The Indonesian coffee consumers perception on coffee quality and the effect on consumption behavior

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Abstract. The main issue of coffee commodity in Indonesia besides productivity is quality consistency. Defective coffee has a low quality level as well as low selling value and potentially detrimental for the coffee industry. However, despite its potential impact on coffee consumption behavior, the study on coffee quality based on Indonesian consumer perspectives is still limitedly published. This study aimed to investigate Indonesian coffee consumer perception on coffee quality and the effect on consumption behavior. The study was conducted using an online survey to coffee communities involving coffee consumers, and more experienced coffee consumers such as farmers, barista, Q-graders and coffee-based entrepreneurs in Indonesia. The data was analyzed for descriptive analysis, Cochran Q test and post hoc analysis using XLSTAT software and further visualized using Displayr online software. The result indicated that even though there were some similarity or agreement, the coffee consumers and more experienced consumers might perceive coffee quality differently. Those perceptions on quality might drive their different behavior on coffee consumption in Indonesia.

1. Introduction
Indonesia is the fourth largest coffee producing country after Brazil, Vietnam and Colombia, with a total production in 2017 of 10.8 million 60-kg bags [1]. Currently, Indonesia becomes a potential coffee consumer along with the growing popularity of local Indonesian coffee so that its production also increases to meet domestic demand for local coffee. Some well-known local coffee are Java coffee, Sumatra Mandheling, Aceh Gayo, Sulawesi Toraja, Bali Kintamani, Flores Bajawa and etc.

The weaknesses of the coffee commodity in Indonesia include productivity and quality consistency [2,3]. Coffee quality can be influenced by various factors from farming to processing and serving [4]. Many coffee plantations are still managed by locals and its post-harvest handling and production sector at the farmer level are still facing some issues which causing quality inconsistency in Indonesian coffee commodities from several regions [2]. Coffee whose quality does not meet standards or is considered as a defect has a low-quality level and is not preferred by consumers. Thus, the quality of coffee can influence consumer consumption behavior.
The main factors of coffee consumption and purchasing behavior are functional, taste and pleasure, habit, tradition and culture, and socialization [5]. Other study also revealed that nine attributes of coffee powder (aroma, flavor, availability, price, package material, package design, package size, shelf life, and label design) had a positive impact towards consumer behavior with price and availability as the main priority [6]. A recent study [7] revealed that coffee consumption is still price-oriented, but consumers are interested in purchasing coffee with associated health claims. There is limited study on coffee quality based on Indonesian consumer perspectives. This study aimed to investigate Indonesian coffee consumer perception on coffee quality and the effect on consumption behavior.

2. Methods

The study was conducted in June-August 2020. Data gathering was based on an online survey using Google Forms. Data was collected using a questionnaire with open-ended and closed-ended questions, with likert (1-5 scales on preference) and binary data (yes/no, chosen/not chosen). The respondents were coffee communities which consist of coffee consumers, coffee farmers, barista, Q-graders (a person certified by the Coffee Quality Institute (CQI) as capable of analyzing Arabica coffee through aroma and taste, known as cupping, R-graders (same as Q-grader but specified for Robusta coffee) and coffee-based entrepreneurs in Indonesia. The data was analyzed using XLSTAT (Addinsoft Inc, New York, USA). Significant different (α = 0.05) between two groups was assessed by Mann-Whitney test while significant different (α = 0.05) within each group was evaluated by Cochran Q-test, McNemmar Bonferroni. Visualization of the result was using Displayr online software (Glebe, NSW, AU).

3. Results and Discussion

3.1. Respondent demographics

The basic questions in the questionnaire regarding demographic data are shown in Table 1. The total of 513 respondents was sorted into 478 people before further data processing. Sorting was conducted to get rid of double-entry data and to check data validity where only those who consumed coffee counted.

