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Moringa Jamu
(Recipe Formulation, Hedonic Test And Nutrition)

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ABSTRACT

Consumption of natural immune-boosting foods/drinks without preservatives such as jamu is a very good thing. Jamu processing is carried out from generation to generation based on ancestral recipes, and uses existing natural ingredients. However, over time the existence of jamu began to decline due to the circulation of modern medicines. In fact, jamu is not just a traditional medicine, but one of the efforts to maintain the biodiversity of the Indonesian nation. Therefore, it is important to bring jamu to the family menu in order to maintain the existence of jamu and its development. In addition, during the pandemic, people requires strong stamina, hence the researchers are interested in conducting research on jamu, especially moringa jamu, because moringa jamu is not yet common in the community. The author conducted an experiment on processing moringa jamu to get a recipe formulation, hedonic test (preference test) on 100 panelists with 3 hedonic scales namely very like, like, and dislike, as well as nutrition tests (carbohydrates, protein, fat, calories, vitamin C, and antioxidants). The results of this study are the formulation of the moringa jamu recipe, namely 100 g of moringa leaves, 1 liter of water, 20 g of tamarind, 100 g of brown sugar, 5 g of salt, lime (optional). The method of processing moringa jamu is by heating 500 ml of water, tamarind, brown sugar, and salt, then set aside, blend the moringa leaves, add 500 ml of water, and then heat it, mix them and then filter. The results of the hedonic test of moringa jamu, namely 61% of panelists said they really liked it, 39% of panelists said they liked it, and 0% dislikes it. The nutritional content of moringa jamu is 8.43% bw of carbohydrates, 1.41%bw of protein, 0.05% bw of fat 39.79 kcal calories.

Keywords: *Jamu; Moringa; Recipe; Hedonic; Nutrition.*

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1. Introduction

The World Health Organization (WHO) has declared a world pandemic since March 11, 2020, namely Corona Virus Disease 2019 (Covid-19) (PDPI et al., 2020). This case was first reported in China on December 31, 2019 and has since spread around the world.

This coronavirus is rapidly spreading over the world, especially in Indonesia. The number of Covid-19 cases has risen and fallen since it was first reported in Indonesia. The transmission of Covid-19 in Indonesia is spreading throughout areas and countries, with a surge in the number of cases and/or deaths (Ministry of Health, 2020).

This pandemic has a wide-ranging influence. Of course, no one knows when this virus will vanish or continue to exist, so measures must be made to limit its spread, as there is no effective drug or vaccination for it. So that the government can develop a new normal in the Covid-19 situation, meaning, the ability to adjust through changes in new lifestyles (Ministry of Health, 2020). As a result, in the new normal age, health protocols have been established by the federal and state governments. The essential actions of wearing masks, often washing hands/ applying handsanitizer, and keeping a distance (physical distancing/social distancing) are prioritized in this protocol to avoid the transmission of Covid-19 (Kemenparekraf, 2020). Of course, the government's health protocol must be followed appropriately, in a disciplined and consistent manner.

We must be able to maintain a healthy body in addition to implementing the health protocols mentioned above. Because Covid-19 is caused by a virus that can strike at any time, our bodies must have excellent immunity to resist other viruses so that they do not make our bodies sick during this pandemic. During this epidemic, it is critical to have a healthy diet, frequent physical activity/exercise, appropriate relaxation, and excellent mental health.

Various types of vitamins circulating and distributed in the market are in high demand to sustain the body's immunity throughout this pandemic. It would be ideal if we could consume natural immune-boosting foods and beverages that were free of preservatives, such as herbs (traditional drinks). Jamu is made using natural substances and is passed down from generation to generation based on ancestral formulas. However, when modern medicines became more widely available, the use of herbal therapy began to wane. Jamu is not only a form of traditional medicine, but it is also a part of the Indonesian government's attempts to preserve the country's biodiversity. As a result, it is critical to include jamu on the family table in order to preserve jamu's existence and development. Furthermore, researchers are interested in conducting research on jamu, especially moringa jamu because moringa jamu it is not yet widely used in the community during the present pandemic, which necessitates high to boost stamina. Herbs derived from turmeric, ginger, kencur rice, galangal, and other spice ingredients are widely available in the market.

