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Quality analysis of herbal teabags as functional drink

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Abstract - The potential for diversification of herbal drinks has increased along with a healthy lifestyle. This study aims to develop herbal drinks in the form of teabags that are practical and economical in terms of proportion and selling price. There were seven herbal tea samples tested with the proportion of spices such as mangosteen peel, ginger, lemongrass, kersen leaves, lime leaves (P1 = 1:1:1:1:1:1), (P2 = 1:2:1:1:1:1:1:1), (P3 = 1:1:2:1:1:1:1:1), (P4 = 1: 1:1:1:2:1:1:1:1), (P5 = 1:1:1:1:1:2:1:1), (P6 = 1:1:1:1:1:2:1), and (P7 = 1:1:1:1:1:1:1:2) The hedonic test method was used to obtain the best results based on the quality of herbal tea with colour, aroma, and taste parameters. The sample respondents consisted of 100 MSME assistants. The results showed that the best results with the composition P3 = 1:1:2:1:1:1:1 in terms of aroma and flavour of herbal teabags. Meanwhile, in terms of the importance of herbal teabags, panelists considered the colour aspect to be the most important factor, followed by the taste and aroma of herbal teabags. Meanwhile, a selling price of IDR 12,500/pack was obtained. The results of this study indicate that herbal teabags can be accepted by the market so further research needs to be done related to chemical content tests.

Keywords: functional drink, herbal teabags, quality analysis

1 Introduction

Technology and innovation in food products continue to develop following the interests of people in the era of thinking that is principled in the "Back to nature" lifestyle by utilising natural ingredients. The utilisation of medicinal plants has long been known by the Indonesian people as an effort to overcome health problems [1] The term functional beverage is a drink that contains ingredients that can improve health status and prevent certain diseases. Some of the expected physiological functions of functional beverages are to prevent disease, increase endurance, slow down the aging process [2]. Various kinds of functional beverages continue to be developed, one of which is herbal teabags from various spices. Herbal teabags are generally made from a combination of ingredients such as dried leaves, seeds, wood, fruit, flowers and other plants that have benefits [3]. The purpose of making herbal teabags is so that they can be consumed as practical healthy drinks without disrupting daily routines and still maintaining a healthy body. Herbal teabags made from mangosteen peel, red ginger, lemongrass, kersen leaves, orange leaves and cloves are expected to enhance the flavour of each ingredient used without reducing its efficacy[4].

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Kersen *(Muntingia calabura L.*) is one of the tropical plants found in Indonesia. The existence of kersen plants is very abundant. This is because kersen plants are easy to grow anytime and anywhere without knowing the harvest season [5]. Kersen plants can also usually be found among the ruins of houses. Previous study [6] stated that the kersen plant is one type of plant that has been used by the community for generations because of its medicinal properties. Traditionally, this plant is believed to be able to cure various diseases such as diabetes, gout, jaundice, prevent cancer, and maintain liver and kidney health [7]. The part of the kersen plant that is usually utilised is the leaves. Based on the belief of the Kuansing community, kersen leaves can be used as antidiabetes by boiling and drinking [8]. The belief has been passed down from generation to generation by using 3 pieces of kersen leaves, 7 pieces, 14 pieces or 21 pieces dissolved in one glass of water.

Meanwhile, the skin of mangosteen fruit has a smooth outer surface that is 4-8 mm thick, hard, brownish purple on the outside and purple on the inside in old fruit, and contains a bitter yellow sap [9]. Substances contained in mangosteen peel include xanthones, tannins, anti-inflammatory and anti-cancer. Indonesia itself is one of the countries rich in spices known since long ago, as it is known that many spices contain components of bioactive compounds so that they have the potential to produce health products that can be processed, one of which is a healthy powder drink that can improve health status, maintain body immunity, prevent various diseases, product quality can be maintained, easily dissolved, practical, and without preservatives [10]. Various studies on the manufacture of herbal teabags prove that spice plants such as ginger, lemongrass, and cloves are agricultural commodities that contain high antioxidants and bioactive compounds, namely phenolic and flavonoid compounds that can neutralise and reduce free radicals and inhibit oxidation in cells to reduce cell damage. The content of oleoresin in ginger extract (*Zingiber officinale*) with biological activities such as anti-fungal, antioxidant, antiviral, and antimicrobial [11]. Lemongrass can remove harmful substances from the body and reduce fever, while ginger can prevent free radicals that can damage body cells. Ginger contains anti-inflammatory and antioxidants that can strengthen immunity [12].

2 Materials and Method

2.1 Research design

The type of research used is experimental. Experimental research is a research method used to seek the effect of certain treatments on others under controlled conditions [13]. In this study, experiments were carried out to make herbal teabags using mangosteen peel, ginger, lemongrass, kersen leaves, orange leaves and bay leaves.

