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CONSUMER PREFERENCE LEVEL ANALYSIS TOWARDS ARABICA CASCARA COFFEE (COFFEE SKIN) PRODUCTS WITH REGULAR ARABICA COFFEE

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Abstract. In general, people are quite familiar with the types or varieties of Arabica coffee. However, the majority of customers only consume Arabica coffee that we usually find them on the market, namely coffee beans. However, many do not know that Arabica coffee has waste from the peeling process (depulping) which turns out to have many benefits. The objectives that researchers want to achieve include determining the level of consumer preference for "cascara Arabica" coffee products with "regular Arabica" coffee in terms of aroma, acidity, weight, taste, aftertaste, and sweetness. The type of research used in this study is included in the experimental method, and the data analysis technique used in this study is hedonic test analysis using a Likert scale. In this study, it can be concluded that "regular Arabica" coffee is more in demand by consumers because it has more prominent advantages in 5 indicators, namely in the aroma, acidity, weight, taste, and aftertaste indicators. While "cascara Arabica" coffee only has advantages in 1 indicator, namely the sweetness indicator. The most distinguishing factor between these two products is that “cascara Arabica” coffee comes from dried coffee fruit skin, while “regular Arabica” coffee comes from coffee beans that are dried and then roasted.

Keywords: Kopi Cascara Arabika, Kopi Arabika, Uji Hedonik, Skala Likert

RESEARCH BACKGROUND

Coffee has long been a popular drink in the world with undeniable popularity. As stated by (Naeli Farhaty & Muchtaridi, 2016:214), coffee has a distinctive taste in the form of bitterness, acidity, and various aromas that distinguish it from other drinks. The culture of drinking coffee itself has been a popular phenomenon since the 9th century, although according to (Solikatun et al., 2015:61), this culture has undergone significant shifts over time. Coffee contains psychotropic substances in the form of caffeine which have the effect of eliminating drowsiness, increasing mental awareness, focus, and response, and keeping the body awake with increased energy.

Coffee entered to Indonesia during the Dutch colonial period in the 16th century. According to (Gumulya & Helmi, 2017:153), the coffee plants were brought by the Dutch and it made one of the main coffee producing countries in the world to this day. (Nugroho & Sebatubun, 2020:1) stated that coffee has two main varieties, namely Robusta and Arabica, with various types based on the region of origin or known as single origin. Although Arabica coffee is quite well known to the public, most people only consume products from its beans without realizing the potential waste from the processing process.

Arabica coffee processing waste, known as cascara, has many benefits. (Garis et al., 2019:279) confirm that cascara is dried coffee skin waste, which is generally only used as animal feed, fertilizer, or even thrown away. In fact, cascara can be reused into valuable consumer products, such as Arabica cascara coffee which is the focus of this study.

This study aims to create a cascara Arabica coffee product that can be enjoyed by coffee lovers with low caffeine tolerance levels. (Ilham et al., 2019:433) arque that caffeine in coffee can accelerate the formation of stomach acid which causes excess gas production and a bloated sensation. Thus, this study will analyze the level of consumer preference for the quality of Arabica cascara coffee products compared to ordinary Arabica coffee from various aspects such as aroma, acidity, weight, taste, aftertaste, and sweetness using the French press brewing method.

The benefits of this study include theoretical and practical aspects. Theoretically, this study is expected to be a reference for further research in the development of the Food & Beverage industry, a reference in discussing topics around coffee, and library materials on the analysis of consumer preference levels for the quality of Arabica cascara coffee. Practically, this study is expected to provide new knowledge for coffee lovers about the utilization of processing waste, useful information for sales strategies and coffee industry innovations, and alternative solutions for coffee lovers with low caffeine tolerance.

REVIEW OF RELATED LITERATURE

Coffee: History, Varieties, and Innovation of Cascara

Coffee has become world-famous drink with a very long history. According to (Afriliana, 2018:1), the origin of the coffee plant comes from Abyssinia, an area in Africa where it now includes Ethiopia and Eritrea. Coffee became a commercial commodity after being brought by Arab traders to Yemen and was popular as a refreshing drink. The history of coffee in Indonesia began in 1696 when the Dutch brought coffee from Malabar, India to Java. Indonesia then developed into the world's leading coffee exporter, ranking fourth in the 2005-2008 period with an average contribution of 4.76%. Community coffee plays an important role in Indonesian coffee, considering that 93% of coffee production is community coffee, although the management conditions are still less good compared to the State Large Plantations.

