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Modification Of Milk Coffee Jam Using Low- Grade Coffee Based On Consumer Acceptance (Coffee Grade 4-6)

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A B S T R A C T

Garut is a city with abundant agricultural wealth. One of the commodities produced by Garut plantations is coffee. Many entrepreneurs are looking for the best quality coffee so that poor- quality coffee does not sell on the market, even if the selling price is meager. Efforts made to increase the selling price of low-quality coffee are to process the product into new, valuable products. This research aims to improve the selling price of low-quality coffee by modifying the product in the form of milk coffee jam by determining the recipe formula, packaging and selling price label, form of promotion, and consumer acceptance of the milk coffee jam product. The method used in this research is an experimental method with a quantitative approach through organoleptic tests on 30 semi-trained panelists by giving three samples of coffee milk jam products to get the best with the SK1, SK2, and SK3 formulations. The research results show that the SK1 formulation is the best product. Next, a consumer acceptability test was carried out on 100 consumer panelists. The resulting score for coffee milk jam is 4,507 on a class interval scale of 4,200 – 5,000, where the scale shows that consumer panelists can accept the product with a calculated selling price for coffee milk jam of IDR 34,000.

A R T I C L E I N F O

1. INTRODUCTION

The tourism sector is essential to Indonesia's economy due to its consistent yearly growth (C. Ningsih, A. Sudono, 2016). However, the COVID-19 pandemic in 2020 has affected the decline in visits of foreign and domestic tourists. Indonesia is a country that can become a tourist destination for offering a wealth of cultural and natural treasures (Siswhara, G., Masharyono. & Anggraeny, D., 2017).

Based on visit data obtained by the Central Statistics Agency (BPS) above, there has been a decrease in foreign tourist visits to Indonesia, which can be seen based on data processed cumulatively (January-August 2020) where the number of foreign tourist visits to Indonesia reached 3.41 million, comparable to a decrease of 68.17 percent compared to 2019 which amounted to 10.71 million visitors. This decline has harmed almost all sectors, especially the tourism industry in Indonesia, which has resulted in MSME players in this industry experiencing a downturn.

The area that was negatively impacted by the tourism sector was West Java Province. This province has three main contributors, one of which is culinary tourism. The culinary business is a sector that influences the growth of the tourism industry (Fajri, I., Rizkyanfi, M., & Smaya, R., 2021).

Culinary tourism cannot be separated from the local potential of each region based on its natural riches. Tourism research has undergone a paradigm shift, highlighting the importance of local food in enhancing destination appeal (Hsu and Scott, 2020). One area that has abundant beauty and natural wealth is Garut. The leading commodity of Garut plantations is coffee, and its total production always increases yearly.

Coffee is a tropical commodity with worldwide popularity and appeal based on its unique taste supported by other factors, such as history, tradition, social and economic. Indonesia is the fourth largest coffee exporting country in the world. In the distribution process, coffee starts from farmers who sell to collectors and is exported domestically and abroad (Wang & Yu, 2017). Coffee that is exported must meet the quality set by Indonesian National Standards. The place and habitat of the coffee grown can influence these differences in coffee types. The differences in coffee types will, of course, affect the characteristics of the coffee itself, such as acidity, caffeine content, and taste (Adhisty, D.F., Iskandar, R. & Suwandi, A., 2018).

The quality or grade of coffee sold on the market is generally above grade 4. Meanwhile, grades below this are sold for IDR 15,000 to IDR 50,000/kg.

Farmers and MSMEs collaborate with cooperatives in their efforts to achieve quality prosperity. The cooperative is developing innovation and product modification to increase the selling price of low-grade coffee.

Modification can be interpreted as a change related to culinary arts, developing food by changing a pre-existing recipe with a specific purpose (Karina & Amirihati, 2017). Modifying recipes requires creativity. Creativity is an essential skill of gastronomy professionals in food services to differentiate themselves in a competitive environment and to work with scarce resources (Bessi, V. G., Schmitz, P. T., Weschenfelder, S. & Almeida, T. V., 2022).

This research aims to increase the selling price of low-grade coffee by modifying it into milk coffee jam. Milk coffee jam can also be a typical Garut souvenir to open new markets because the products sold by souvenir shops in Garut are not varied or relatively the same. Since jam has a long shelf life, it is practical and versatile, making it suitable as a souvenir product. (Aisyah, S., Rumayar, C. H. & Bridha, R. L., 2014).

