

## LONGAN COFFEE MADE OF LONGAN FRUIT SEED WASTE FROM BOROBUDUR

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### **ABSTRAK**

*The purpose is Utilizing the longan seeds be raw material of coffee drinks and finding the similarities to the regular coffee drinks. History records that the discovery of coffee as a nutritious and energized drink was first discovered by the Ethiopians in the African continent about 3000 years (1000 BC) ago. Coffee then continues to grow until now became one of the most popular drinks in the world consumed by various circles of Indonesia itself and it has been able to produce more than 400 thousand tons of coffee per year. Place and Time of study Venue: Science Laboratory, SMA Negeri 1 Grabag. Time: September-October 2017. Research Procedures. The method used in this study is to use the method of Experiment and Interview / Questionnaire. The experimental stages are: 1. Experiment I 2. Experiment II Organoleptic Test Seed waste can be processed into coffee with low caffeine content and rich in antioxidants. From the results of organoleptic test, this coffee is resemble to arabica and robusta coffee. So that the waste seed of longan can be processed into a more useful product that is Longan Coffee.*

*Keyword: Longan Coffee, Borobudur, and material coffee drink.*

## **INTRODUCTION**

In the area of Borobudur, Magelang Regency, Central Java, it is being encouraged by the Regent of Magelang on the production of fruit commodities especially longan (*kelengkeng*). This is done for the creation of longan as the identity of Magelang regency. This is the source of seeds and longan for its kind. Despite of having been exposed to a kind of likes, such as direct consumption, made sweets, essence juice, there is still a hard to decompose twisted seeds. Longan seed contains a variety of nutrients and minerals that are healthful.

In addition, Indonesia is one country with consumption of high coffee drinks and it continues to increase. Deputy Chairman of the Indonesian Coffee Exporters Association (AEKI) Moelyono Soesilo stated, "Indonesian coffee consumption will increase from 15% to 25% by 2020. The trend of increasing coffee consumption has not been matched by an increase in domestic coffee

production. In Indonesia, the consumption level of coffee is about 4-5 million bags per year, or about 300,000 tons. Of the 300,000 tons of coffee consumed by the Indonesian community, only about 40% of it comes from processed Indonesian coffee. "This proves that even though Indonesia is a country with abundant natural resources, even dubbed as an agrarian country, the need of domestic coffee beans is still far from sufficient, it is importing from another country.

Today, coffee drinks have captivated almost anyone who has felt it. However, not everyone may consume it for health reasons. The current coffee drink comes from a coffee plant bean that contains a fairly high caffeine compound. As heart patients, hypertension, and ulcers are not advised to consume coffee because it can worsen the effects of caffeine that can accelerate heart rate and irritate the stomach

From the above explanation, that now Indonesia is still short of supply of raw materials of coffee drinks and the current coffee beverage needs to be alternative raw

materials such as longan seed which has the safe content.

Therefore, we want to make coffee drinks which are made from longan seeds. Thus the researchers took the title of the study "Coffee of Longan Seeds (*Dimocarpus longan*)" Utilizing the longan seeds be raw material of coffee drinks and finding the similarities to the regular coffee drinks.

**Longan**

Longan (also called *kelengkeng*, *matakucing*, longan, *Dimocarpus longan*, *lerak-lerakan* or Sapindaceae) is a fruit plant originating from mainland Southeast Asia. The longan tree can reach 40 m high and stem diameter up to about 1 m. Leaf compound, with 2-4 (-6) pairs of leaflets, mostly feathered tightly on the axial part. Leaf stalk 1-20 cm, 0,5-3,5 cm leaflets. Child round leaf lengthwise, long lk. 1-5 times the width, varying from 3 to 45 × 1.5-20 cm, pressing to warm, with feathers especially on the bottom near the leaf repeating. Inflorescence is generally at the end (flos terminalis), 4-80 cm long, bushy with feathers, umbrella shapes menggarpu. Crown flower five strands, length up to 6 mm. Fruit round, yellowish brown, almost bald; slippery, grainy, coarse or rasp berber, depending on the species. Fleshy flesh (arilus) thin white and slightly clear. The seed wrap is dark brown, shiny. Sometimes it smells a bit hard

Table 1 Nutritional Content of Longan - Longan per 100 gram:

