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# Quality of Coffee (*Coffea Sp*) in Some Different Geographic Indications

Kualitas Kopi (Coffea Sp) di Beberapa Indikasi Geografis yang Berbeda

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***ABSTRACT***

*This study aims to determine the quality of coffee in several different geographical indications. This research was conducted at the Laboratory of the Faculty of Agriculture, University of Muhammadiyah South Tapanuli with a sampling method, namely sampling technique from 3 geographically indicated locations of coffee, namely Lintong Arabica Coffee, Mandailing Arabica Coffee and Sipirok Arabica Coffee. Observation parameters were altitude, water content, seed size and acidity (pH). Data analysis was carried out by analyzing the process hierarchy, correlation and concluded by descriptive method. Coffee quality is influenced by geographical indications, namely altitude. The highest water content is Mandailing Arabica Coffee and the lowest is Sipirok Arabica Coffee. The best bean size is Mandailing Arabica Coffee which has the highest size and the highest coffee acidity is Sipirok Arabica Coffee and the lowest is Lintong Arabica Coffee.*

***Keywords:*** *Coffee, Quality, Geographical Indications*

## INTRODUCTION

Indonesia is located at the equator with coordinates 6° N – 11° South Latitude and 95° East Longitude – 141° East Longitude. The geographical location of the State of Indonesia is one of the factors that makes this country has a promising potential in the field of agriculture. With a wide variety of agricultural crops, including coffee.

Coffee is known as a beverage commodity that is most familiar to people of all walks of life. In fact, every house always provides coffee for daily beverage needs. Coffee can be served as a delicious drink in a variety of settings. The specific aroma of coffee arouses the appetite to drink it as a body and mind refresher.

Even though Indonesia's production volume is large, the export value of coffee from Indonesia is smaller than that of Brazil, Vietnam and Colombia. In the world market, Indonesian commodities are known as *specialty coffee* through various variants of coffee and civet coffee. With the unique taste and aroma of coffee from Indonesia, Indonesia has a great opportunity to increase its coffee trade in the world (Ministry of Trade, 2016a).

Erin Alawiah Siregar, 2019:2 in his research explains that Indonesian coffee is in great demand in the international market, especially Sumatran Mandailing coffee. Mandailing Sumatran coffee has been exported to South Korea with the trademark *Arabica Mandheling*.

In terms of increasing Indonesian coffee exports in the world market, one aspect that must be considered is the quality of the coffee itself. According to Saepudin (2005) in the Journal of Nur Al-Qadri et al. 2017, the taste test is very important to determine the quality of Arabica coffee. In determining the value of coffee, producers do not only determine the physical appearance, but also determine the tasteThe determination of the coffee taste test is to assess 10 parameters based on SCAA on the taste of coffee and the presence or absence of taste defects from a sample of coffee. The AHP method can produce an output in the form of a ranking that is calculated based on

the input and the weight value where the weight value can be adjusted according to determining the criteria to be applied.

The result of the research is an application that can determine the quality of coffee beans by inputting water content, seed defects, and land height using the AHP (*Analytical Heirarchy Process*) method. The character of the quality of coffee beans comes from inherited genetic traits, especially the character of the size of the beans and the standard of the drink, which is represented by taste, acidity, and *body.* The quality of coffee taste can be influenced by the type of bean, growing area, and the cultivation process (Lambot et al., 2017).

Indonesia International Trading 2018 mentions generally, higher elevations give the coffee bean a more distinctive taste and character. Coffee grown at higher altitudes has lower air pressure and requires longer time to harvest. This has a positive impact on the taste and character of the coffee. Coffee grown in the highlands provides a unique taste such as fruity, floral and spicy. However, the coffee still has to go through a fairly long process such as the post-harvest process, the roasting phase and the brewing process, and all of these stages are equally responsible for shaping the taste and character of the coffee that is drunk.

Yusianto, 2014 explained that coffee as a refreshing drink has a very distinctive taste and has been in demand throughout the world. Coffee taste is strongly influenced by variety, agroecology, altitude where it grows, harvest time, picking method, processing method and storage method. The formation of coffee flavor is influenced by the variety and altitude where it is grown.

