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Decision-Making System for Acceptance of Gayo Arabica Coffee Steeped Products with a Mixture of Herbs Using the MOORA Method

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ABSTRACT

Currently, processed coffee products with the addition of nutritious ingredients such as herbs are experiencing rapid development. Various herbal mixtures can produce delicious coffee, but consumer acceptance varies due to the sometimes-inconsistent brewing composition between coffee and the blending ingredients. Therefore, this research aims to determine the best decision-making system for accepting the Gayo Arabica coffee brewed product with a mixture of herbs using the MOORA method. There were 5 products analyzed, namely cuminpresso, olivepresso, kurmapresso, karipresso, and honeypresso. Furthermore, 30 ml espresso was used as the mixture base with the addition of 5 ml, 7 ml, and 10 ml of herbs for each product. The results showed that the panelists had different acceptance levels for each type of brewing. Therefore, the alternatives were obtained such that cuminpresso attained an acceptable level with the addition of 5 ml of black cumin oil, olivepresso with the addition of 5 ml of olive oil, kurmapresso with the addition of 10 ml of dates, karipresso with the addition of 5 ml of boiled water from curry leaves and honeypresso with the addition of 7 ml of honey.

1. INTRODUCTION

As a refreshing ingredient, coffee is much liked by the community due to its taste [1]. Along with the times, the beverages known today are not just black coffee. There are many popular variations, such as latte, flat white, mochaccino, and cappuccino [2]. According to Kurniawan and Ridlo [3], the consumption level of beverages processed from coffee has experienced rapid development due to a shift in lifestyle. Currently, the development of increasingly diverse coffee beverages makes the connoisseurs have diverse tastes [4].

Espresso, one of the most popular types of coffee, is defined as a beverage brewed from compressed coffee grounds and then sprayed with hot water at high pressure, where the energy from the water pressure passes through the grounds, as stated by Illy and Viani [5]. Also, it is the basis for a variety of popular coffee dishes circulating in the market [6]. Furthermore, Gayo Arabica coffee, as a popular raw ingredient of espresso, is used to produce beverages of higher quality and variety [7].

The different formulations in the development of espresso-based processed beverages have become an exciting challenge in determining the best-preferred taste. Research by Fisdiana et al. [8], which assesses the preference level for coffee syrup with full cream milk, shows that the panelists generally assess the different preference levels and formation for each type of brewing. This was conducted based on aroma, taste, color, after taste, and viscosity criteria. Hence, the acceptance level of the different formulations of espresso-based beverages was based on the taste factors. Research by Angeloni et al. [9] stated that the brewing method is one of the factors used in determining the consumer acceptance level when consuming coffee.

The acceptance of the preferred product is performed through a decision-making system (DSS) such as the Multi-Objective Optimization based on Ratio Analysis (MOORA), which was first introduced by Brauers and Zavadskas [10]. It has simple mathematical calculations and is easy to implement. Furthermore, the results obtained are also more accurate and targeted in helping decision-making [11]. In general, there are four principles in solving problems using the MOORA method, including making a decision matrix, decision matrix normalization, attribute optimization, and alternative ranking [12]. Making a decision matrix is done by determining the number of alternatives to be considered based on certain criteria. Decision matrix normalization is to get uniform matrix element values by uniting each matrix element. The attribute optimization is to optimize multi objectives where the normalization process with the maximum value minus the minimum value, and the final stage is the ranking of several alternatives to be decided.

This method has been widely applied in various fields of research, such as regional development [13], selection of manufacturing materials [14-18], employee performance appraisal [19, 20], selection of consulting firm [21], supply chain management [22-24], banking [25, 26], industrial management [27-29], and agriculture [11, 30, 31].

