CHAPTER IV

RESULT AND DISCUSSION

4.1 Product Result

Kombucha is a plant-based fermented beverage that contains probiotic bacteria such as lactic acid bacteria (LAB). This research was conducted to prove the potential of probiotics in LAB isolates of kombucha tea leaves and robusta coffee leaves with various concentrations. This research used a completely randomized design (CRD). The variables tested were the measurement of total lactic acid bacteria, total acid, and probiotic characterization of LAB isolates (LAB resistance to low pH and bile salts, and antibacterial activity test). The results were analyzed and discussed using ANOVA with a significance level of $P < 0.05$ only for total acid and descriptive analysis on microbiological response. The best probiotic potency was selected using the multiple attribute method. The results showed that LAB isolates from kombucha tea leaves and robusta coffee leaves with various concentrations had resistance to pH 2 and pH 3, resistance to bile salts 3%, and antibacterial activity against Staphylococcus aureus and Escherichia coli bacteria. The LAB isolate of kombucha robusta coffee leaves at a concentration of 0.6% has the best probiotic potential. (Sovian,2021).

According to the Tourkecytes (2011), the wuluh plant contains sugar compounds, phenolic, calcium ions, amino acids, citrote acids, vitamins and 3-o-h-d-glucoside. Also, the wuluh saplings contain flavonoid and triteroid compounds that can act as antibacterial. Muchthus et al. (2013) says the wuluh berries also contain organic acids.

To become tea, flowers from the wuluh berries take longer than any other tea. If black tea takes 3 minutes, Tea from the wuluh blossom takes 10 minutes to make a good tea. In addition, the tea from the wuluh flowers has a different flavor than the usual tea, the tea from the wuluh blossom has acid flavour.

4.2 Nutrition Fact

4.2.1 Nutrition table

The nutritional value of wuluh blossom is as follows:

Table 4. 1 Nutrition Value Wuluh Blossom per 100gr

Calorie (kcal)	36
Protein(g)	0,7
Fat(g)	1.3
Carbohydrate(g)	2,8
Fiber(g)	0,7
Calcium(mg)	12
Iron(mg)	0,4
Potassium(mg)	80
Sodium(mg)	4

4.2.2 Nutrition table

The nutritional value of kombucha is as follows:

Table 4. 2 Nutrition Value Kombucha per 100 ml

Calorie (kcal)	13
Protein(g)	0
Fat(g)	0
Carbohydrate(g)	3,2
Fiber(g)	0
Sugar (g)	3
Protein (g)	0
Potassium(mg)	15,6
Sodium(mg)	6

4.2.3 Nutrition Calculation

Table 4. 3 Nutritional Value of Ingredients used in the recipe for kombucha

Ingredients	**Calories (kcal)**	**Carbohydrate (g)**	**Protein (g)**	**Fat (g)**	**Sugar (g)**	**Fiber (g)**	**Sodium (mg/100g)**
Wuluh Blossom (2 gr)	0,72	0,056	0,014	0,034		0,014	0,08
Rock Sugar (100 gr)	89	104	0	0	104	0	
Cinnamon (1 gr)	2,61	0,79	0,038	0,031	0,021		0,26
Scooby (9,5 cm)			3,6			2,4	
Starter tea (200 ml)							
Water (1000 ml)	0	0	0	0			
Total	**94,33**	**104,85**	**3,65**	**0,068**	**104,021**	**2,414**	**0,34**

4.2.3 Nutrition Label

Nutrition Facts

1 servings per container

Serving size **Bottle (250ml)**

Amount Per Serving

Calories **25**

	% Daily Value*
Total Fat 0g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 0mg	**0%**
Total Carbohydrate 0g	**0%**
Dietary Fiber 0g	**0%**
Total Sugars 26g	
Includes 0g Added Sugars	**0%**
Protein 0g	**0%**
Vitamin D 0mcg	0%
Calcium 0mg	0%
Iron 0mg	0%
Potassium 0mg	0%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Figure 4. 1 Nutrition Fact of Kombucha