Based on the background of the problem above, to meet the need for information about coffee quality and to examine how the quality of coffee is from several geographical indications, it is necessary to conduct research on how the quality of coffee is in several different geographical indications.

## MATERIALS AND METHODS

Locations used as geographical indications in this study are Sipirok Arabica Coffee, Mandailing geographical indications are Mandailing Arabica Coffee and Humbang Hasundutan geographical indications are Lintong Arabica Coffee. Each sample was taken to the Laboratory of the Faculty of Agriculture, University of Muhammadiyah Tapanuli Selatan for observation and research data collection.

This research was carried out from May to July 2021 at the Laboratory of the Faculty of Agriculture, University of Muhammadiyah Tapanui Selatan.measure the acidity level of coffee. The tools used in this study were a pH meter used to measure the acidity level of coffee, measuring cups, measuring spoons, buckets, knives, plastic bags, plastic samples, stationery, digital scales, machetes, digital cameras, ovens, coffee screen graders, GPS (Global Position System), and paper labels.

Data Collection Techniques, namely Primary Data obtained by collecting data sourced from coffee owners and searching directly in the field or the original source to determine the research sample. The criteria for the plants to be sampled are coffee plants that have entered the generative phase and are in accordance with the observation parameters to be studied. Coffee plantations that are used as samples are coffee plantations that are treated according to standard care, namely pruning, fertilization and sanitation or cleaning of coffee cultivation land.

This research was conducted by applying the survey method, namely by carrying out a document study (*documentary study*), interviews (*interview*) and direct observation (*observation*) in the field. Technique for determining the sample plants is done randomly (*porposive sampling*. Observation parameters, namely the altitude of the location of the plant coordinates with GPS (Global Positioning System). Moisture Content The water content is measured by measuring the coffee beans after harvesting by weighing the wet weight and dry weight after being in the oven. Acidity (pH) measurement was carried out using a pH meter. A total of 5 grams of coffee samples that have been mashed, added with 50 ml of distilled water, and stirred until

homogeneous. The pH value is measured by placing the pH-meter electrode on the diluted sample Data Analysis by AHP (*Analytical Heirarchy Process*) Method and Correlation.

## RESULTS AND DISCUSSION

It can be seen in Table 1 that the geographical indication of the research sample is the altitude where Lintong Arabica coffee grows is 1000-1500 mdpl, the altitude where Sipirok Arabica coffee grows is 900-1800 mdpl and the altitude is 900-1800 mdpl Mandailing Arabica Coffee is 900-1400 masl.

Altitude has an effect on air temperature and rainfall (Ping *et al*. 2013). The higher the place, the lower the air temperature and the higher the rainfall and the more fertile the soil (Sari et al 2013).

Table 1. Altitude of Place Based on Geographical Indication

| No | Name of Coffee | Altitude of Place |
|---|---|---|
| 1 | Lintong Arabica Coffee | 1000-1500 mdpl |
| 2 | Coffee Sipirok Arabica | 900-1985 masl |
| 3 | Mandailing Arabica Coffee | 900-1400 masl |

There are 3 (three) soil types in Lintong Nihuta District, namely: Entisol and Inceptisol for mineral soil and Histosol (peat) for organic soil. According to the literature Damanik *et al.* (2010), on Entisol soil the soil reaction ranges from acid to slightly acidic. On the other hand, Inceptisol soils have an acidic to slightly acidic reaction (pH 4.6-5.5) and slightly acidic to neutral (pH 5.6-6.8). So with the ideal altitude for coffee, the fertile soil for the growth of Arabica coffee in the Lintong Nihuta area is very suitable for Arabica coffee cultivation.

Table 2. Wet Moisture Content and Dry Moisture Content

| No. | Name of Coffee | Weight (g) | Wet Moisture Content (%) | Dry Moisture Content (%) |
|---|---|---|---|---|
| 1 | Lintong Arabica Coffee | 877.1 | 12.29 | 14.01 |
| 2 | Mandailing Arabica Coffee | 853.6 | 14.64 | 17.15 |
| 3 | Sipirok Arabica Coffee | 905.5 | 9.45 | 10.43 |

From Figure 1, it can be seen that the highest wet moisture content is Mandailing Arabica Coffee (14.64%) and the lowest is Sipirok Arabica Coffee (9.45%). It was also obtained that the highest dry moisture content was in Mandailing Arabica Coffee (17.15%), the lowest was Sipirok Arabica Coffee (10.43%).