This research further aims to determine the best decision-making system for accepting the Gayo Arabica coffee brewed product with the addition of herbal variants using the MOORA method. This research is essential to get the optimal steeping composition with the best (highest) product acceptance. Considering that so far, the mixing of coffee with herbs is often inconsistent, resulting in an unbalanced coffee taste and

even being rejected by consumers. The MOORA method is multi-criteria technique processes simultaneously to optimize two or more conflicting attributes of value (benefit) or detrimental (cost) [32], it means that through the decision-making system of the MOORA method, product acceptance preferences consider both.

2. RESEARCH METHODS

Gayo Arabica coffee was obtained from the Redinesh Coffee Roastery coffee shop with direct supplies from farmers in Bergendal Village, Wih Pesam Sub-District, Bener Meriah Regency, Aceh Province, Indonesia, with a planting height of 1200-1400 masl. The coffee used was processed with complete wash and roasting at a medium level. Meanwhile, the herbs used as ingredients for coffee are black cumin (*Nigella sativa*), olives (*Olea europaea*), dates (*Phoenix dactylifera*), curry leaves (*Murraya koenigii* (L.) Spreng), and honey obtained from supermarkets and traditional markets.

The stages are divided into three parts, namely product making, sensory testing, and decision making using the MOORA method, as follows:

2.1 Product making

2.1.1 Espresso making

Gayo Arabica coffee beans were roasted and grounded using Macap M5 Grinder Made in Italy with a satisfactory level of fineness. Afterward, the grounds were weighed as much as 18-20 g and brewed using the La Pavoni Cellini Classic Espresso Machine E61 Group - Made in Italy for 20-25 seconds as much as 30 ml.

2.1.2 Herbs preparation

In this process, the herbs used as ingredients were black cumin oil from the 'Hemani' brand, packaged olive extract from the 'Rafael Salgado' brand, and honey from the 'Ad-Dawa Multiflora' brand obtained from the nearest supermarket.

Subsequently, the dates were prepared by peeling to separate the flesh and seeds. The flesh was then washed, weighed to 50 g, and crushed using a blender until smooth, then 100 ml of water was added [33].

The curry leaves were first dried at room temperature for 48 hours, then 50 g of them were weighed and crushed into small pieces. Furthermore, it was boiled for 30 minutes with the addition of 250 ml of water and then filtered to obtain the boiled water [34].

2.1.3 Mixing espresso with herbs

The composition was 30 ml of espresso as the basis for each mixing. The amount of herb added as a mixture using 3 variations, namely 5 ml, 7 ml, and 10 ml, resulted from direct observation during the trial process of making the product and references from several local coffee shops. This amount is a composition that is commonly used in serving coffee-based beverages, especially those using the espresso brewing method. The mixing of espresso with herbs, namely black cumin, olives, dates, curry leaves, and honey, are called cuminpresso, olivepresso, kurmapresso, karipresso, and honeypresso, respectively.

2.2 Sensory test

The sensory method used was the levelization test providing information on how much a product can be accepted based on the perception of each panelist. Furthermore, this was conducted to identify the flavors of various Gayo Arabica coffee brews with herbal mixtures based on predetermined criteria to obtain alternative product acceptance.

The selected panelists were asked to fill in the criteria weight of interest, including the modified coffee flavor parameter from SCAA [35]. Furthermore, this was assessed based on the panelists' knowledge about the coffee taste. This aimed to determine the weight of interest of each criterion used in assessing the taste (Table 1).

Table 1. Assessment on the weight of interest of the coffee taste criteria

Criteria	Definition	Weight of Interest (%)
Aroma	The smell that comes from the result of mixing coffee and herbs.	….
Flavor	The unique impression between aroma and after taste, which is felt on the tongue and nose when the aroma of steam flows from the mouth to the nose.	….
After taste	The length of time the favorable flavor (taste and aroma) lasts after the coffee is swallowed.	….
Balance	The balance of flavors caused by the taste, after taste, and body when coffee is drunk.	….
Body	The sensation of fullness (heavy/thick or light) in the mouth that is felt between the tongue and the palate.	….
Defect	Negative taste or defects that reduce the quality of coffee taste.	….
	TOTAL	**100%**

The interest weighting was conducted before presenting the product sample based on the definition of each criterion and the knowledge of the panelists during their time as Arabica coffee connoisseurs. The value of the weight of interest determines the amount for each criterion. Therefore, the result plays an essential role in the decision-making using the MOORA method.