2. LITERATUR REVIEW

2.1. Tourism

Tourism is an activity organized for tourists to achieve their desired travel goals with temporary transfers, so this process can become a phenomenon (Bafadhal, 2018). Tourism is a new industry that can rapidly increase a country's economic growth by opening up jobs, income, and community welfare and contributing to other production sectors (Kuhn et al., 2023).

According to Utama (2017), tourism is a new industry that can increase a country's economic growth quickly by opening up jobs, income, and community welfare, as well as contributing to other production sectors in the country. This statement is in line with the opinion of Simanjuntak (2015) that tourism is one of the business sectors that is engaged in increasing real income growth, salaries for employees, foreign exchange regulations, or reciprocal exchange rates between countries so that tourism contributes significantly to social and economic life, and culture for a country, which is appreciated over time.

From these several definitions, it can be concluded that tourism is an activity carried out by tourists to achieve specific goals by moving temporarily so that this activity can improve the economy of a country visited.

2.2. Product Modification

Karina & Amrihati (2017) argue that modification is a development or change process which, when related to culinary arts, is the process of developing food by changing existing recipes into new food products with specific goals such as:
a. Creating a new, varied recipe
b. Changing ingredients for nutritional and health purposes
c. Changing the taste, shape, and appearance of food to improve
d. Improving the quality of food service so that consumers can accept it
e. Developing culinary skills and knowledge

Modifying a food product involves changing a recipe into a new food by changing the shape, appearance, nutritional value, aroma, taste, and texture. This can be done by changing the food ingredients (adding, subtracting, or replacing ingredients), cooking methods, or changing the number of servings made (Nabilah, Priatini, & Tsaniah, 2022).

2.3. Product Quality

Kotler and Armstrong (2012) state that the meaning of product quality is the ability of a product to perform its function; this includes overall durability, reliability, accuracy, ease of operation, and product repair, as well as other product attributes.

Product quality is created to gain attention by satisfying consumer wants and needs (Nabilah et al.; I., 2022). Since sensory quality is the most profoundly related aspect to perceived quality, developing innovations in sensory sciences directed at coffee may represent an essential tool for improving this product's quality (Souza et al., 2022).

Companies must be able to create products based on the concept of innovation to create added value from consumers by developing product quality aspects that can compete with other companies and meet market needs in the future. Product quality is not just about product development itself but how the company develops its human resources (Hoe & Mansori, 2018).

2.4. Coffee

Coffee is one of the commodities that is cultivated by countries in tropical regions such as the African continent, Central and South America, and Asia Pacific. The two most famous types of coffee are Arabica and Robusta (Herawati D, 2024). Coffee, like wine and beer, has a wide aroma spectrum, yet coffee-food pairings have not found their way into the menu of fine restaurants and the scientific literature (Rune, Christina J.B., 2022).

Currently, four areas are coffee production centers in Indonesia, namely Nanggroe Aceh Darussalam, North Sumatra, East Java, and South Sulawesi followed by West Java, especially Garut district (Fauziah & Ihwana, 2015).

Based on the decision of the National Standardization Agency (2008) coffee has grades or quality levels as follows:

Table 1. Coffee Quality

Quality	Condition
Quality 1	Maximum number of handicap values 11*
Quality 2	The number of handicap values is 12 to 25
Quality 3	The number of handicap values is 26 to 44
Quality 4a	The total handicap value is 45 to 60
Quality 4b	The total handicap score is 61 to 80
Quality 5	The total handicap value is 81 to 150
Quality 6	The total handicap value is 151 to 225

Source: SNI, 2008

Quality 4 Arabica coffee is not divided into sub-Quality 4a and 4b. Determining the defect value for each defective bean is included in the peaberry and polyembryo coffees.

Table 2. Coffee Quality

No	Quality	Condition
1	1 black seed	1
2	1 black seed Some	½
3	1 broken black seed	½
4	1 coffee log	1
5	1 chocolate bean	¼
6	1 large coffee shell	1
7	1 medium-sized coffee shell	½
8	1 small coffee shell	1/5
9	1 horny skinned seed	½
10	1 large horn skin	½
11	1 medium-sized horn skin	1/5
12	1 small horn seed	1/10
13	1 seed broken	1/5
14	1 young seed	1/5
15	1 seed with one hole	1/10
16	1 seed has more than one hole	1/5
17	1 spotted seed	1/10
18	1 twig, dirt, or large stone	5
19	1 medium-sized twig, earth or stone	2
20	1 twig, dirt, or small stone	1

Source: SNI, 2008

The defect values are calculated from a test sample weighing 300 g. If one coffee bean has more than one defect value, then determining the defect value is based on the weight of the most significant defect value.