• 60 kcal calories	• Vitamin C 84 mg
• 15 grams of carbohydrates	• Calcium 1 mg
• 1.3 grams of protein	• Iron 0.13 mg
• 1.1 grams of fiber	• Manganese 0.05 mg
• 83 grams of water	• Magnesium 10 mg
• Vitamin B1 (Thiamine) 0.031 mg	• Phosphorus 21 mg
• Vitamin B2 (riboflavin) 0.14 mg	• Potassium 266 mg
	• Zinc 0.05 mg

• Vitamin B3 (Niacin) 0.3 mg	
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**Coffee Drinks**

Coffee is a beverage that has been roasted coffee beans and mashed into powder. Coffee is one of the world's commodities that are cultivated more than 50 countries. Two common coffee tree varieties are Robusta Coffee (*Coffea canephora*) and Arabica Coffee (*Coffea arabica*).

The processing of coffee before it can be drunk through a long process that is from the harvesting of coffee beans that have been cooked either by machine or by hand then done the processing of coffee beans and drying before it becomes coffee. The next process is frying without oil (*penyangraian*). After that, coffee beans milled or smoothed into a coffee powder before the coffee can be drunk.

History records that the discovery of coffee as a nutritious and energized drink was first discovered by the Ethiopians in the African continent about 3000 years (1000 BC) ago. Coffee then continues to grow until now became one of the most popular drinks in the world consumed by various circles of Indonesia itself and it has been able to produce more than 400 thousand tons of coffee per year.

**RESEARCH METHOD**

**Place and Time of study**

Venue: Science Laboratory, SMA Negeri 1 Grabag

Time: September-October 2017

**Research Procedures**

The method used in this study is to use the method of Experiment and Interview / Questionnaire.

The experimental stages are:

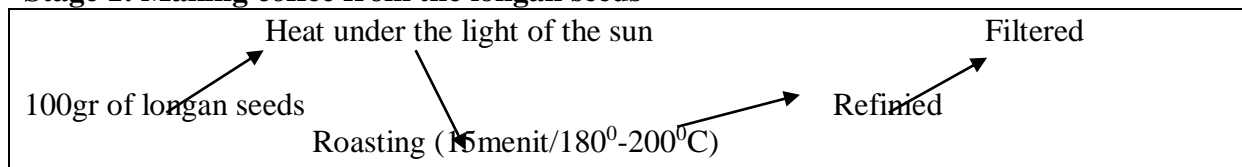
1. Experiment I
2. Experiment II Organoleptic Test

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**Tools and Materials:**

Tool:	Material :
1. Oven	1. Longan
2. Mixers	Seeds
3. Blander	
4. Sievers / filters	
5. Sighting	

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**Stage 1: Making coffee from the longan seeds**


**Stage 2: By testing the chemical content of longan coffee seeds**

**Stage 3: By comparing through the test respondents between 6 samples of longan coffee seeds**

**Stage 4: By comparing the best samples of longan coffee seeds, *robusta* and *arabica* coffeee.**

2. Prepare 6 samples of longan seeds with the weight of each sample is 100gr. 5 samples are

Longan seeds with their skin and one other sample without skin.

3. Dry 5 samples of longan seeds with a period of 0 hours, 6 hours, 12 hours, 18 hours, 24 hours and 1 other sample for 24 hours.

**Roasting Longan Seeds**

Bake each sample of long seeds for 15 minutes with temperature of 180<sup>0</sup>-200<sup>0</sup>C

**Finishing of Longan Seeds**

1. Place seeds that have been roasted in the mortal and then puree into powder.

2. In order to get a smooth result, and filter the results.

**ANALYSIS AND DISCUSSION**
**Experimental Activities**
**Experiments**
**Drying of Longan Seeds**

1. Wash the longan seeds. Perform 2 washes.

Table 1. Production of Longan Seed Coffee

Sampel ke-...	The weight of Longan Seed (g ram)	Drying Time (jam)	Weight After Drying (gram)	Weight Baked (15menit/180 <sup>0</sup> -200 <sup>0</sup> C)	After Powder Weight
1	100 →	0	100	96	60
2	100 →	6	95	90	55
3	100 →	12	90	87	50
4	100 →	18	87	85	50
5	100 →	24	85	82	40
6	100 → (without cover)	24	80	75	75