In the next stage, the panelists assessed the acceptance of the Gayo Arabica coffee brewed product mixed with herbs based on the taste criteria as presented in Table 1. For example, the panelists were presented with honeypresso, which consisted of 3 treatments, namely the addition of 5 ml, 7 ml, and 10 ml honey, in which they identified the taste of each variant served and assessed the variations. The rating scale used was based on the product acceptance level, as shown in Table 2.

Table 2. Product acceptance levelization

Value	Acceptance Level
1	Level 1 (lowest)
2	Level 2
3	Level 3
4	Level 4
5	Level 5 (highest)

2.3 Panelists

The sensory test used 10 identified panelists, with modified

criteria from [36, 37].

a. Likes and consumes Gayo Arabica coffee at least 1 time a day
b. Know about Gayo Arabica coffee
c. Can provide a sensory assessment of the Arabica coffee taste
d. The senses are in good condition and not sick

The selection process of the panelist was conducted through interviews and filling out questionnaires related to consuming coffee habits and basic knowledge of coffee taste attributes.

The benefit of consistently determining the panelist's criteria is to ensure that the results of product acceptance decisions correctly meet the expectations of coffee connoisseurs who can identify flavors accurately through sensory testing.

2.4 Multi-objective optimization based on ratio analysis (MOORA) method

MOORA is a multi-objective method of decision-making that optimizes two or more conflicting attributes simultaneously [38]. Furthermore, this method solves highly complex problems and risks [10]. The mechanism is to weigh each specified criterion. Then, the results will be obtained from the weight assessment in the form of a set of alternative options with the highest to lowest values [39].

Quoted from Gorener et al. [25], the steps for completing the MOORA method are follows.

2.4.1 Making a decision matrix

$$X_{ij} = \begin{pmatrix} X_{11} & X_{12} & X_{1n} \\ X_{21} & X_{22} & X_{2n} \\ X_{m1} & X_{m2} & X_{mn} \end{pmatrix} \quad (1)$$

The decision matrix is represented as X_{ij}, where i represents m which is the number of alternatives, while j represents n which is the number of criteria.

2.4.2 Decision matrix normalization

The normalizing matrix was performed by dividing each score on the criteria by the denominator, which is the square root of the sum of the squares of each alternative per attribute [40]. The following describes the ratio:

$$X_{ij}^{*} = \frac{x_{ij}}{\sqrt{\left[\sum_{i=1}^{m} x_{ij}^{2}\right]}} \quad (2)$$

where, X^{*}_{ij} is a number included in the interval [0,1] and represents the result of the i-th alternative normalization on the j-th attribute.

2.4.3 Attribute optimization

The attribute optimization value is obtained based on the maximum (benefit) minus the minimum value (cost). It is described using the following formula:

$$y_i^{*} = \sum_{j=1}^{g} x_{ij}^{*} - \sum_{j=g+1}^{n} x_{ij}^{*} \quad (3)$$

where, g and $(n\text{-}g)$ represent the maximum and minimum attribute, respectively, and y_i is the normalized value of the i-th alternative on all attributes. Generally, it is often observed that some attributes are more important than others. Therefore, it is multiplied by the weight of interest to increase its priority. The following formula results when considering the attribute weight of interest.

$$y_i^{*} = \sum_{j=1}^{g} w_j x_{ij}^{*} - \sum_{j=g+1}^{n} w_j x_{ij}^{*} \quad (4)$$

where, w_j is the weight of the interest of the j criteria.

2.4.4 Alternative ranking

The value of y_i can be positive or negative, depending on the total maximum and minimum attributes in the decision matrix. The best alternative has the highest y_i value, while the worst has the lowest y_i value.