4.3 Food Safety and Packaging

4.3.1 Processing and storage temperature

Kombucha is a low alcoholic beverage with high content of bioactive compounds derived from plant material (tea, juices, herb extracts) and metabolic activity of microorganisms (acetic acid bacteria, lactic acid bacteria and yeasts). Currently, it attracts an increasing number of consumers due to its health-promoting properties. This review focuses on aspects significantly affecting the bioactive compound content and biological activities of Kombucha tea. The literature review shows that the drink is characterized by a high content of bioactive compounds, strong antioxidant, and antimicrobial properties. Factors that substantially affect these activities are the tea type and its brewing parameters, the composition of the SCOBY, as well as the fermentation parameters. On the other hand, Kombucha fermentation is characterized by many unknowns, which result, inter alia, from different methods of tea extraction, diverse, often undefined compositions of microorganisms

used in the fermentation, as well as the lack of clearly defined effects of microorganisms on bioactive compounds contained in tea, and therefore the health-promoting properties of the final product. The article indicates the shortcomings in the current research in the field of Kombucha, as well as future perspectives on improving the health-promoting activities of this fermented drink. (Hubert, 2021)

Kombucha is produced both at homes, handcrafted in small enterprises, and on large, commercial scales. Kombucha Brewers International (KBI) is global non-profit organization of commercial Kombucha companies involved in the global promotion of the drink and protection of producers. Most of the companies involved in the production and distribution of Kombucha are located in North America: 134 companies are based in the United States, 28 in Canada. In Europe, most producers can be found in Spain and the United Kingdom.

4.3.2 Self Life

Raw kombucha should be stored in cold temperatures such as in the refrigerator. While in the fridge, the low temperatures effectively stop further fermentation hence the brew can last longer. The reduced temperature deactivates the enzymes responsible for controlling the metabolism of the yeast and bacteria culture. The yeast cells slow down the breakdown of sugar which means less alcohol is produced which in turn means the bacteria cells have less alcohol to feed on which results in a reduced rate of acetic acid production. Kombucha should be stored in a cool environment and kept away from both extreme heat and direct sunlight. Ideal temperature for storing kombucha should range between 50°F to 75°F (10°C to 25°C). At colder temperatures, the bacteria will slow down their activity and at warmer temperatures growth may continue, but off flavors may develop due to high sugar levels.

4.3.3 Product Packaging

Filtration of the product and packaging in unit containers (bottles, cans), Kombucha may undergo further processes such as pasteurization to ensure microbiological stability of the product. Otherwise, it may lead to further changes in the composition by metabolic activity of SCOBY microorganisms.(Hubert,2021) In order to ensure that your kombucha product delivers the highest quality taste and texture for customers, the choice of packaging is critical. The wrong type of packaging can have a profound effect on flavor and can even impact shelf life. It's important to select containers that are designed to withstand pressure without breaking, as kombucha is a fermented beverage that contains carbon dioxide from newly produced alcohols. Properly sealed jars provide an effective barrier against oxygen and light, preserving carbonation and protecting your kombucha from contamination. Glass bottles provide a premium feel for customers whilst maintaining longevity in storage. The container size should depend on the customer's preference or occasion – 16 fl oz bottles are great for day-to-day use, while 32 fl oz bottles make ideal party size offerings. Providing multiple sizes allows customers more flexibility in their purchases so it's often worth bearing this in mind when defining your packaging options.