Table 1. Respondent demographics.

| Specification             | Frequency | Percentage (%) |
|---------------------------|-----------|----------------|
| Gender                    |           |                |
| Female                    | 261       | 54.6           |
| Male                      | 217       | 45.4           |
| Age                       |           |                |
| <20 years old             | 26        | 5.4            |
| 20-25 years old           | 189       | 39.5           |
| 26-30 years old           | 51        | 10.7           |
| 30-35 years old           | 32        | 6.7            |
| >35 years old             | 180       | 37.7           |
| Domicile                  |           |                |
| Greater Jakarta (Jakarta-Bogor-Depok-Tangerang-Bekasi) | 280 | 58.6 |
| East Java                 | 130       | 27.2           |
| West Java                 | 15        | 3.1            |
| Central Java              | 12        | 2.5            |
| West Sumatera             | 5         | 1.0            |
| North Sumatera            | 7         | 1.5            |
| Other                     | 29        | 6.1            |
| Education                 |           |                |
| Senior High School        | 148       | 31.0           |
| Bachelor Degree           | 271       | 56.7           |
| Master Degree             | 55        | 11.5           |
| Doctoral Degree           | 4         | 0.8            |
Table 1 reveals that respondents were mostly female, and most of the respondents are young people (20-25 years old) and adults, with the majority were from the Greater Jakarta area and East Java. The majority of respondents were graduated from Senior High School or hold a Bachelor Degree.

3.2. Consumer perception on coffee quality
The respondents were further categorized into consumer (13%) and more experienced consumer (87%). The consumer is considered as someone who only consumes coffee, while a more experienced consumer here is defined as someone who is not only consuming coffee, but also exposed more to coffee or involved in other coffee-related activities such as coffee cultivation, processing, serving, evaluation and business such as barista, owner coffee shops, Q-graders, R-grader, roasters, processors, and farmers. Table 2 shows the perception on coffee quality based on some questions on likert scale.

| Questions                                                                 | Consumer | More experienced consumer | p-value |
|---------------------------------------------------------------------------|----------|---------------------------|---------|
| In your opinion, how important is the effect of coffee beans on coffee quality? | 4.60     | 4.63                      | 0.317   |
| In your opinion, how important is the effect of processing on coffee quality? | 4.66     | 4.79                      | 0.052   |
| In your opinion, how important is the effect of brewing technique on coffee quality? | 4.44     | 4.61                      | 0.045   |
| The type of packaging and packaging technology affect coffee quality       | 4.08     | 4.32                      | 0.045   |
| Storage time will affect the quality of coffee                            | 4.34     | 4.69                      | 0.001   |
| The post-harvest processing of coffee fruits into green beans will affect the quality of coffee | 4.22     | 4.60                      | 0.000   |
| Defective green coffee beans can produce coffee products with low quality level. | 3.61     | 4.08                      | 0.001   |
| Green coffee beans with poor quality / defects can be processed to produce coffee with good quality | 3.14     | 3.10                      | 0.992   |

Mean data from likert scale of 1 to 5 (disagree-agree) were presented. p-value in bold indicated significant different (α = 0.05) by Mann-Whitney test.

Table 2 shows that there is a significant difference (α = 0.05) between two groups of respondents on the response regarding questions on the effect of brewing technique, packaging, storage time, and post-harvest processing on coffee quality, and whether defective green coffee beans will produce low quality coffee. Even though those perceptions on quality might differ, both consumers and more experienced consumers, however, still believed that coffee beans quality and the processing influence coffee quality.

The quality of coffee brews and what is high-quality coffee according to respondents were also investigated. The result shows that there is a significant difference (α = 0.05) in the choice of attributes deemed to be important to coffee brew quality. Aroma (26%) and taste (27%) were chosen equally as the most prominent factors influencing the quality of coffee brews both by consumers and more experienced consumers.

Further investigation was carried out on high-quality coffee perception. There was a significant difference within and between groups of respondents on what they define or perceived about high-quality coffee. Both consumers group generally agreed that high-quality coffee beans (24%) will create a high-quality coffee while other factors could have a different sequence of priority, such as coffee.
origins, that is a choice of more experience consumers than for common consumer, and health reason that is more prominent for common consumers.