Coffee varieties are generally divided into two types, namely Robusta and Arabica. These two varieties have differences in taste and pH acidity content. According to research by (Santi Chismirina et al., 2014:687), Arabica coffee has a lower pH (4.85-5.15) compared to Robusta coffee (5.25-5.40). The caffeine content in Arabica coffee is 0.8-1.5% and in Robusta coffee 1.6-2.5%. Arabica coffee is the best quality coffee compared to other types of coffee, has a strong distinctive taste, slightly sour taste, and a better aroma profile. The benefits of drinking coffee include reducing the risk of Alzheimer's disease, gallstones, and Parkinson's. Caffeine has pharmacological effects that are clinically beneficial, such as stimulating the central nervous system, relaxing smooth muscles, especially bronchial smooth muscles, and stimulating the heart muscle.

Cascara coffee is a drink made from dried and brewed coffee skin waste. According to (Dylla Hanggaeni Dyah Puspaningrum and Ni Luh Utari Sumadewi, 2019:423), cascara is a processed product of coffee fruit skin that undergoes a process of sorting, washing, peeling, and drying the coffee fruit skin. Pirdan Garis et al.

stated that the benefits of cascara include being able to ward off free radicals, protect the stomach, and are good for the skin to make it look firm. Cascara contains various active compounds such as tannins (1.8% -8.56%), pectin (6.5%), caffeine (1.3%), chlorogenic acid (2.6%), caffeic acid (1.6%), and total anthocyanins (43%), making it very suitable for preventing the growth of cancer cells and increasing endurance.

Coffee processing and brewing methods play an important role in determining the quality of coffee drinks. There are several coffee bean processing methods that are quite well-known in Indonesia, such as full washed, semi-washed, honey process, and natural process. Coffee brewing involves three main processes, namely wetting, extraction, and hydrolysis. Some popular brewing techniques include siphon, french press, tubruk, and drip. Brewing methods are divided into two main categories: immersion (such as french press and aeropress) and non-immersion (such as V60 and Kalita Wave). The immersion method produces flavor characteristics that tend to be stronger and fuller (round body), while non-immersion methods such as filter/pour-over produce a clearer flavor profile.

The quality of coffee drinks is determined by several aspects such as flavor/aroma, acidity/acidity, body/weight, taste/flavor, aftertaste, and sweetness. (Edy Panggabean in Ahmad Maulana Malik Ibrahim, 2020:23-25) explains that flavor is the first step in determining the characteristics and taste of coffee through its aroma. Acidity refers to the sour taste felt on the upper tongue, with three levels of acidity: low, medium, and high. Body indicates whether the coffee feels heavy/full in the mouth when consumed. Taste is the character of the coffee flavor such as fruity, cocoa, or citrus. Aftertaste is the taste of coffee that lasts the longest in the mouth. Sweetness in Arabica coffee is usually higher than Robusta, and indicates excellent coffee quality. Through product innovations such as "cascara Arabica", this study aims to produce alternatives for coffee lovers with low caffeine tolerance without reducing the experience of enjoying coffee.

RESEARCH METHOD

This study uses an experimental method to compare the level of consumer preference for "cascara Arabica" coffee and "regular Arabica" coffee, with the aim of finding a solution for coffee lovers who have low caffeine tolerance. The independent variables of the study are the two types of coffee, while the dependent variable is the level of preference for six factors: aroma, acidity, weight, taste, aftertaste, and sweetness. The study was conducted at Kancane Coffee & Tea Bar during February 2024, with product feasibility tested by experts on the first day of the study. This study involved 30 panelists aged 20-30 years consisting of 20 untrained panelists, 7 trained panelists (with a minimum coffee drinking frequency of 7 cups per week), and 3 expert panelists, namely the manager and two baristas of Kancane Coffee & Tea Bar. The selection of this age range aims to obtain subjective assessments from panelists who are considered to already understand the world of knowledge and coffee. The sources of research data include primary data obtained directly through interviews with panelists and secondary data from books, journals, and other relevant literature studies. The data collection methods used included a questionnaire with a Likert scale (5 = Very Like to 1 = Very Dislike), unstructured interviews with 3 experts and 27 other panelists, experiments combined with qualitative descriptive analysis, and documentation in the form of photos of hedonic test activities and panelist preference level data. Unstructured interviews were chosen because the researcher only used the outline of the problem as a guideline, allowing for more flexible and in-depth information collection.