The overall research stages above can be summarized in Figure 1.

3. RESULTS AND DISCUSSION

3.1 Criteria weight of interest

The evaluation of the criteria weight of interest in percentages based on panelists' assessment shows that aroma weights interest of 23%, flavor 23%, after taste 18%, balance 15%, body 12%, and defect 9% (Figure 2).

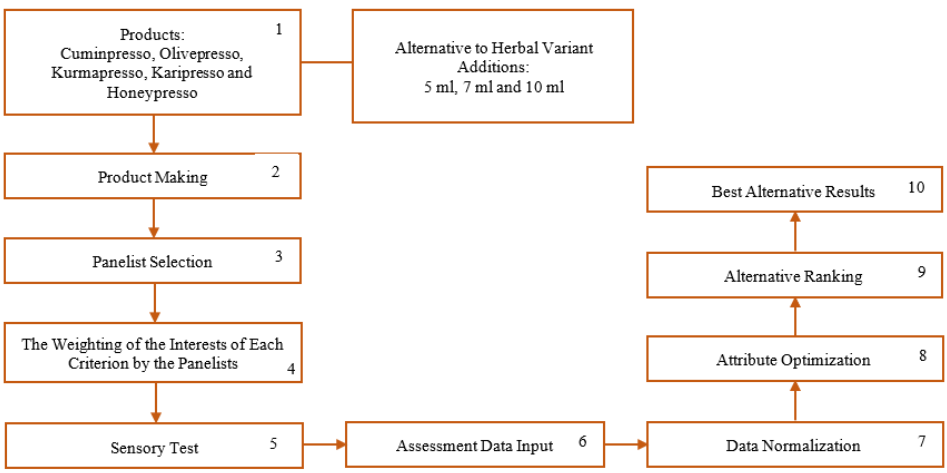


Figure 1. Research stage

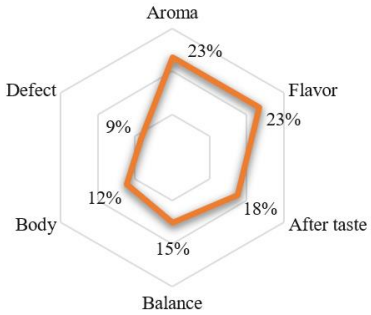


Figure 2. Evaluation of criteria weight of interest

Aroma and flavor have the highest weight of interest, among other criteria. Furthermore, Agustina et al. [41] stated that aroma plays an essential role in product acceptance testing because it greatly determines the level of consumer acceptance of a product. Likewise, according to Ranitaswari et al. [42], the flavor is essential in describing the product quality. Also, it was observed by Fadhil and Nurba [43] that in the sensory assessment of Gayo Arabica coffee, the flavor is the most or very important criterion according to consumer preference.

This proves that aroma and flavor have a significant influence on the flavor parameters of the coffee. Hence, it is natural that these two criteria have a higher significance of interest than the others.

The weight of interest is the level of interest compared to other criteria in a multi-criteria decision-making system. In the MOORA method, the interest of the criteria plays an essential role in the alternative ranking process, which affects the final decision making [44].

3.2 Decision matrix normalization

The sensory test results for assessing the taste of Gayo Arabica coffee with the addition of various herbal mixtures are as shown in Table 3. Furthermore, there were normalized with the matrix using Eq. (2).

The decision matrix normalization for each Gayo Arabica coffee brewed product with the addition of herbs is shown in Table 4.

3.3 Attribute optimization

Attribute optimization is the multiplication of the evaluation results of the importance of criteria weights by the panelists (Figure 2) with the results of normalization of the decision matrix (Table 4), resulting in data as shown in Table 5. Optimizing this attribute is very meaningful to help produce decisions from some alternatives considered. According to Khan and Maity [45], attribute normalization is an essential part of the MOORA method because this process determines the final result in the form of the best alternative.