3.3. Consumer behavior

Based on the result, it can be seen that coffee consumers in Indonesia may have different behavior on choosing and consuming coffee. Consumer behavior investigated in this research including what coffee they commonly drink, where they prefer to drink and why they drink coffee. The result reveals that the coffee consumers commonly drink instant coffee (32%) and ice coffee milk (30%), while those having more experience on coffee tend to give more choice to a manual brewed (29%) and espresso-based coffee (28%). Interestingly, both choose ice coffee milk (~31%) as the most common coffee they drink showing the popularity of this product in the market. A previous study also revealed that coffee mixed with milk was the most chosen one (38%) by the panelists. Ice coffee milk had a light and sweet taste, thus it can be consumed by anyone, especially someone who just started to drink coffee [8]. Consumer behavior is a study of psychological, social, and physical actions when people buy, use, and dispose of products, services, ideas and practices [9]. People might choose different product to buy or to consume based on various factors. It could be related to their experiences, needs, and environmental or social community influence. Interpretation of certain sensations could be influenced by available knowledge and thought. For example, the perception of coffee which is thought as a bitter beverage has led people who are not fond of bitter beverages to add ingredients such as sugars or milk in order to reduce bitterness. On the other hand, others might choose “just coffee” without sugars or milk or other additional ingredients since they perceived it is healthier or it will really bring out coffee characters or other reasons.

| Statements                                                                 | Consumer | More experienced consumer | p-value |
|---------------------------------------------------------------------------|----------|---------------------------|---------|
| I like to drink coffee because of its pleasant taste                      | 4.33     | 4.68                      | 0.001   |
| I drink coffee because it has become a habit                              | 3.39     | 4.27                      | < 0.0001|
| I drink coffee because I am invited/recommended by people around me       | 3.29     | 3.24                      | 0.750   |
| I drink coffee to broaden my networking                                   | 2.89     | 3.74                      | < 0.0001|
| I drink coffee because the coffee shop is comfortable and convenient      | 3.45     | 3.65                      | 0.202   |
| I drink coffee because I like its sensation (such as Dalgona coffee, Affogato, and etc.) | 3.38     | 3.32                      | 0.562   |
| I drink coffee because I saw the advertisements on TV and social media    | 2.54     | 2.47                      | 0.648   |
| I drink coffee because of its promotions and discounts                    | 2.99     | 2.76                      | 0.183   |
| I drink coffee because of social status (to look cool and improve my lifestyle) | 1.80     | 1.89                      | 0.851   |
| I like drinking coffee accompanied by music/songs                          | 3.59     | 3.74                      | 0.258   |

Mean data from likert scale of 1 to 5 (disagree-agree) were presented. p-value in bold indicated significant different (α = 0.05) between two groups by Mann-Whitney test

Table 3 shows the reason why people drink coffee. It can be seen that there is a significant difference (α = 0.05) within and between two groups of consumers on the reasons why they drink coffee. The result reveals that both consumers (more experienced or not) choose to drink coffee because of its pleasant taste and sensation, while their choice is also driven by promotion and discount. The more experienced
consumer groups significantly differ from the common consumer on the reasoning of networking purpose and because they get used to it or it already becomes their habit. Analysis on the location or where the respondents drinks showed that the onsite drinking (or drinking in coffee shops or cafes) is preferred mostly by the more experienced group. Meanwhile, common consumers preferred a takeaway method and consume coffee at home.

Further exploration was carried out on consumer behavior regarding what food they eat while drinking coffee to know what food suitable to pair with coffee based on their perception. Complementary food in this research consists of dishes (big meal) and side dishes (snacks). Table 4 shows dishes or big meals chosen by consumers and more experienced consumers. There is a significant difference ($\alpha = 0.05$) in the kind of dishes chosen within and between-group of respondents. Common consumers prefer to have no dishes when they are drinking coffee while the pasta is the most consumed dishes by more experienced consumers.