## Result

### Chemical Analysis

**Table 2. Chemical Analysis of Longan Coffee**

No.	Analysis	Unit	Amount
1	Water	%	3.7961
2	Ash	%	3.45
3	Fat	g	0.1
4	Protein	g	1

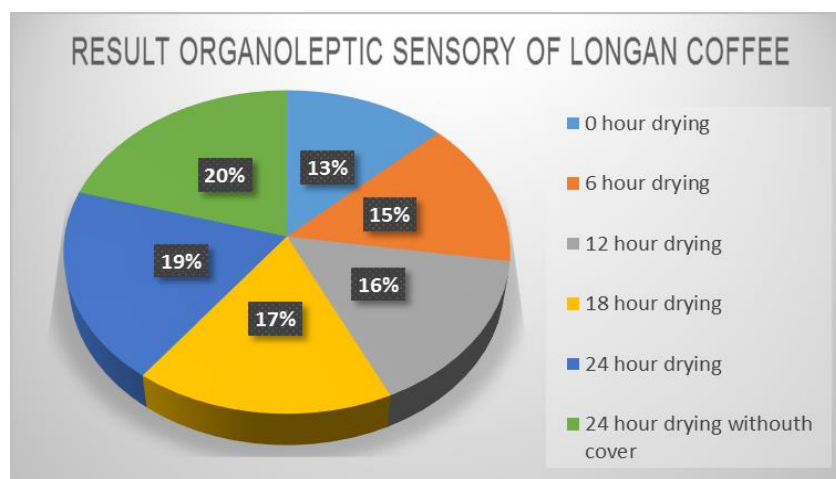
5	Carbohidrat	g	15.8
6	Caffeine	%bb	0.371
7	Phosphor	mg	42
8	Zinc	mg	1,2
9	Asorbid acid	mg	6

### Organoleptic Sensory Evaluation

It was Tried to 30 people with an average age of 14-60 years old.

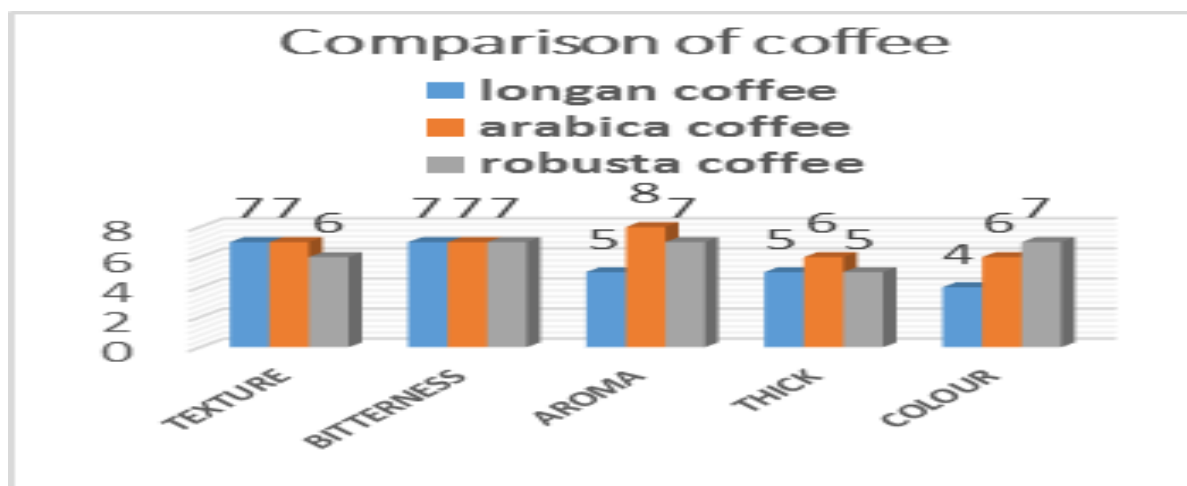
**Table 3. Sensory evaluation of texture, biterness, aroma, thick, and colour of Longan coffee**

VARIABLES	TEXTURE	BITTERNESSES	AROMA	THICK	COLOUR	AVERAGE
0 hour drying	7	8	4	3	2	4,8
6 hour drying	3	6	4	6	8	5,4
12 hour drying	5	6	6	5	7	5,8
18 hour drying	7	6	6	5	8	6,4
24 hour drying	8	7	8	5	8	7,2
24 hour drying with cover	9	8	8	6	7	7,6



**Table 4. Comparison of the best coffee stamps with arabica coffee and robusta coffee.**

TEXTURE	BITTERNESSES	AROMA	THICK	COLOUR
7	7	5	5	4
7	7	8	6	6
6	7	7	5	7



From the data above Longan Coffee with the best sample is 24 hours drying without cover, has texture, bitterness, aroma, thick, and colour resembles Arabica Coffee and Robusta Coffee.