2.5. Milk

Milk is a food that contains good nutrients needed by the human body, such as protein, fat, calories, lactose, nutrients, calcium, and vitamin A. Milk is a white liquid that is obtained from animals such as cows (Navyanti & Adriyani, 2016).

The following is a table of the nutritional content of cow's milk:

Table 3. Nutrient Content in Cow's Milk

Nutritional Content	In Milk
Calories	69/100 ml
Vitamin A	21 IU/gram fat
Vitamin B	4 µg/100ml
Riboflavin	159 µg/100 ml
Vitamin C	2mg ascorbic acid/100 ml
Vitamin D	0.7 IU/gram fat
Calcium	0.18%
Iron	0.06%
Phosphorus	0.23%
Cholesterol	15 mg/100 ml

Source: Firman, 2010

2.6. Jam

Jam is made from crushed fruit and added sugar, with a semi-solid or thick texture. Jam is a complementary food that cannot be served alone to be used as an accompaniment or an additional ingredient in other food products. Jam is widely used for spreading bread and filling bread, cakes, donuts, cookies, and other foods (Adipura, A., Priatini, W. & Andriatna, W. 2014). The types of jam products sold today show that most fruit jams, on average, use strawberries, blueberries, and pineapple as the main ingredients (Fadhilah, A, K., Priatini, W. & Rumayar, C, H., 2017).

2.7. Recipe Formulation

In making food products, a recipe is essential as it serves as a reference for producers in making a dish because a recipe contains a collection of instructions or work steps, ingredients, and tools, as well as how to process and cook a dish (Karina & Marihati, 2017). In making jam, thickening agents are needed, and food thickening agents are widely used to modify rheological and textural properties and enhance the quality attributes (Himashree, P., Sengar, A. S., & Sunil, C. K., 2022).

2.8. Selling Price

Selling price is a measure that balances the desire to maximize profits from high income and reduced sales volume. Prices are set after considering production and marketing costs, which are added by a certain amount to cover direct costs, overhead, and profits (Kurniawan, 2014). Price is part of the marketing mix called 4P (price, product, place, and promotion). Efforts to generate income are called price, while other marketing mix elements, namely product, place, and promotion, are costs or expenses that the company or business unit must pay (Haque-Fawzi et al., 2021). In buying and selling transactions, money is used as a measuring tool to determine prices. Price is a determinant of the success of a business because price determines the profit obtained after selling the product to consumers (Kurniawan, 2014).

According to Suarsana (2007), the method for determining food selling prices is:

a. Standard Cost Percentage

It is a way of determining the selling price of food and beverages based on the cost percentage that has been determined by the company, with the following formula:

$$Selling\ Price = \frac{Total\ Cost}{Food\ Cost\ Percentage} X100\%$$

b. Cost Factor Percentage

It is a method of calculating the selling price of food and beverages by multiplying the factor number by the cost of food with the following formula:

$$Factor\ Number = \frac{100\%}{Food\ Cost\ Percentage}$$

c. Unstructured Method

It is a method of calculating the selling price of food and drinks by comparing the selling prices of the same product at other companies in the area where it is located.

Food Cost	40%
Labor Cost	20%
Overhead	15%
Net Profit	25%
Selling Price	100%

Figures 1. Food Cost
Source: Author Data, 2022

In the company's standard calculations, food costs are around 30% – 35% and 40% if there is an increase in the market or the ingredients used are rare. The labor costs are generally 20% but can be more or less (Moreno, J., et.al, 2023).

3. METHODS

This research uses experimental methods through a quantitative approach with literature studies, questionnaires, and experiments. According to Sugiyono (2013), quantitative research methods aim to conduct surveys on specific samples or populations by collecting data using research instruments and carrying out statistical data analysis to test predetermined hypotheses. The experimental research was a kitchen project that involved conducting experiments on making milk coffee jam to find the effect of specific treatments and to get a recipe that created the best product. After being made, the product is tested through organoleptic tests on panelists, and the selling price and consumer acceptability are determined.