Moringa leaves have been proven to contain a variety of pharmacological properties, including antibacterial, anti-inflammatory, and antinociceptive properties (Eleirt U *et al*., 2007). (Sashidara KV *et al*., 2009). Through the mechanism of DPPH radical inhibition, the ethyl acetate fraction of Mmoringa leaves displays antioxidant activity (Dellima BE *et al*., 2014). Given Mmoringa's immense potential as a medicinal plant, it is required to conduct research into jamu (traditional beverages) in order to develop an acceptable recipe formulation, which will be followed by hedonic testing and nutritional analysis. Moringa leaf preparations were prepared created in the form of effervescent powder, Mmoringa leaf extract (Rusita, YD and Regia DR, 2019), and Mmoringa leaf syrup

mixed with rosella flower extract based on prior study (Rusita, YD and Regia DR, 2019). (Ananta *et.al*., 2019). There has been no research that processes Mmoringa leaves into jamu or in Bali as Loloh as a result of this search. As a For that reason, the authors are interested in processing Mmoringa into jamu in order to achieve the suitable recipe formulation, as well as conducting a hedonic test (preferred preference test) and evaluating the nutritional content of Mmoringa jamu (carbohydrates, protein, fat, calories, antioxidants, and vitamin C).

2. Literature Review

In Indonesia, jamu is often utilized as jamu or as the consequence of combining natural substances with health advantages. Jamu serves not only as medicine, but also as a means of maintaining physical fitness and preventing disease. Jamu is also widely used to assist help children gain an appetite. Jamu is also known as a home remedy since it is typically manufactured at home with readily available materials such as turmeric, kencur aromatic ginger, ginger, galangal, and other rhizomes or plants. Jamu is still regarded as a treasure trove of indigenous knowledge, particularly in the Keraton or palace environment settings like such as the Keraton Yogyakarta and Surakarta palaces. Herbal Jamu medication has also been made into capsules, powders, and liquid drinks as a result of technical advancements. Herbs eaten Jamus that are consumed at homes or in a palatial environment, on the other hand, are fresher since they are preservative-free and only directly consumed once they are served. In Indonesia, jamu is more than just a useful traditional herb. Previous generations, on the other hand, have taken steps to conserve the environment. Natural jamu will encourage attempts to replant the plants that are used as ingredients. Fresh herbs jamu are sold around the street by carrying being carried or jamu gendong carrying in various locations, in addition to being prepared at home or in the royal surroundings. Jamu in the shape of drinks, such as turmeric tamarind and kencur rice, is usually sold around the world by jamu gendong sellers carrying (Army R., 2018).

Jamu is a traditional medicine that is traditionally administered in the form of steeping powder or liquid containing all of the plant constituents that make up the jamu. In general, this type is created using traditional heritage recipes that include a wide variety of medicinal herbs, ranging from 5 to 10 different types or even more. This group does not require scientific evidence in order to be clinical, but empirical evidence is sufficient. Jamu has been utilized for centuries, even hundreds of years, and has demonstrated its safety and effectiveness for specific health conditions. Jamu, in addition to phytopharmaca, can be interpreted as traditional medicine that is delivered in the form of steeping, pills, or solutions. Jamu, in general, is manufactured using hereditary recipes and does not go through the same process as phytopharmaceuticals. Herbal medication must meet a number of requirements, such as: (a) Safe to consume, (b) Based on empirical research, it is effective (experience), (c) Observe the applicable quality standards. (Parwata, 2016)