2.2 Treatment Design

The design used in this research is the Complete Randomized Design (CRD) method. The design model used is as follows:

$$Yij = \mu + Ƭi + Ɛij \quad (1)$$

Description:
Yij : Observation value of the i-th and j-th treatments A and B
μ : General mean
Ƭi : Effect of i-th tea powder concentration
Ɛij : Effect of the addition of the i-th and j-th A and B powders

In one package of herbal teabags, the net weight specified is 5 grams/bag. The herbal tea ingredients used are mangosteen peel, ginger, lemongrass, kersen leaves, orange leaves, bay leaves

consisting of P1 = 1:1: 1:1:1:1:1:1, P2 = 1:2:1:1:1:1:1:1, P3 = 1:1:2:1:1:1:1:1, P4 = 1:1:1:2:1:1:1, P5 = 1:1:1:1:2:1:1, P6 = 1:1:1:1:1:1:2:1, P7 = 1:1:1:1:1:1:1:2.

2.3 Research Procedure

Advanced research in the manufacture of herbal tea bags begins with the sorting of mangosteen peel, ginger, lemongrass, kersen leaves, orange leaves, and bay leaves. Followed by cleaning and cutting mangosteen peel, ginger, lemongrass, kersen leaves, orange leaves, bay leaves. The next step is drying the mangosteen skin, ginger, lemongrass, kersen leaves, orange leaves, bay leaves in the oven at 50°C for 24 hours each, followed by pulverising using a blender. The next step is sieving mangosteen skin, ginger, lemongrass, kersen leaves, orange leaves, bay leaves using a 100 mesh sieve. Followed by weighing and mangosteen skin, ginger, lemongrass, kersen leaves, orange leaves, bay leaves Packaging using osmo filter paper. Ended with brewing herbal teabags, then organoleptic tests on the colour, aroma, and taste of herbal teabags.

2.4 Observation Parameters

The observation parameters that will be observed in this study are sensory tests in the form of taste, colour, and aroma of the herbal spice tea that has been produced. The sensory test used is the hedonic type to determine the level of liking or feasibility of a product so that it can be accepted by panellists (consumers). The test method carried out is the hedonic scale method (favourability test) including: colour, aroma, taste of the resulting product. There were 100 panelists in this study, consisting of 10 expert panelists and 90 semi trained panelists. In this method the panelists were asked to give an assessment based on the level of liking for herbal tea including colour, aroma, taste and overall liking for the product tested.

2.5 Data collection technique

In this herbal tea research, data collection was carried out using observation techniques. Observation is an activity to find data that can be used to provide a conclusion or diagnosis [14]. Something is called observation if it has a purpose, seeing, observing and observing a behaviour. The observation method in this study is to make direct observations using the five senses with hedonic testing which includes a, colour, taste and aroma of herbal tea [15].

2.6 Data Collection Instrument and analysis technique

In this method the panellists were asked to give an assessment based on the level of liking. The scores used are 4 (like), 3 (quite like), 2 (less like), 1 (dislike). Data analysis was carried out using multiple anava types, then processed using the SPSS 26 programme.

3 Results and discussion

3.1 Test Sample Results

The results of the herbal teabag product engineering test can be seen. in. figure 1 as below:

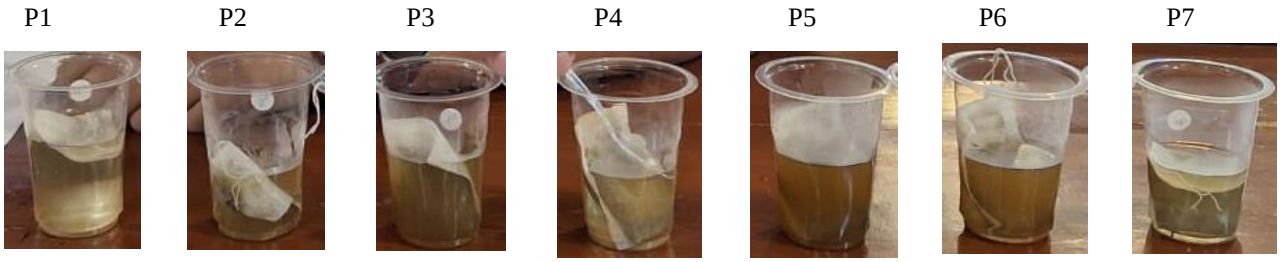

Fig. 1. Herbal Teabag Test Sample

From the results of the herbal teabag engineering test, it is known that the product is good enough, but the concentration of herbal teabags with 1% mangosteen peel composition produces an aroma that tends to be languorous, so that the aroma of herbal teabags is not too strong. The flavour tends to be dominated by the flavour of ginger. The flavour of the engineering test results also tended to be ginger 1% and lime leaves 1%.

3.2 Hedonic Test Results

Saleh (2004) states that the assessment of a food product needs to use the ability of the sensory organs in providing responses in distinguishing colour, aroma, texture, viscosity, taste, and overall the results are obtained as follows:

3.2.1 Colour

The survey on the colour level conducted on 100 panelists is presented in the following diagram.