Table 3. Recapitulation of panelists' assessment results

No	Product (A)	Amount of Added Herbs (H)	Criteria (C)					
			1 Aroma	2 Flavor	3 Aftertaste	4 Balance	5 Body	6 Defect
1	Cuminpresso	5 ml (1)	2.2	1.9	1.6	1.9	2.2	2.4
		7 ml (2)	2.2	1.7	1.6	1.8	1.9	2.5
		10 ml (3)	2.2	1.8	1.5	1.9	2.0	2.4
2	Olivepresso	5 ml (1)	2.7	1.7	1.6	1.8	1.7	2.1
		7 ml (2)	2.7	1.6	1.5	1.6	1.7	2.1
		10 ml (3)	2.3	1.5	1.4	1.6	1.3	1.9
3	Kurmapresso	5 ml (1)	3.5	3.0	2.9	2.9	3.1	2.8
		7 ml (2)	3.5	2.9	2.7	2.9	2.6	2.4
		10 ml (3)	3.1	3.1	3.0	3.2	3.1	2.8
4	Karipresso	5 ml (1)	3.5	2.9	2.7	2.9	2.8	2.3
		7 ml (2)	3.1	2.6	2.9	2.5	2.6	2.1
		10 ml (3)	3.1	2.7	2.9	2.5	2.4	2.2
5	Honeypresso	5 ml (1)	3.9	3.9	3.7	3.4	3.2	2.5
		7 ml (2)	3.7	4.3	3.6	3.7	3.6	2.6
		10 ml (3)	3.3	3.3	3.3	3.3	3.4	2.7

Table 4. Result of decision matrix normalization

No	Product (A)	Amount of Added Herbs (H)	Criteria (C)					
			1 Aroma	2 Flavor	3 Aftertaste	4 Balance	5 Body	6 Defect
1	Cuminpresso	5 ml (1)	0.577	0.609	0.589	0.587	0.624	0.569
		7 ml (2)	0.577	0.545	0.589	0.557	0.538	0.593
		10 ml (3)	0.577	0.577	0.553	0.587	0.567	0.569
2	Olivepresso	5 ml (1)	0.606	0.613	0.615	0.623	0.622	0.596
		7 ml (2)	0.606	0.577	0.576	0.553	0.622	0.596
		10 ml (3)	0.516	0.541	0.538	0.553	0.476	0.539
3	Kurmapresso	5 ml (1)	0.599	0.577	0.584	0.557	0.608	0.605
		7 ml (2)	0.599	0.558	0.543	0.557	0.510	0.518
		10 ml (3)	0.531	0.596	0.604	0.615	0.608	0.605
4	Karipresso	5 ml (1)	0.624	0.612	0.550	0.634	0.621	0.603
		7 ml (2)	0.553	0.549	0.591	0.547	0.576	0.551
		10 ml (3)	0.553	0.570	0.591	0.547	0.532	0.577
5	Honeypresso	5 ml (1)	0.618	0.584	0.604	0.566	0.543	0.555
		7 ml (2)	0.587	0.644	0.588	0.615	0.611	0.577
		10 ml (3)	0.523	0.494	0.539	0.549	0.577	0.599