3. Materials and Methods

Moringa jamu is the subject of this study (prescription formulation, hedonic test, and nutrition). The experimental processing of Mmoringa jamu is carried out in the Bali Tourism Polytechnic's Politeknik Pariwisata Bali kitchen, hedonic testing are carried out throughout the Bali Tourism Polytechnic campus, and nutrition tests are carried out at Udayana University's Analytical Laboratory, Jimbaran Campus, Badung Bali. There are two sorts of data in this study: qualitative and quantitative. For this study's qualitative data is presented in the form of experimental results and hedonic tests of Moringa jamu. Quantitative information in the form of total nutritional content of Mmoringa herbal jamu medication is also available (carbohydrates, protein, fat, calories,

antioxidants, and vitamin C).

To achieve the formulation of the moringa jamu recipe, the author conducted a trial experiment on the processing of moringa jamu. Following the processing of the moringa jamu, the authors asked the panelists to rate their preference for the moringa herbal jamu medication. A total of 100 panelists assessed this jamu to be a form of untrained panelist (academics of the Politeknik Pariwisata Bali Bali Tourism Polytechnic campus). A hedonic test sheet will be presented to the panelists (favorite preference test). The author employs three hedonic scales on the sheet: Strongly Like, Like, and Dislike. Moringa jamu samples were brought to the lab to be evaluated for carbs, protein, fat, calories, vitamin C, and antioxidants.

The data analysis technique in this research is descriptive qualitative. The results of experiments, hedonic tests, and nutrition are arranged systematically, presented in the form of narratives and tables, and conclusions are drawn from the research results. For the results of the hedonic test, the percentage of who chooses Strongly Likes, Likes and Dislikes is are calculated. For the nutritional results of moringa jamu, the author compares the nutritional value studies of other traditional Balinese drinks, presented in tabular form.

4. Results and Discussion

4.1 Experiment Data of Moringa Leave Jamu

After several experiments, we found out the recipe formulation of the jamu according to the author's taste. The recipe formulation and the method of processing moringa leaves jamu are as follows:

Table 1. Moringa Leaves Jamu Recipe

No	Ingredients	Quantity
1.	Moringa Leaves	100 g
2.	Water	1 liter
3.	Tamarind	20 g
4	Brown sugar	100 g
5	Salt	5 g
6	Lime	(optional)

Source: Author (2021)

The method of processing moringa leaves jamu are as follows:

a. Preheat 500 ml of water, tamarind, brown sugar, and salt, then set aside
b. Blend the moringa leaves, add 500 ml of water, and the boil it
c. Mixed the result from step a and b then filtered

Figure 1. Exksperiment of Moringa Leaves Jamu

Source : Author's documentation (2021)

4.2 Hedonic Test Data (Test of Preference) for Moringa Leaves Jamu

The processed Mmoringa leaves Jamu were distributed to 100 panelist for preference test. The panelist was untrained and Panelis as given hedonic test sheet (favorite preference test). On the sheet there was The test covered three 3 hedonic scales, namely Strongly Like, Like, and Dislike. Panelist have tested and voted for their choices. The documentation of hedonic test and its result of hedonic test are as follows:

Figure 2. Hedonic test of Moringa Leaves Jamu

Source : Author's documentation (2021)

Tabel 2. Hedonic Test Data Recapitulation of Moringa Leaves Jamu

Moringa Jamu Like Level	Number of Panelists Who Assessed	Percentage (%)
Strongly like	61	61
Like	39	61
Dislike	0	39
Total	100	100

Source: Author Data (2021)

The findings of the moringa jamu preference test revealed that the majority of the panelists said they really enjoyed it (61%) and liked it (39%) and that no one chose the dislike option claimed they didn't like it (0 %).