**Table 4.** Dishes consumed while drinking coffee.

| Item                  | More experienced consumer |          |          | Consumer |          |          |
|-----------------------|----------------------------|----------|----------|----------|----------|----------|
|                       | Frequency | Percentage (%) |          | Frequency | Percentage (%) |          |
| Fried rice            | 11        | 17.74  | ab       | 56        | 13.46     | bc       |
| Pasta                 | 18        | 29.03  | b        | 94        | 22.60     | cd       |
| Fried chicken with rice | 5        | 8.07   | ab       | 34        | 8.17      | b        |
| Noodles               | 13        | 20.97  | b        | 97        | 23.32     | d        |
| Rice with other dishes | 0        | 0.00   | a        | 7         | 1.68      | b        |
| Without dishes        | 15        | 24.19  | b        | 119       | 28.61     | d        |
| Bakso                 | 0         | 0.00   | a        | 2         | 0.48      | a        |
| Gado-gado             | 0         | 0.00   | a        | 1         | 0.24      | a        |

Frequency refers to how many times each item chosen by respondents. Percentage calculated from those who choose each item. Different notation indicated significant different ($\alpha = 0.05$) within each group by Cochran Q-test, McNemmar Bonferroni.

The side dishes or snacks chosen by both groups of respondents can be seen in Table 5. It revealed that there is a significant difference ($\alpha = 0.05$) in the kind of side dishes or snacks chosen within and between groups of respondents. Common consumers prefer to eat a fried snack or known as “gorengan” as their complementary food showing the popularity of fried snacks for the consumers in Indonesia. Meanwhile, the more experienced group likes to eat pastry to accompany their coffee.

A previous study showed that 77% of Millennials is having snacks every day with a higher proportion compared to the other age group [10]. Fried snacks or known as “Gorengan” is one of the common dishes for breakfast to dinner among Indonesian, beside steamed rice and coconut milk dish [11]. A survey by Snapcart [12] also revealed the top two reasons behind Indonesian snacking habits are “to fill the free time” (32%) and “overcoming hunger before mealtimes” (28%). Additionally, the chosen activities of Indonesians while they snack rated on its frequency from very often to sometimes are relaxing, studying, at work, hanging out with friends, before sleep, in the car during travel/commute and at party. This snacking practice can be categorized as tradition and culture, habit, as well as socialization. All of them are leading motives for coffee consumer consumption and purchasing behavior, besides functional, taste and pleasure [13].
Table 5. Side dishes consumed while drinking coffee.

| Item                  | More experienced consumer | Consumer |
|-----------------------|---------------------------|----------|
|                       | Frequency | Percentage (%) | Frequency | Percentage (%) |
| Pastry                | 17        | 27.42 c        | 91        | 21.88 de       |
| Toasted Bread         | 3         | 4.84 abc       | 58        | 13.94 cd       |
| Cookies               | 13        | 20.97 abc      | 70        | 16.83 cd       |
| Cakes                 | 5         | 8.07 abc       | 38        | 9.14 bc        |
| Fried Snacks          | 15        | 24.19 bc       | 130       | 31.25 e        |
| Fried Potatoes        | 3         | 4.84 abc       | 53        | 12.74 cd       |
| Chips                 | 1         | 1.61 ab        | 1         | 0.24 a         |
| Traditional Snacks    | 1         | 1.61 ab        | 0         | 0.00 a         |
| Without side dishes   | 4         | 93.55 abc      | 19        | 4.57 bc        |
| Kuaci                 | 0         | 0.00 a         | 1         | 0.24 a         |
| Fruits                | 0         | 0.00 a         | 1         | 0.24 a         |
| Crackers              | 0         | 0.00 a         | 1         | 0.24 a         |

Frequency refers to how many times each item chosen by respondents. Percentage calculated from those who choose each item. Different notation indicated significant different ($\alpha = 0.05$) within each group by Cochran Q-test, McNemmar Bonferroni.