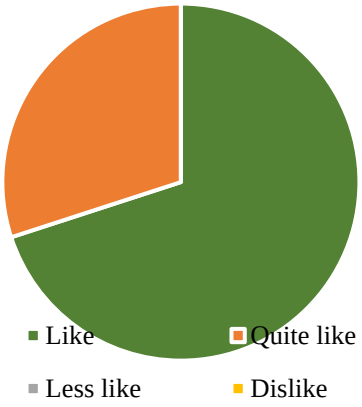

Fig. 2. The results of the assessment of the liking level of the colour of herbal tea bags

The diagram above shows that 70% (70 panellists) gave a like statement and 30% (30 panellists) gave a quite like statement. This is because colour is an important criterion in the assessment of consumers and the herbal tea bags produced have an attractive colour, namely greenish brown from kersen leaves. In addition, in line with the statement put forward by [16] that the colour produced by kersen leaves includes natural dyes that are widely used because they have an attractive purplish green pigment colour.

3.2.2 Aroma

The survey on the level of aroma conducted by the author on 100 panellists is presented in the following diagram.

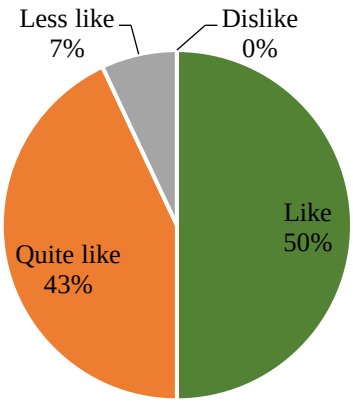

Fig. 3. The results of the assessment of the level of favourability of the aroma of herbal tea bags

The results of the survey of the level of aroma preference of the panellists that the authors have conducted found that 50% (50 panellists) gave a statement of preference, 43% (43 panellists) gave a statement of moderate preference and 7% (7 panellists) gave a statement of less preference. The assessment of liking the aroma of herbal teabags as much as (50%). This can be caused by the combination of various spices that vary to produce a unique and attractive aroma [17], resulting in the dominance of herbal aromas where people easily accept herbal tea products [18].

3.2.3 Flavour

Based on the survey on the level of taste conducted by the author on 100 panellists, it is presented in the following diagram.

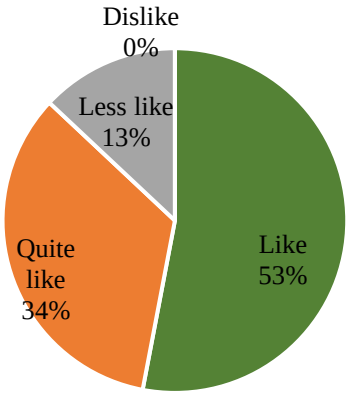

Fig. 4. The results of the assessment of the level of liking for the taste of herbal teabags

The results of the panellists' level of liking for the taste that the authors have done found that 53% (53 panellists) gave a like statement, 33% (33 panellists) gave a moderately like statement and 13% (13 panellists) gave a less like statement. It is known that the acquisition of survey results on the level of taste preference for herbal teabags is quite a lot due to the combination of ginger and orange leaf flavours [19], and the bay leaf juice in herbal teabags is balanced, but there are still panellists who do not like the languorous taste of mangosteen peel.

3.2.4 Overall Performance

The results of the survey on the overall level conducted by the author on 100 panellists are presented in the following diagram:

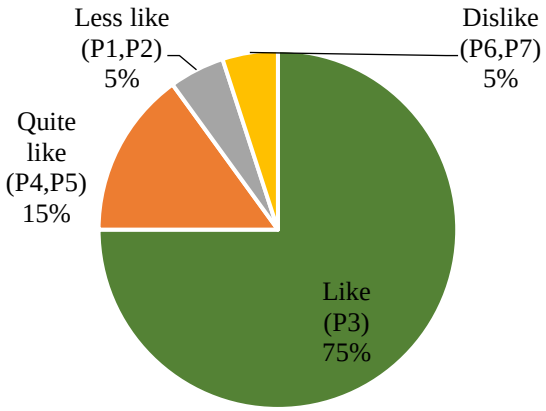

Fig. 4. The Assessment for The Overall Liking of Herbal Teabags

3.2.5 Determination of Selling Price

The calculation of the selling price of herbal tea bags uses a standard cost sale calculation. Based on observations from several hotels, the fc% used for baverage is 21%-35%. From one herbal teabag recipe, the research results obtained a finished product of 100 bags with a production cost of rp 18,660 in this study, the fc used was 30%. Then the selling price of the smoothie is as follows:

Selling Price = fc (%) x fc (rp) = 100/30 x rp 18,660 = rp. 62,200 / recipe (100 bags)

Selling Price/Pack = 20/100 x rp. 62,200 = idr 12,490 /pack

The calculation results obtained a selling price of idr 12,490 per pack, but to simplify the price calculation, the price is rounded up to idr 12,500. Thus it can be concluded that the selling price of herbal teabags is idr 12,500 / pack with a size of 200g.

4 Conclusions

The results of the engineering showed that 70% of the panelists liked the colour of the herbal tea, 50% of the panelists liked the aroma, 53% of the panelists liked the taste, and 70% of the panelists liked it overall. The selling price for herbal tea is known to be IDR 12,500/Pack (200 grams). Recommendations for further research are testing the water content and shelf life of herbal tea. In addition, it can be followed up to do a proximate test to determine the nutritional accuracy of herbal tea.

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