Micronutrient analysis of ambon banana (*Musa paradisiaca*) yoghurt enriched with moringa leaves (*Moringa oleifera*) and butterfly pea flowers (*Clitoria ternatea*)

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Abstract. Yoghurts from milk fermentation by lactic acid bacteria such as Lactobacillus bulgaricus and Streptococcus thermophilus provide significant health benefits, particularly for digestive function. This study aimed to enhance the nutritional quality of Ambon banana (*Musa paradisiaca*) yoghurt by supplementing it with Moringa (*Moringa oleifera*) leaf and Butterfly pea (*Clitoria ternatea*) flower extracts. Ambon banana contains essential nutrients including protein, fiber, vitamins (C, B complex, and B6), potassium, and key minerals, while Moringa and Butterfly pea are rich in iron, calcium, magnesium, zinc, and vitamins A, B, C, D, and E, offering additional health-promoting properties. The experiment employed a Completely Randomized Design (CRD) with three extract concentrations (6 mL, 8 mL, and 10 mL). The analyzed parameters were potassium, calcium, magnesium, and zinc contents. The highest potassium levels were observed in yoghurt supplemented with 10 mL of Moringa extract (0.50%) and 8 mL of Butterfly pea extract (0.48%). The highest calcium contents were found with 6 mL of Moringa (722.57 ppm) and 8 mL of Butterfly pea (250.86 ppm) extracts. Magnesium and zinc levels peaked in yoghurt with 10 mL of Moringa (83.5 ppm; 21.38 ppm) and 6–10 mL of Butterfly pea (58.8 ppm; 18.32 ppm) extracts. These findings indicate that supplementation with Moringa leaves, and Butterfly pea flowers enhances the micronutrient composition of Ambon banana yoghurt, supporting its potential as a functional food to promote adolescent health.

1. Introduction

Yogurt is one of the example products of fermented milk that has been widely known by the public. The national standard of Indonesia explained that yogurt is a product produced through the milk fermentation process with the help of the bacteria *Lactobacillus bulgaricus* or *Streptococcus thermophllus* and bacteria sour lactate (BAL) [1] and the consortium bacteria *Lactobacillus acidophilus, Lactobacillus casei, and Bifidobacterium* [2]. Use of consortium bacteria can increase nutrition flat increased 6 times [3]. In today's era, there is a trend for combining various elements in food to increase its health properties [4]. Addition material natural Lots done innovation in making yogurt for the purpose of increasing nutrition and characteristics organoleptic product end [5]. Ambon bananas are table bananas and until the moment they are consumed in a way directly. According to Zulaikhah and Fitria Ambon bananas contains 1.2% protein, 0.3% fat, 0.8% minerals, 0.4% fiber, and 27.2% carbohydrate content Ambon banana nutrition in 100g of material [6]. Vitamins C, B complex, B6, serotonin, potassium, and other minerals are also present in Ambon bananas.

Natural materials can be used to increase the benefits of yogurt, including Moringa (*Moringa oleifera*) leaves [7]. Moringa leaves are considered as the cheapest plant that has benefits for being used as an alternative for people who experience nutritional problems. Moringa plants have higher vitamin C content than oranges, higher potassium content than bananas, more vitamin A content than carrots, more calcium content than milk, and more protein content than oranges. Butterfly pea flower (*Clitoria ternatea*) belongs to the family *Fabeaceae.* Butterfly pea flower is beneficial as an anticancer agent and can lower blood sugar levels, so this flower has potential as an herbal plant [8], [9].

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Adequate potassium intake can increase vascular compliance and reduce the activity of the renin-angiotensin system, which contributes to a decrease in blood pressure. Potassium help lower pressure blood with reduce sodium effect and relaxing blood vessels [10]. Positive charged ions, potassium, found in the cell. Blood pressure can be influenced by the amount of potassium consumed by a person. Low potassium intake will increase blood pressure, while high potassium intake can be obtained from fruits and vegetables that contain high potassium. Consumption of fruits and vegetables, which are rich in potassium, is associated with a decline in the risk of hypertension [11]. One of the most important nutrients for guarding the health of the heart is magnesium. Magnesium functions to aid muscle heart relaxation. Interaction of zinc with iron is a good in a way direct and also no direct influence on iron metabolism. Zinc plays a role in a way No direct in protein synthesis, including transport proteins iron and transferrin. Zinc plays a role in almost all metabolic processes in the body, including in the formation of red blood cells with the help of the enzyme carbonic anhydrase essential guard balance sour base. In addition, CA activity in the stomach mucosa helps in the production of a sour stomach, which is important for digestion and absorption nutrition, including the iron needed for the synthesis of hemoglobin [12].

Based on the potencies of the moringa leaves and butterfly peas flowers, this study produced a yogurt product from Ambon banana base with the addition of Moringa leaf and butterfly pea flower extracts. Then, we analyzed the nutritional content of the produced yogurt. The additional leaves and flowers extracts increased the levels of potassium, calcium, magnesium, and zinc.