Table 5. Attribute optimization process

Alternatives	Aroma	Flavor	Aftertaste	Balance	Body	Defect
Cuminpresso						
5 ml	0.23 × 0.577	0.23 × 0.609	0.18 × 0.589	0.15 × 0.587	0.12 × 0.624	0.9 × 0.569
7 ml	0.23 × 0.577	0.23 × 0.545	0.18 × 0.589	0.15 × 0.557	0.12 × 0.538	0.9 × 0.593
10 ml	0.23 × 0.577	0.23 × 0.577	0.18 × 0.553	0.15 × 0.587	0.12 × 0.567	0.9 × 0.569
Olivepresso						
5 ml	0.23 × 0.606	0.23 × 0.613	0.18 × 0.615	0.15 × 0.623	0.12 × 0.622	0.9 × 0.596
7 ml	0.23 × 0.606	0.23 × 0.577	0.18 × 0.576	0.15 × 0.553	0.12 × 0.622	0.9 × 0.596
10 ml	0.23 × 0.516	0.23 × 0.541	0.18 × 0.538	0.15 × 0.553	0.12 × 0.476	0.9 × 0.539
Kurmapresso						
5 ml	0.23 × 0.599	0.23 × 0.577	0.18 × 0.584	0.15 × 0.557	0.12 × 0.608	0.9 × 0.605
7 ml	0.23 × 0.599	0.23 × 0.558	0.18 × 0.543	0.15 × 0.557	0.12 × 0.510	0.9 × 0.518
10 ml	0.23 × 0.531	0.23 × 0.596	0.18 × 0.604	0.15 × 0.615	0.12 × 0.608	0.9 × 0.605
Karipresso						
5 ml	0.23 × 0.624	0.23 × 0.612	0.18 × 0.550	0.15 × 0.634	0.12 × 0.621	0.9 × 0.603
7 ml	0.23 × 0.553	0.23 × 0.549	0.18 × 0.591	0.15 × 0.547	0.12 × 0.576	0.9 × 0.551
10 ml	0.23 × 0.553	0.23 × 0.570	0.18 × 0.591	0.15 × 0.547	0.12 × 0.532	0.9 × 0.577
Honeypresso						
5 ml	0.23 × 0.618	0.23 × 0.584	0.18 × 0.604	0.15 × 0.566	0.12 × 0.543	0.9 × 0.555
7 ml	0.23 × 0.587	0.23 × 0.644	0.18 × 0.588	0.15 × 0.615	0.12 × 0.611	0.9 × 0.577
10 ml	0.23 × 0.523	0.23 × 0.494	0.18 × 0.539	0.15 × 0.549	0.12 × 0.577	0.9 × 0.599

Table 6. Attribute optimization results

Alternatives	Aroma	Flavor	Aftertaste	Balance	Body	Defect
Cuminpresso						
5 ml	0.135	0.142	0.103	0.088	0.077	0.048
7 ml	0.135	0.127	0.103	0.083	0.066	0.050
10 ml	0.135	0.135	0.097	0.088	0.070	0.048
Olivepresso						
5 ml	0.141	0.143	0.108	0.093	0.077	0.051
7 ml	0.141	0.135	0.101	0.083	0.077	0.051
10 ml	0.120	0.126	0.094	0.083	0.059	0.046
Kurmapresso						
5 ml	0.140	0.135	0.102	0.084	0.075	0.051
7 ml	0.140	0.131	0.095	0.084	0.063	0.044
10 ml	0.124	0.140	0.106	0.092	0.075	0.051
Karipresso						
5 ml	0.145	0.143	0.096	0.095	0.076	0.051
7 ml	0.129	0.128	0.103	0.082	0.071	0.047
10 ml	0.129	0.133	0.103	0.082	0.065	0.049
Honeypresso						
5 ml	0.144	0.137	0.106	0.085	0.067	0.047
7 ml	0.137	0.151	0.103	0.092	0.075	0.049
10 ml	0.122	0.116	0.094	0.082	0.071	0.051

The results of attributes optimization of each criterion on the Gayo Arabica coffee brewed product with the addition of herbs are shown in Table 6.

3.4 Alternative ranking

The last stage is the alternative ranking process for each Gayo Arabica coffee brewed product with a mixture of various herbs, namely the criteria that have a benefit value minus a detrimental value (cost), as shown in Table 7.

3.5 Product acceptance level

In the sensory assessment of the Gayo Arabica coffee brewed product, each panelist has a different acceptance level for each alternative product presented primarily because of the use of different types of herbs as mixed ingredients.