4. RESULTS AND DISCUSSION

Determining the recipe standard is the first step before the organoleptic test. Making milk coffee jam begins by cooking the milk with sugar until it thickens with a texture like sweetened condensed milk. After that, the coffee liquid is added and cooked again until it has a jam-like texture. Making milk coffee jam takes around 45-50 minutes, based on the number of grams used. Milk coffee jam stored in a closed container can also last 2 months of storage in the refrigerator and 2 weeks at room temperature. Researchers made three recipe formulations, each with a different ratio of coffee quantities. The following three formulations were tested:

a. Code SK1: 30ml coffee, 50g sugar and 450ml milk

    b. Code SK2: 20ml coffee, 50g sugar and 450ml milk
    c. Code SK3: 10ml coffee, 50g sugar and 450ml milk

Organoleptic tests were conducted on 30 semi-trained panelists of 5 chefs, 5 entrepreneurs, 5 academics, and 15 trainee students to determine the best recipe formulation. The results of the organoleptic test research carried out by researchers and trained panelists were summarized using Microsoft Excel in the following processing and analyzed using SPSS software through the Analysis of Variance (ANOVA) test with a confidence level of 95%. Further tests were carried out if there were significant differences ($P<0.05$) using the Duncan Multiple Range Test, which functions to determine differences between samples at a 95% confidence level.

The organoleptic test results show that semi-trained panelists prefer SK1 products with an average value of 21.87. This result differs from SK2 and SK3, with average values of 18.61 and 16.97. Based on these results, the SK1 formulation is the product that will be used in consumer acceptability tests on 100 consumer panelists from the general public.

The consumer acceptability test is carried out by tasting and providing an assessment of selected product samples by filling out a questionnaire, which includes organoleptic assessments, packaging and labels, and selling prices.

Product selling prices are calculated based on their composition, such as food costs (raw material costs), labor costs (labor costs), overhead (other costs), and, of course, profit (profit). The result of calculating the selling price of the product obtained is IDR 34,000,- with the following calculation:

Table 4. Selling Prices of Milk Coffee Jam per Pack

Selling Prices of Milk Coffee Jam	
Food Cost (40%)	Rp13.713
Labour Cost (20%)	Rp6.856
Overhead (15%)	Rp5.142
Net Profit (25%)	Rp10.284
Selling Price (100%)	Rp34.281
Selling Price Per Pcs	Rp34.000

The assessment score obtained in the consumer acceptability test was 4,507 based on accumulated data using Microsoft Excel on milk coffee jam with several categories, namely color, aroma, taste, texture, appearance, packaging, label, and selling price. After the accumulated scores have been obtained, the interval classes were compared based on the theory of Kusaeri, A., Quddus, A., & Zayadi. (2021).

Table 5. Consumer Acceptability Test Result Score

Score	Description
1.000 – 1.799	Strongly Unacceptable
1.800 – 2.599	Not accepted
2.600 – 3.399	Simply Accepted
3.400 – 4.199	Accepted
4.200 – 5.000	Highly Acceptable

The table above shows that coffee milk jam products can be HIGHLY ACCEPTABLE by consumers based on the results of consumer acceptability tests.

5. CONCLUSION

The recipe formulation used as a standard recipe for making milk coffee jam is the SK1

formula with a formulation of 30ml coffee, 450ml milk, and 50g granulated sugar. The raw materials used between the samples are the same; it's just that the amount of coffee liquid used in the three samples is different. The results of the milk coffee jam product with SK1 treatment produce a fairly dark chocolate jam color with a relatively strong coffee aroma and taste, and the soft texture of the jam resembles jam in general.

The selling price of milk coffee jam products is determined based on COGS and food cost calculations with a per-bottle price of IDR 34,281, rounded up to IDR 34,000.

The results of the organoleptic test for milk coffee jam products with texture parameters showed no fundamental differences in each sample treatment SK1, SK2, and SK3. Meanwhile, the color, aroma, taste, and appearance parameters showed significant differences in each treatment of SK1, SK2, and SK3 samples. To show the location of the differences in each treatment, a follow-up test was carried out using the Duncan test, which resulted in the highest assessment, namely SK1. Next, a consumer acceptability test was carried out on 100 people from the general public. The results of the consumer acceptability test obtained a total score of 4,507. If the score is based on the distribution table, it falls into a product category that consumers highly accept.

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