Figure 4. 2 Glass Bottles 250 ml

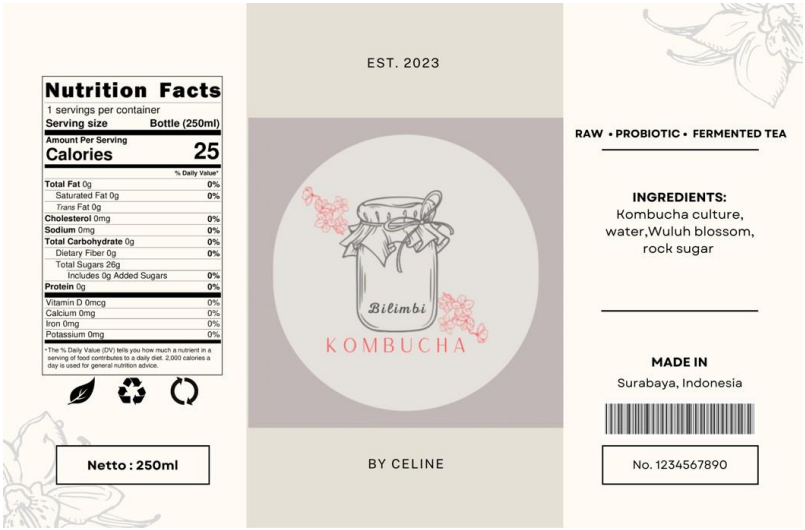

Figure 4. 3 Logo

4.4 Financial Aspect

4.4.1 Product Cost (Variable Cost, Overhead Cost, Fixed Cost)

Product cost is calculated based on the total of all cost per month. The costs consist of labour cost, raw material cost, packaging cost, and utility cost. The labour cost is considered based on monthly working days, which are 25 days per month. As for raw material, the quantity of raw materials is counted as 20 recipes per week, which are 80 portions per week or 320 portions per month.

1. Start–Up Capital

Table 4. 4 Start Up Capital

Tools and Equipment	Quantity	Price (/unit)	Sub Total
Sauce Pan	2	Rp 200.000	Rp 400.000
Spoon	10	Rp 3000	Rp 30.000
Jar	10	Rp 30.000	Rp 300.000
Dehydrator	1	Rp 500.000	Rp 500.000
Measuring Cup	1	Rp 30.000	Rp 30.000
Tea-Cloth	10	Rp 10.000	Rp 100.000
Tea bag	100	Rp 100	Rp 10.000
TOTAL			**RP 1.370.000**

2. Labour Cost

Table 4. 5 Labour Cost

Occupation	**Personel**	**Salary (/month)**	**Sub Total**
Assistant helper	1	Rp 2.000.000	Rp 2.000.000
Cleaning Service	1	Rp 1.500.000	Rp 1.500.000
TOTAL			**Rp 3.500.000**

3. Packaging Cost

Table 4. 6 Packaging Cost

Packaging	**Quantity**	**Price(/unit)**	**Sub Total**
Glass Bottles	300	Rp 4000(/pcs)	Rp 1.200.000
Sticker	300	Rp 200(/pcs)	Rp 60.000
Plastic bag	300	Rp 10.000(/20 pcs)	Rp 150.000
TOTAL			**Rp 1.410.000**

4. Utility Cost

Table 4. 7 Utility Cost

Facility	**Quantity**	**Price/(unit)**	**Sub Total**
Gas	3 kg	Rp 15.000/kg	Rp 45.000
Water	15 L	Rp 2000/ (m3)	Rp 30.000
Electricity	10 kWh	Rp 1.500 / (kWh)	Rp 15.000
TOTAL			**Rp 90.000**

5. Raw Material Cost

Table 4. 8 Raw Material Cost

Raw Materials	**Quantity**	**Price (/unit)**	**Sub Total**
Wuluh blossom	50 g	Rp 2000/(2 gr)	Rp 50.000
Rock Sugar	2000g	Rp 5000/ (100 gr)	Rp 100.000
Cinnamon	100 g	Rp 140/ (1 gr)	Rp 14.000
Scooby and Starter Tea	1000 ml	Rp 29.000/ (200ml)	Rp 145.000

Water	19 L	Rp 2.600/ (1 L)	Rp 50.000
TOTAL			**Rp 359.000**

6. Rent Cost

Table 4. 9 Rent Cost

Facility	**Size**	**Price**	**Sub Total**
Stand	2m x 2m	Rp 2.000.000	Rp 2.000.000
TOTAL			**Rp 2.000.000**

7. Total Cost

Fixed Cost = Labour Cost and. Rent Cost Variable Cost

= Raw Material Cost, Packaging Cost, and Utility Cost

Total Cost (/month) = Labour + Raw Material + Packaging + Utility + Rent Cost

= Rp 3.500.000 + Rp 359.000 + Rp 1.410.000

+ Rp 90.000 +Rp 2.000.000

= **Rp 7.359.000**

4.4.2 Selling Price

Product price $= \frac{Total\ cost(/mont\text{-})}{Total\ product\ un3ts(/mont\text{-})}$

$= \frac{Rp5.789.:::}{7;:\ port3ons}$

=Rp 23.000

Product Selling Price= Product price $+ {}^{!}_{pro>3t}\ product\ pr3ce \times$ "

= Rp 23.000 +(23.000 x 50%)

= Rp 23.000 + 11.500

= Rp 34.500