Data analysis was carried out using descriptive statistics which is the process of transforming research data into tabulations so that they are easy to understand and interpret through numeric tables and graphs. The main measurement used was the hedonic test (preference test), in which panelists were asked to express their personal responses to the six sensory attributes of the two coffee products. The results of the hedonic scale assessment were then analyzed using the Microsoft Excel program to determine the average preference level. The interval scale is determined based on the range formula (highest value – lowest value) divided by the number of interval classes (5), which produces five assessment categories: Very Like (4.20-5.00), Like (3.40-4.19), Quite Like (2.60-3.39), Less Like (1.80-2.59), and Dislike (1.00-1.79). The results of the observations that have been analyzed are calculated as an average percentage and matched with the available category table to determine the level of panelist preference, so that researchers can draw conclusions about the potential of "cascara Arabica" coffee as an alternative for coffee lovers with low caffeine tolerance.

RESULTS AND DISCUSSION

Arabica coffee (Coffea Arabica) is known as the best quality coffee compared to other types of coffee, has a distinctive strong taste characteristic, slightly sour, and a superior aroma profile. Meanwhile, cascara coffee is a drink produced from coffee skin waste that has gone through a drying and brewing process.

Cascara itself is a processed product of coffee fruit skin that is processed through several stages, including sorting, washing coffee beans, peeling, and drying the fruit skin. This processing process turns coffee skin waste into raw materials for drinks that can be consumed.

This study focuses on the experiment of brewing two types of coffee drinks, namely "cascara Arabica" and "regular Arabica" using the French press brewing technique. The main objective of this experiment is to evaluate the potential of cascara Arabica coffee as an alternative to regular Arabica coffee based on panelists' responses to both products.

The experimental methodology includes two stages of testing: product feasibility testing conducted by experts and sensory testing involving randomly selected Kancane Coffee & Tea Bar customers. In addition, researchers also conducted unstructured interviews with experts to obtain comprehensive assessments and responses.

The results of all stages of the experiment will be presented in descriptive form, presenting a detailed analysis of the comparison of the two types of coffee and the potential of Arabica cascara as an alternative to conventional coffee drinks based on organoleptic assessment and consumer preferences.

Panelist Characteristics in Coffee Research

This study involved a total of 30 panelists consisting of 27 customers and 3 experts from Kancane Coffee & Tea Bar. The characteristics of the panelists were analyzed based on two main parameters, namely gender and age, to provide a demographic picture of the participants involved in the organoleptic test.

Based on gender, the study noted the dominance of male panelists with a total of 26 people (87%), while female panelists only numbered 4 people (13%). This imbalance occurred because the

selection of panelists was carried out randomly at the research location, where at the time the hedonic test was carried out, the majority of visitors at the location were male.

In terms of age, all panelists were in the 20-30 year range, with the following distribution: 20 years old (7%), 21 years old (13%), 22 years old (27%), 23 years old (10%), 24 years old (7%), 26 years old (3%), 28 years old (7%), 29 years old (13%), and 30 years old (13%). These data show that the 22-year-old age group is the group with the highest percentage in this study.

The dominance of 22-year-old panelists in the study is associated with the condition of Kancane Coffee & Tea Bar which at the time the study was taking place was crowded with young people gathering with their friends, relatives, and families. This makes the study have a higher representation of this age group.

These panelist demographic characteristics are important to understand as a context in interpreting the results of organoleptic tests on Arabica cascara coffee and regular Arabica coffee, because taste and aroma preferences can be influenced by age and gender factors.

Experiment of "Cascara Arabica" Coffee and "Regular Arabica" Coffee

This experiment examines the comparison between "cascara Arabica" and "regular Arabica" coffee using the French press brewing method. The preparation stage involves the provision of ingredients (cascara Arabica coffee, regular Arabica coffee, and mineral water) and the preparation of brewing tools such as a stove, thermometer, food scale, kettle, French press, coffee grinder, and measuring spoon.

The brewing process of both coffees use an identical recipe from *Kancane* Coffee & Tea Bar, namely 15 grams of coffee and 225 ml of mineral water at a temperature of 90°C, a brewing time of 4 minutes, using the French press method. The similarity of this recipe ensures a fair comparison between the two types of coffee in terms of a water-coffee ratio of 1:15 and consistent brewing techniques.