Based on the Hierarchical Analysis of Coffee Quality Geographical indications of Lintong Arabica coffee include water content reaching 12.29%, one of which is influenced by the height of the coffee place. Nur Al Qadri et al, 2017 that the higher the moisture content of the material, the higher the place where the variety is planted, the lower the value of the water content that will be produced is influenced by the harvest and post-harvest processes. Different at each altitude where it grows in order to get the best quality and taste. The moisture content of Arabica coffee beans is influenced by the

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relative humidity and temperature of the surroundings. The moisture content of Mandailing Arabica coffee is also influenced by the altitude of the research sample.

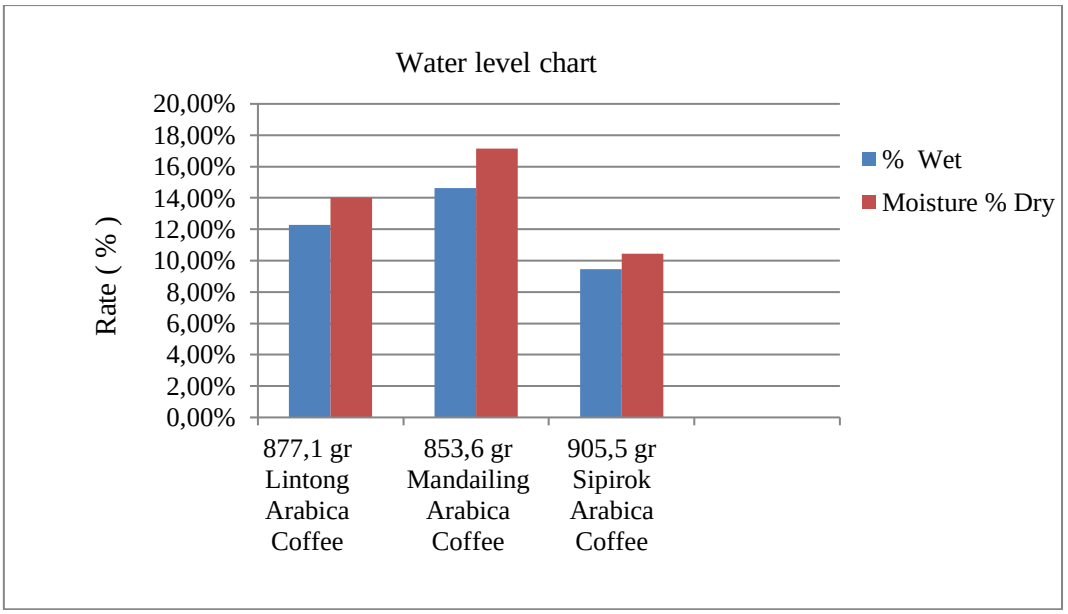


Figure 1. Water level chart

Where in this research sample, Mandailing Arabica coffee beans have larger beans than other coffee beans, namely from 1000 grams, 805.7 grams of coffee beans measuring 7 mm. This causes the water content of the Mandailing Arabica coffee beans to be higher and the drying process that is still varied makes the water content of this research coffee different.

According to Mulato (2002), the difference in the size of the coffee beans will affect the water content contained in the coffee beans. In addition, this phenomenon is related to the size and number of constituent cells in the coffee bean. As with other coffees, the moisture content of Sipirok Arabica coffee beans is also affected by altitude, but due to the relatively small size of the beans, the moisture content of Sipirok Arabica coffee is low.

From Figure 2, it can be seen that the lowest acidity is in Lintong Arabica coffee which is 6.6 and the highest acidity is in Coffee Arabica Sipirok, namely 4. Acidity or pH of Lintong Arabica coffee powder has a low acidity level of 6.6 which is very safe for human consumption.