Table 6. The most consumed instant coffee brands.

| Brands                   | More experienced consumer | Consumer |
|--------------------------|---------------------------|----------|
|                         | Frequency | %         | Frequency | %         |
| Kapal Api                | 21        | 33.871 b  | 79        | 18.990 de |
| Nescafe                  | 7         | 11.290 ab | 73        | 17.548 de |
| Good Day                 | 13        | 20.968 ab | 115       | 27.644 e  |
| Torabika                 | 1         | 1.613 a   | 25        | 6.010 bc  |
| Indocafe                 | 3         | 4.839 ab  | 27        | 6.490 bc  |
| Luwak White Coffee       | 0         | 0.000 a   | 35        | 8.413 cd  |
| Top Coffee               | 0         | 0.000 a   | 3         | 0.721 a   |
| ABC                      | 0         | 0.000 a   | 4         | 0.962 a   |
| Instant Coffee (others)  | 2         | 3.226 a   | 6         | 1.442 ab  |
| Excelso                  | 0         | 0.000 a   | 3         | 0.721 a   |
| Liong bulan              | 0         | 0.000 a   | 2         | 0.481 a   |
| None                     | 14        | 22.581 ab | 48        | 11.538 cd |
| Kopi Bintang Semende     | 0         | 0.000 a   | 1         | 0.240 a   |
| Old Town Coffee          | 0         | 0.000 a   | 3         | 0.721 a   |
| Capsules Coffee          | 0         | 0.000 a   | 1         | 0.240 a   |

Frequency refers to how many times each item is chosen by respondents. Percentage calculated from those who choose each item. Different notation indicated significant different ($\alpha = 0.05$) within each group by Cochran Q-test, McNemmar Bonferroni.

Regarding behavior on instant coffee consumption, or coffee in a sachet ready to brew on Table 6, it can be seen that the most consumed instant coffee brands among Indonesian coffee consumers differs significantly between consumers and more experienced consumer, and within each group of consumer.
“Good Day” was mentioned as the most consumed instant coffee by common while more experienced group chose “Kapal Api” the most.

It is not surprising that Kapal Api and Good Day were the best two chosen brands since both are produced by the same company, PT Santos Jaya Abadi, that is a pioneer of instant coffee in Indonesia. A research by Lautiainen [13] revealed that there was a relationship between social, personal and psychological factors and the decision-making process in coffee brand selection, but statistically, the reliability is not strong. In addition, consumers can also base their selection on beliefs and attitudes of psychological factors.

3.4 Aroma preferences in coffee

The aroma is one of the first sense experienced during preparing and consuming coffee, thus consumer preferences on the coffee aroma of all data (consumer and more experienced consumer) was investigated and presented on a world cloud visualization as shown in Figure 1. It can be seen that the preferred aroma in coffee chosen by the respondents mostly were chocolatey, fruity, nutty, and flowery while the disliked aroma was chemical, musty, moldy, and baggy. Consumers prefer a pleasant, sweet aroma and they expect no off-flavors especially contaminants in the coffee they consumed. However, it should be noted that this study is limited to the number of respondents as indicated in the method, and therefore generalization to the Indonesian population could not be made.

![Preferred (a) and un-preferred (b) aroma in coffee.](image)

4. Conclusions

Indonesian coffee consumers may have a different perception on coffee quality due to the different experiences they have. Determining coffee quality is somehow difficult even though consumers might agree on certain quality attributes. The consumer perceptions on coffee quality might drive different coffee consumption behavior to some extent. Further investigation will need to include a larger sample size (respondents) to provide a better view on Indonesian coffee consumer’s perceptions. Data exploration and investigations such as on willingness to buy, music types the people like while drinking coffee, the packages and convenience, sensation, or other aspects required by consumers will be interesting to study so that the distributed product is market-driven and based on consumer needs.

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