The results of brewing "cascara Arabica" coffee received positive reviews from experts, with fruity aroma characteristics leading to raisin fermentation, a taste that tends to be light and fruity, acidity that resembles rosella tea, a clean aftertaste (not too pronounced on the back of the tongue), and sweetness that feels like cherry. Experts consider cascara Arabica to have a light weight but still has a thick accent. Meanwhile, "regular Arabica" coffee is considered to have different characteristics with a varied aroma of berries and nuts (nutty), a stronger and more complex taste, lighter acidity, light weight on the tongue, a typical fruity sweetness, and a long aftertaste on the back of the tongue. Experts emphasize that regular Arabica coffee produces a rich taste because it comes from coffee beans.

Based on t the experts' evaluation, both types of coffee were declared worthy to be tested on the panelists. The experts also concluded that "cascara Arabica" coffee can be an alternative to "regular Arabica" coffee, although each has a different character and flavor profile. Both can be enjoyed well through the right brewing method with the appropriate water and coffee ratio (1:15) and optimal water temperature (90°C).

Coffee Research Questionnaire Result Data

This study compared "cascara Arabica" coffee and "regular Arabica" coffee involving 30 panelists (27 customers and 3 experts from Kancane Coffee & Tea Bar). Both coffee samples were brewed using the same recipe from Kancane Coffee & Tea Bar and data were collected through a questionnaire assessing six organoleptic indicators: aroma, acidity, weight, taste, aftertaste, and sweetness with an interval scale of 1.00-5.00.

For "cascara Arabica" coffee, the highest assessment was seen in the taste indicator with 14 panelists giving a score of 5 (interval scale 4.20-5.00) and 11 panelists giving a score of 4 (interval scale 3.40-4.19). In the aroma indicator, the majority of panelists (14 people) gave a score of 4, while 9 people gave a score of 5. The weight indicator received a positive response with 15 panelists giving a score of 4 and 7 panelists giving a score of 5. For acidity, 12 panelists gave a score of 4 and 9 panelists gave a score of 5, while aftertaste was assessed with a score of 4 by 14 panelists and a score of 5 by 5 panelists. For the sweetness indicator, 10 panelists gave a score of 4 and 7 panelists gave a score of 5.

For "regular Arabica" coffee, the aroma indicator received the highest rating with 18 panelists giving a score of 4 and 8 panelists giving a score of 5. For the acidity indicator, 13 panelists gave a score of 4 and 11 panelists gave a score of 5. The weight indicator showed a more even distribution with 10 panelists giving a score of 5, 9 panelists giving a score of 4, and 8 panelists giving a score of 3. For the taste indicator, 12 panelists gave a score of 4 and 9 panelists gave a score of 5, with no panelists giving a score below 3.

Comparison of the two coffees showed that the "regular Arabica" coffee received more consistent high-score ratings across all indicators, with the majority of panelists giving ratings in the 3.40-5.00 interval scale. Meanwhile, the "cascara Arabica" coffee showed a wider variation in ratings, although it was still dominated by positive ratings, especially on the taste indicator which received the highest appreciation. These data indicate that although the two types of coffee have different organoleptic characteristics, both were well received by the majority of panelists, with the "regular Arabica" coffee tending to have higher overall rating consistency.

Data Analysis

This study used the hedonic test method to analyze the data, which is a method to assess the level of panelists' preference for the results of the experiment. The assessment was carried out on six indicators: aroma, acidity, weight, taste, aftertaste, and sweetness. The assessment system uses a Likert scale of 1-5, where 1 means very dislike, 2 means less like, 3 means quite like, 4 means like, and 5 means very like.

Data analysis in terms of Aroma, Acidity, Weight, Taste, Aftertaste, and Sweetness

Based on the results of the hedonic test, the comparison of "cascara Arabica" and "regular Arabica" coffee showed differences in the level of preference for six indicators. In the aroma indicator, "regular Arabica" coffee is preferred (97%) compared to "cascara Arabica" coffee (80%) because the aroma of "regular Arabica" coffee is more representative of coffee products and has a richer variety of fruit aromas such as strawberries, grapes, and cherries.

For the acidity and weight indicators, "regular Arabica" coffee also scored higher with a percentage of 97% and 90%, while "cascara Arabica" coffee got 87% and 86%. Panelists liked the acidity of "regular Arabica" coffee which was not too high and comfortable, as well as a thicker and

fuller weight in the mouth compared to "cascara Arabica" coffee which had a stronger acidity and a lighter texture.