The pH value of coffee grounds is influenced by post-harvest processes such as the size of the roasting temperature, the type of roaster, the cooking method and the fermentation of the beans before cooking. The acidity of the product is affected by the degradation of sugars in the seeds into organic acids during fermentation. (Mukhammad Fauzi et al, 2018). The longer the fermentation, the lower the pH. The decrease in pH during fermentation is influenced by microbial activity during fermentation.

Table. 3 Acidity or pH Measurement Data

| No | Coffee Name | Total pH |
|---|---|---|
| 1 | Mandailing Arabica Coffee | 5.3 |
| 2 | Sipirok Arabica Coffee | 4.9 |

| | | |
|---|---|---|
| 3 | Lintong Arabica Coffee | 6.6 |

The sample pH of Mandailing Arabica Coffee powder in this study was Banamon Coffea Premium with medium roasting. Acidity or pH of Mandailing Arabica Coffee Powder obtained in this study was 5.3. This acidity is a low acidity and is still good for consumption. In terms of choosing coffee grounds, consumer preferences differ from one another, Elna FL, 2019 in his research that Mandailing coffee which is the consumer's preference is pungent aroma with low acidity.

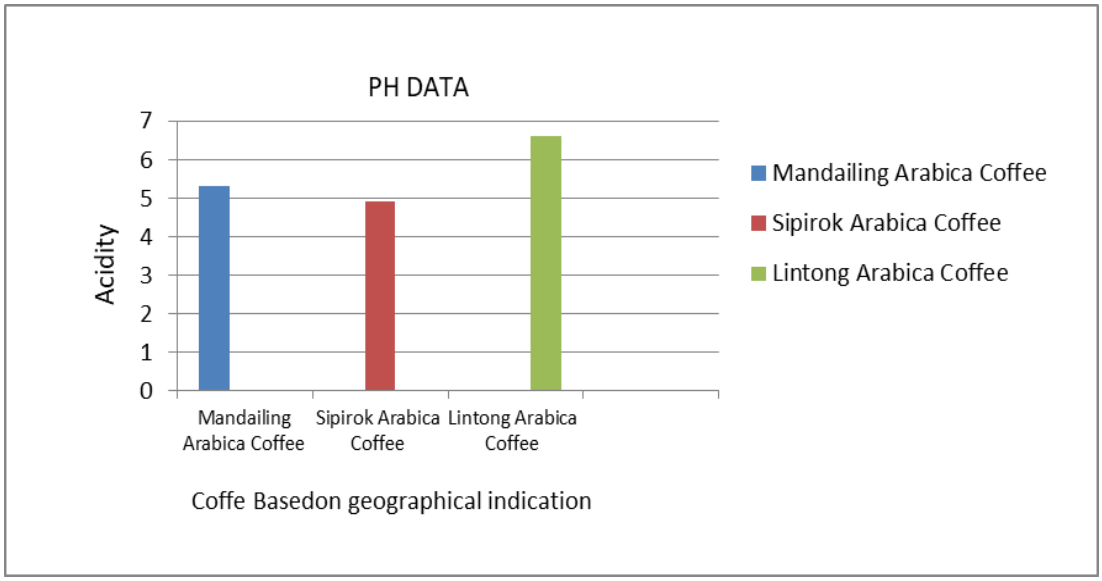


Figure 2. Acidity (pH)

Acidity or pH of Sipirok Arabica Coffee Powder has a high acidity level of 4.9 but is still in a safe level for consumption. Besides being influenced by the post-harvest process as described previously, the pH value is also influenced by the location or place of plant growth. Based on the results of the correlation analysis, the pH of coffee was significantly correlated with the height of the place where it was grown, namely 0.982. Where it is concluded that the higher the place to grow, the lower the pH of the coffee grounds. The higher the place, the more fertile the soil so that the coffee production process is high, fruit ripening and bean size are better, this is also influenced by the harvesting and post-harvesting process. The highest wet moisture content of Arabica Coffee is Mandailing Arabica Coffee, which is 14.64% and the lowest is Sipirok Arabica Coffee, which is 9.45%. Quality Standards for Arabica Coffee, the water content of good coffee for storage is 9-12.5%.

## CONCLUSIONS

Coffee quality parameters are influenced by geographical indications and are significantly correlated. Where the higher the place, the higher the water content of the beans, this is also influenced by the method of drying the coffee beans.

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