#### Analysis Data

In the first experiment we were doing drying for 6-24 hours. In the second experiment we performed a 15 minute oven with a temperature of 180<sup>0</sup>-200<sup>0</sup>C. In the third experiment we refined the coffee and then filtered. In the fourth experiment we performed an organoleptic sensory of 6 sample Longan Coffee to 30 people aged 15-60 years. In the fifth experiment we tested the chemical analysis of Longan Coffee. In the sixth experiment we performed organoleptic sensory of longan coffee compared to arabica coffee and robusta coffee.

#### Discussion

Seedling of this seed is aimed to be more surface area of the seeds that heated so that the drying process can run faster. The drying process aims to reduce the water content in the seeds so that the water content in Longan Caffee is low. In addition, the decrease in water content aims to inhibit the growth of microorganisms so that more durable. In addition, to facilitate the screening process.

The roasting process is the most important process in coffee making in the past and elsewhere, because in this process there is the formation of flavor, aroma, and

color. The roasting process is done at a temperature of 180<sup>0</sup>-200<sup>0</sup>C, because at this temperature will produce coffee with high quality.

Roasting is the key of the coffee production process. This process is the formation stage of the odor and taste of coffee from the seeds. The results of this roaster also facilitate the grind in order to obtain a finer powder and easily made in the form of infusion solutions. During the roasting process, there are three stages of physical and chemical reactions that run sequentially, ie the evaporation of water from the seeds, the evaporation of volatile compounds, as well as pyrolysis or browning seeds. Roasted process begins with the evaporation of water contained in the seeds by utilizing the available heat, followed by pyrolysis reaction and Maillard reaction also occurs. These reactions cause the aroma of the coffee.

Pyrolysis is a decomposition reaction of a hydrocarbon-producing compound such as carbohydrates and cellulose as a result of heating. Generally these reactions occur pasa tempratur above 180oC. Physically change the color to black-brown. During the roasting process, the physical shape and chemical content of the seeds of longan is changed due to mass loss.

Based on Table 2, the water content in Longan coffee is in SNI standard of the quality of powdered coffee, as well as the ash content. The caffeine content in Longan coffee is low. This is compared

with SNI requirements regarding the quality of coffee powder which does not exceed 2%. This low caffeine content will certainly reduce the impact of excessive caffeine consumption from regular coffee. This is because the consumption of caffeine per day for adults has its own limit [5]. In addition, the content of mineral in Longan coffee is too high. The content of these minerals such as zinc, phosphorus and ascorbic acid compounds will be beneficial to health.

Based on table 3, Longan coffee has texture, bitterness, aroma, thick, and colour that is almost the same as arabica and robusta coffee. This indicates that respondents coffee lovers feel the texture, bitterness, aroma, thick, and colour which is almost the same between Longan coffee than Arabica and robusta coffee. This means longan fruit seed waste that has been processed into Longan coffee has a use value and have content that is also beneficial to health, such as with low caffeine and rich in minerals.

## CONCLUSION

Seed waste can be processed into coffee with low caffeine content and rich in antioxidants. From the results of organoleptic test, this coffee is resemble to arabica and robusta coffee. So that the waste seed of longan can be processed into a more useful product that is Longan Coffee

## SUGGESTIONS

1. It is better for drying the longan seeds longer ie at least 2 days is enough. However, it would be better to exceed 2 days to be more durable in storage.
2. Suggestions from Researchers that this coffee can be patented seeds, mass produced, and can be disseminated throughout the people of Indonesia and the processes of making this is very simple and the material is very easy to obtain. Coffee of longan seeds is quite effective to

utilize waste and trash the income of the community

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