Furthermore, each herb used has a distinctive taste characteristic that affects the taste and level of panelists' preference for the product based on the concentration of the mixture. This is in line with the research conducted by Fitriyah et al. [46] regarding the quality of Arabica ground coffee, which states that each panelist has a different acceptance level based on different processing methods. Fadhil et al. [37] stated that implementing the decision-making system method in multi-criteria decision-making was easy and successful in selecting several alternatives to a product based on the panelist's assessment. In principle, the decision-making system method aims to determine the best alternative from the available [25]. Based on the calculations using the MOORA method, the following shows the best alternative for each type of Gayo Arabica coffee brewing.

3.5.1 Cuminpresso

Based on the sensory assessment of cuminpresso, the panelists preferred adding 5 ml black cumin oil with a score of 0.135 aroma, 0.142 flavor, 0.103 after taste, 0.088 balance, 0.077 body, and 0.048 defect (Table 6). All the cuminpresso

alternatives produce the same value on the aroma criteria because black cumin oil has a pungent aroma. Hence, it is a little difficult to distinguish between each alternative. According to Hayulistya et al. [47], this pungent aroma is produced from volatile compounds in black cumin. Generally, the alternative of adding 5 ml of black cumin oil was superior to each of the criteria compared to others. Pratiwi et al. [48] stated that in research on the manufacture of carbonated coffee beverages, the addition of black cumin oil was not suitable, hence, the panelists have less interest in the product of the coffee produced.

3.5.2 Olivepresso

For the sensory assessment of olivepresso, the panelists preferred adding 5 ml olive oil with a score of 0.141 aroma, 0.143 flavor, 0.108 after taste, 0.093 balance, 0.077 body, and 0.051 defect (Table 6). Furthermore, the olivepresso with the addition of 7 ml of olive oil has almost the same score as 5 ml. However, the alternative of adding 5 ml of olive oil was superior in terms of flavor, after taste, and balance criteria. Its excessive addition to the 30 ml espresso base made the panelists less interested in the resulting beverage. In research conducted by Arranz et al. [49] regarding the making of functional beverages with olive oil, it was stated that respondents prefer products with a composition of olive oil that is not too much but also not too little.

3.5.3 Kurmapresso

Based on the sensory assessment, the alternative of adding 10 ml dates was the most preferred by the panelists with a score of 0.124 aroma, 0.140 flavor, 0.106 after taste, 0.092 balance, 0.075 body, and 0.051 defect (Table 6). However, the panelists preferred the aroma criteria for the alternative addition of 5 ml and 7 ml of dates to the 10 ml because of their strong coffee aroma. Generally, the panelists preferred adding 10 ml of dates because its characteristic sweet taste was able to dominate and cover the bitter taste of coffee. Raiesi Ardali et al. [50] stated that the higher the concentration of date palm juice used, the higher the acceptability of a beverage product. Furthermore, the high fructose content in dates is good for health and has a higher sweet taste.

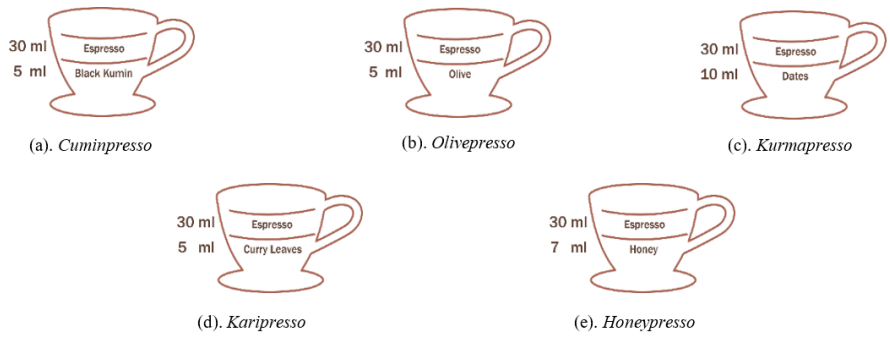
3.5.4 Karipresso

In the karipresso sensory assessment, the panelists preferred the addition of 5 ml curry leaf boiled water with a score of 0.145 aroma, 0.143 flavor, 0.096 after taste, 0.095 balance, 0.076 body, and 0.051 defect (Table 6). Furthermore, the panelists preferred the alternative of adding 5 ml because the aroma and after taste caused by curry leaves were not too dominant and did not eliminate the character of the coffee taste. Based on research conducted by Aurelia [51] regarding the making of functional beverages with the addition of curry leaf essential oil, the high use of its essential oil made the panelists less interested in the product.