In the taste indicator, "regular Arabica" coffee was again superior with a 100% preference level compared to "cascara Arabica" coffee (94%). "Regular Arabica" coffee was considered to have a more unique and distinctive taste such as citrus and tamarind, while "cascara Arabica" coffee had a fruity taste like berries that was quite liked by panelists but not as unique as "regular Arabica" coffee.

The aftertaste test results showed that "regular Arabica" coffee obtained a percentage of 90% while "cascara Arabica" coffee was 84%. Panelists felt that the aftertaste of "regular Arabica" coffee left a stronger mark and had a longer duration (long-sweet aftertaste) compared to "cascara Arabica" coffee. In the sweetness indicator, "cascara Arabica" coffee was superior with a percentage of 96% compared to "regular Arabica" coffee 93%, because the sweetness of "cascara Arabica" coffee was not too contrasting and the majority of panelists did not really like sweet drinks.

Figure 1 Preference Test Results of "Arabica Cascara" Coffee Based on Indicators: Aroma, Acidity, Body, Flavor, Aftertaste, and Sweetness

Indikator	Frekuensi	Rerata	Presentase (%)	Kriteria Kesukaan
Flavour	13	3,58	80%	Suka
Acidity	21	3,62	87%	Suka
Body	22	3,55	86%	Suka
Taste	25	3,95	94%	Suka
Aftertaste	19	3,44	84%	Suka
Sweetness	17	3,56	96%	Suka

[Source: Primary Data, 2024]

Figure 2 Preference Test Results of "Regular Arabica" Coffee Based on Indicators: Aroma, Acidity, Body, Flavor, Aftertaste, and Sweetness

Indikator	Frekuensi	Rerata	Presentase (%)	Kriteria Kesukaan
Aroma	26	3,87	97%	Suka
Acidity	24	3,85	97%	Suka
Body	19	3,64	90%	Suka
Flavor	21	3,72	100%	Suka
Aftertaste	21	3,72	90%	Suka
Sweetness	20	3,60	93%	Suka

[Sumber: Primary Data, 2024]

Overall, the hedonic test results showed that "regular Arabica" coffee was preferred in five of the six indicators (aroma, acidity, weight, taste, and aftertaste), while "cascara Arabica" coffee was only superior in the sweetness indicator. This shows that although "cascara Arabica" coffee is acceptable to the panelists, "regular Arabica" coffee still has characteristics that are generally preferred by the panelists.

CONCLUSION

This study concluded that "regular Arabica" coffee is more preferred by consumers than "cascara Arabica" coffee because it has advantages in five indicators: aroma, acidity, weight, taste, and

aftertaste. Meanwhile, "cascara Arabica" coffee is only superior in one indicator, namely sweetness. The fundamental difference between these two coffees is the basic ingredients, where "cascara Arabica" coffee comes from dried coffee fruit skin, while "regular Arabica" coffee comes from coffee beans that are dried and then roasted. In terms of aroma, "regular Arabica" coffee outperforms "cascara Arabica" coffee by 17% (97% compared to 80%), both with the criteria of liking. For acidity, "regular Arabica" coffee is 10% superior (97% compared to 87%) because it has a sour taste that is not too disturbing. In terms of weight, "regular Arabica" coffee is more popular with a 4% advantage (90% versus 86%), where "regular Arabica" coffee has sufficient weight and a taste that sticks in the mouth, while "cascara Arabica" coffee is relatively light. In terms of taste, "regular Arabica" coffee is superior by 6% (100% vs. 94%) even though both coffees have distinctive flavors; "cascara Arabica" coffee with a berry or fruit flavor and "regular Arabica" coffee with a citrus or tamarind flavor. For aftertaste, "regular Arabica" coffee is superior by 6% (90% vs. 84%) because it has a stronger and longer-lasting aftertaste. However, in terms of sweetness, "cascara Arabica" coffee is superior by 3% (96% vs. 93%) because it has a sweet taste that is not too contrasting compared to "regular Arabica" coffee. Based on the results of the study, there are several recommended suggestions, namely: a better brewing method for "cascara Arabica" coffee is cold brew because it suits its high acidity, while "regular Arabica" coffee is better to use the V60 method to produce a more varied aroma. Both types of coffee are perfect to enjoy with desserts or sweet desserts. Due to the significant differences in characteristics between the two coffees, the timing of enjoying them can be adjusted to suit the atmosphere and how they are served.

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