vitamin C drinks corens increase. This indicates that the type of grapefruit given affects the value of vitamin C obtained in the corens brew. Decrease in vitamin C caused by the outside air and easy to dissolve in water depending on the state of the fruit. The older the citrus fruit, the less vitamin C content.

This is in accordance with research [16], that sweet orange has a sweet taste, a lot of water content and has a high vitamin C ranges from 27-49 mg / 100 g of fruit flesh. Vitamin C is useful as an antioxidant in the body, which can prevent cell damage due to free radical molecular activity. The effect of coconut water concentration on Vitamin C beverage is presented in Table 5 below.

Table 5. Effect of Coconut Water Concentration on Vitamin C Drink Corens

Concentration of coconut water	**Vitamin C (%)**
B_1	20,86 a
B_2	19,79 b
B_3	19,95 b
Mean	20,19
KK	6,51

The numbers followed by different letters differ significantly at the 5% level according to the DNMRT advanced test.

In table 5 the concentration of coconut water significantly (P <0,05) to vitamin C drink corens. Vitamin C values decreased from 10.27% to 8.20% of the highest vitamin C obtained at 100% concentration (B1) of 10.27%. The lowest sugar content at 80% concentration (B_3) was 8.20%. Based on DNMRT advanced test at 5% level showed the treatment of lime, kasturi (A_1, A_2) was significantly different with sweet orange treatment (A_3).

In Table 5 shows vitamin C drink corens with coconut water concentration treatment decreased. This suggests that the higher the concentration of coconut water is given the higher the vitamin C levels are obtained and vice versa, the lower the concentration of coconut water given, the lower the vitamin C content obtained in the corensated drink.

This is in accordance with the research [15], vitamin C test in yoghurt milk cow boyolali with the addition of young coconut water (*Cocos nucifera*) and soursop extract (*Annonna muricata*) The results showed that the more concentration of fruit juice extracts the higher Vitamin C content produced in milk yoghurt cow boyolali. According to [17], based on the results of coconut water analysis turned out, in addition to having the benefits of coconut water productivity also has a high vitamin C content of 10.12 mg as. Askorbat/100 g material. Based on the benefits of young coconut water can be processed into soft drinks, soy sauce, jelly, yeast, alcohol, and nata de coco.

Decreased vitamin C is caused by the concentration of coconut water is different. Because vitamin C is easily soluble in water, therefore at the time of processing of materials containing vitamin C will decrease levels. The content of vitamin C in fruits and foods will be damaged by external air oxidation process, especially if heated by using iodimetry method [18]

3.PH. pH is one of the important parameters to be measured as it relates to the quality of a food product. Significant changes in pH value can alter the taste of a food product. Products with low acidity generally tend to be more durable because microbes will be difficult to grow on medium with high acidity [19] .

The results of the analysis of variance treatment of orange type and the concentration of young coconut water significantly (P <0.05) on pH beverage corens. While the interaction between the two treatments was not significantly different pH of the corens drinks presented in Table 6 below.

Table 6. Effect of Orange Type on pH Beverage Corens

Type of oranges	**pH**
A_1	3.14 a
A_2	3.75 b
A_3	4.74 c
Mean	3,87
KK	5,09

The numbers followed by different letters differ significantly at the 5% level according to the DNMRT advanced test.

In table 6, orange type treatment had significant effect (P <0,05) to pH of corens drink. The pH value of orange type treatment ranged from 3.14 to 4.74. The highest pH obtained in sweet orange (A_3) treatment of 4.74 pH was obtained at the lowest treatment of lemon (A_2) of 3.14. Based on further test DNMRT at 5% level indicates orange type treatment significantly.

In table 6 shows the pH value increased by the type of orange treatment. This indicates that the type of citrus given influences the pH of the corens drink, the highest pH value obtained in the sweet orange treatment in this treatment of sugar and vitamin C levels is also increased due to the chemical content contained in the sweet orange such as; Carbohydrates, fatty proteins, and sugars higher in comparison with lime and kasturi. In the treatment of lime and kasturi low pH sugar and vitamin C levels decreased.

According to [20], that orange extract having different pH value was able to conduct different electric current, from experimental results obtained data, the lower the pH (strong acid) then The longer the polarization time, the higher the pH (weak acid) the faster the polarization occurs. This is related to the acidic solution (low pH), the concentration of H^+ ions increases and these ions can react with the OH^- ions formed on the cathode and give a depolarization effect. The effect of coconut water concentration on the pH of the corens drinks is presented in Table 7 below.

Table 7.Effect of Coconut Water Concentration on pH Beverage Corens.

Concentration of coconut water	**pH**
B_1	3.95 a
B_2	3.86 b
B_3	3.82 b
Mean	3,87
KK	4,09

The numbers followed by different letters differ significantly at the 5% level according to the DNMRT advanced test.

In table 7 the highest pH was obtained at the concentration of 100% coconut water (B1) at the lowest 3.95 pH obtained at 80% treatment (B3) coconut water concentration of 3.82. Based on DNMRT further tests at 5% level showed the treatment of coconut water concentration significantly different.

In table 7 shows the pH value decreased with the treatment of young coconut water concentration. In the treatment of coconut water concentration pH decreased levels of sugar and vitamin C also decreased. This is caused by the different concentrations of coconut water in the corens brew

This is consistent with the research [21] on the effect of young coconut water concentration on growth of Saccharomyces cereviceae showing the result of pH analysis of medium before yeast was found that coconut water concentration treatment gave very significant effect to the magnitude of pH of medium Saccharomyces cereviceae. L. Effect of coconut water concentration on pH medium before given yeast was known average of lowest pH 5,30ie at treatment E with 100% coconut water concentration. This is because the pH of coconut water is acidic. In general the pH of coconut water is about 5.60 (acid). Different concentrations of coconut water affect the growth of Saccharomyces cereviceae. L, of all treatment, E treatment with 100% coconut water

concentration showed the most cell growth followed by treatment of D 75%, C treatment 50%, Treatment B 25% and Treatment A without coconut water.

Conclusions

The results showed that the chemical content of corensated beverages with the treatment of oranges (lime, kasturi, sweet) and coconut water concentration (100%, 90%, 80%), obtained a sugar content of 2.03 to 3.89%. Vitamin C of 18.54 to 24.05%, pH ranged from 3.11 to 4.83.The best quality of corensed beverage obtained in sweet orange treatment with 100% coconut water concentration.

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