Table 7. Ranking for each product

Alternatives	Maximum C1+C2+C3+C4+C5	Minimum C6	Yi = Max – Min	Rank
Cuminpresso				
5 ml	0.545	0.048	0.497	1
7 ml	0.515	0.050	0.464	3
10 ml	0.524	0.048	0.476	2
Olivepresso				
5 ml	0.562	0.051	0.511	1
7 ml	0.536	0.051	0.486	2
10 ml	0.482	0.046	0.437	3
Kurmapresso				
5 ml	0.535	0.051	0.484	2
7 ml	0.512	0.044	0.468	3
10 ml	0.536	0.051	0.485	1
Karipresso				
5 ml	0.556	0.051	0.505	1
7 ml	0.513	0.047	0.467	2
10 ml	0.513	0.049	0.464	3
Honeypresso				
5 ml	0.538	0.047	0.491	2
7 ml	0.558	0.049	0.509	1
10 ml	0.485	0.051	0.434	3

Descriptions: C1= Aroma; C2= Flavor; C3= Aftertaste; C4= Balance; C5= Body; C6= Defect



(a). *Cuminpresso* (b). *Olivepresso* (c). *Kurmapresso*

(d). *Karipresso* (e). *Honeypresso*

Figure 3. The best formulation of Gayo Arabica coffee brewed with a mixture of herbs

3.5.5 Honeypresso

Based on the sensory assessment of honeypresso, the panelists preferred the alternative of adding 7 ml of honey with a score of 0.137 aroma, 0.151 flavor, 0.103 after taste, 0.092 balance, 0.075 body, and 0.049 defect. The addition of 7 ml of honey was an alternative product with the highest value compared to 5 ml and 10 ml because the distinctive bitter taste in coffee does not entirely disappear and creates the right blend. According to Aji et al. [52] research on functional beverages with honey as a sweetener, panelists have different preferences for each parameter. However, the appropriate honey and coffee flavors mixture has the best acceptance level from the various products available. Sharma et al. [53] added that honey is very well used as a natural sweetener in beverage products, especially for consumers concerned about their health. Based on the results above, the composition of the Gayo Arabica coffee brewed product with a mixture of herbs is as shown in Figure 3.

4. CONCLUSION

The assessment of acceptance of the Gayo Arabica coffee brewed product with a mixture of herbs discovered the best alternative for each type of brewing to be cuminpresso with 30 ml espresso and 5 ml black cumin oil, olivepresso with 30 ml espresso and 5 ml olive oil, kurmapresso with 30 ml espresso and 10 ml dates, karipresso with 30 ml espresso and 5 ml curry leave-water, and honeypresso with 30 ml of espresso and 7 ml of honey. Therefore, using the MOORA method as a decision-making system solved the problem of determining the best alternative for each type of Gayo Arabica coffee brewed with a mixture of herbs, hence it is easier to make decisions about product acceptance from some available alternatives.

The contribution of this research lies in two things at once. First, to produce the best brewing composition for mixing Arabica coffee with various herbs, it becomes a separate reference for coffee entrepreneurs and coffee connoisseurs around the world. Second, the application of the MOORA method for product acceptance decision making can be one of the methods that can be useful in the coffee taste sensory assessment system. Therefore, this article is one of the treasures of knowledge related to research on mixing coffee with various herbs that can enrich similar research related to brewing coffee.

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