4.3. Hedonic Test Data (Test of Preference) for Moringa Leaves Jamu

Jamu Nutrition Test Results Researchers from KelJamu Moringa tested was conducted at Udayana University's Analytical Laboratory on Jl. Kampus Bukit Jimbaran Jimbaran Hill Campus in Bali. The nutritional test of the moringa jamu yielded the following results:

Tabel 3. Moringa Jamu Nutritional Values

No	Parameter	Method	Sat	Result
1	Vitamin C	Titrimetry	%	0.02
2	Antioxidant	Spectrophotometry	%	78.45
3	Calories		Kcal	39.79
4	Carbohydrates	Spectrophotometric	%bw	8.43
5	Protein	Khjeldahl	%bw	1.41
6	Fat	Gravimetry	%bw	0.05
7	Ash Content	Gravimetry	%bw	0.56
8	Water content	Gravimetry	%	89.55

Source: Unud Analytical Lab (2021)

The researchers compared the nutritional content of moringa jamu to the nutritional findings of other traditional Balinese drinks with similar processing methods.

Tabel 4. Comparison of the Nutritional Content of Moringa Jamu with Traditional Balinese Beverages Tradisional Bali

No	*Types Of Loloh*	*Protein (%)*	*Fat (%)*	*carbs (%)*	*Ref*
1	*Loloh tibah*	0,39	0,05	0,41	Yusa & Suter (2013)
2	*Loloh kayu manis*	0,62	0,09	0,06	Yusa & Suter (2013)
3	*Loloh temutis*	0,38	0,13	1,46	Yusa & Suter (2013)
4	*Loloh temopoh*	0,30	0,28	1,22	Yusa & Suter (2013)
5	*Loloh Cemcem*	0.30	0.11	9.67	Trisdayanti (2017)
6	*Loloh bluntas*	0.12	0.0064	0.7284	Yusasrini & Puspawati (2013)
7	*Loloh sembung*	0.0956	0.0151	0.7095	Yusasrini & Puspawati (2013)
8	*Jamu Kelor*	1.41	0.05	8.43	Peneliti (2021)

Source : Processed Data (2021)

It can be observed from the table above that:

a. Protein: When compared to other traditional Balinese drinks, herbal moringa jamu has the greatest protein level (1.41 percent). High protein content is helpful for developing cells and body tissues, as well as increasing body immunity.

b. Fat: Herbal moringa jamu has a lower fat content than loloh cinnamon, loloh temutis, loloh temopoh, and loloh cemcem. People who want to limit their fat consumption should choose foods with a low-fat content.

c. Carbohydrates: Herbal moringa jamu has a lower carbohydrate content than loloh cemcem but a larger carbohydrate content higher than other loloh. High carbohydrate content can offer consumers with a source of energy.

In addition to the nutritional value listed above, Mmoringa is high in antioxidants, with a concentration of 78.45 percent. Antioxidants could ward off free radicals, antiaging, and boost immunity are all benefits of antioxidants. Moringa jamu which is derived from Mmoringa leaves is beneficial as an anti-diabetic and antioxidant (Jaiswal *et al*., 2009; Pari *et al*., 2007), and this has been demonstrated from the results of this study. Moringa jamu is good to drink to boost body immunity, especially during a pandemic such as the covid-19.

5. Conclusions

The moringa jamu recipe calls for 100 grams of Mmoringa leaves, 1 liter of water, 20 grams of tamarind, 100 grams of brown sugar, 5 grams of salt, and a pinch of lime (optional). Moringa leaves are blended with 500 ml of water, tamarind, brown sugar, and salt, then left aside. Moringa leaves are blended with 500 ml of water, then heated, then mixed with the other ingredients the results 1 and 2 and filtered. The hedonic test of moringa jamu yielded the following results: 61 percent of panelists said they greatly enjoyed it, 39 percent said they liked it, and none of them (0 percent) disliked it. said they didn't like it. Moringa herbal jamu medication contains 8.43 percent by weight carbohydrates, 1.41 percent by weight protein, 0.05 percent by weight fat, 39.79 kcal calories, 78.45 percent antioxidants, and 0.02 percent vitamin C.

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