2. Materials and method

2.1 Preparation of pure ambon banana

Ambon bananas are pureed before being made into yogurt. Ambon bananas are obtained in a way commercial with choose the quality good, ripe perfect, clean and intact or no there are spots. As many as 100 g of Ambon banana peel skin and cut. Cutting done with knife deng grater small for easier refinement. Before cutting the refined bananas, the blanching process is carried out at a temperature of 88 ° C for 15 s. The bananas are then refined using a mortar until an Ambon banana puree is obtained [6].

2.2 Ambon banana yogurt

Yogurt ingredients use pure milk that has been pasteurized at a temperature of *80-85* ° C. The milk is then cooled down until temperature 40 -42 ° C and the starter is added at a 1:1 ratio of 5% of the inoculated material. Materials that have been inoculated entered the bottle with a volume of 200 ml and separated based on treatment for addition butterfly pea flower extract in accordance treatment 3 and fermented in temperature room for 8 hours.

2.3 Making extract from Moringa leaf.

Leaf sample Moringa dried wind up aiming for removing water content in the material. After drying the Moringa leaf, it is placed in the oven to ensure a constant water level. Furthermore, the sample leaf dry refined using a blender and weighed and soaked in 96% ethanol. Then, we performed filtering to get results extract leaf Moringa.

2.4 Preparation for Butterfly Pea Flower extract

Butterfly pea flower sample was dried to remove water content in the material. Smoothed. After drying the Moringa leaf, place it in the oven to ensure constant water level. Stage furthermore sample leaf Moringa has dry refined using a blender and weighing and soaking using 96% ethanol. Then, we performed filtering to get results butterfly pea flower extract.

2.5 Analysis of potassium, calcium, magnesium, and zinc

Testing the potassium, calcium, magnesium, and zinc contents using AAS. The analysis of potassium content was done based on the method from AOAC. [13]. The data analysis was conducted using one way Anova.

3. Results and Discussion

3.1 Overview of Ambon Banana Yogurt Products: Moringa Leaf Extract and Butterfly Pea Leaf Extract

The Ambon banana (Musa paradisiaca) yogurt was produced through the fermentation of pasteurized milk by Lactobacillus bulgaricus and Streptococcus thermophilus, which are lactic acid bacteria responsible for the acidification, gel formation, and flavor development in yogurt. The base formulation incorporated 100 g of Ambon banana purée as a natural carbohydrate and mineral source. The banana matrix provides essential micronutrients—particularly potassium, magnesium, and vitamin C—which not only enhance the nutritional value but also improve the texture and palatability of yogurt.

To increase the micronutrient content and health-promoting properties, the yogurt was enriched with ethanol extracts of Moringa oleifera leaves and Clitoria ternatea (butterfly pea) flowers in three different volumes (6, 8, and 10 mL). Moringa is known for its exceptionally high concentrations of calcium, potassium, magnesium, and zinc, while C.

ternatea provides anthocyanins, flavonoids, and phenolic acids with antioxidant, anti-inflammatory, and antidiabetic properties [8,9,14]. The addition of these extracts aimed to enhance the yogurt's functionality as a mineral-rich, plant-fortified fermented product.

3.2 Nutrients in Ambon Banana Yogurt and Moringa Leaf Extract

Results of research on Ambon banana yogurt with addition extract leaf Moringa analyzed content substance nutrition. Observation parameters micronutrients covering substance nutrition are potassium (K), calcium (C), magnesium (Mg), zinc (Z),

Table 1. Analysis of potassium content

No	Treatment (addition of moringa leaf extract)	$\bar{x}$	p*
1	A (6 ml)	0.41 [a]	0.062
2	B (8 ml)	0.46 [b]	
3	C (10 ml)	0.50 [c]	

* *One-way ANOVA*

One-way test results *ANOVA* obtained p value = 0.062, which means no difference between potassium and addition extract leaf Moringa 6 ml, 8 ml, and 10 ml.

Table 2. Analysis of the calcium test

No	Treatment (addition of moringa leaf extract)	$\bar{x}$	p*
1	A (6 ml)	722.57 [a]	0.006
2	B (8 ml)	645.75 [b]	
3	C (10 ml)	660.8 [c]	

* *One-way ANOVA*

One-way test results *obtained p = 0.006, which means there is a* difference between potassium and addition extract leaf Moringa 6 ml, 8 ml, and 10 ml.

Table 3. LSD test of calcium parameters

Variables	Treatment	p *	
		8 ml	10 ml
Calcium	6 ml	0.003	0.006
	8 ml		0.186

*LSD

Based on the results of *the least significant difference* test on the variable calcium, it can be concluded that there is a significant difference with the amount of added leaf Moringa.

Table 4. Magnesium analysis test

No	Treatment (addition of moringa leaf extract)	$\bar{x}$	p*
1	A (6 ml)	71.7 [a]	0.045
2	B (8 ml)	79.4 [b]	
3	C (10 ml)	83.5 [c]	

* One-way ANOVA

One-way test results *obtained p = 0.045, which means there is a* difference between potassium and addition extract leaf Moringa 6 ml, 8 ml, and 10 ml.

Table 5. LSD test of magnesium parameters

Variables	Treatment (addition of moringa leaf extract)	p *	
		8 ml	10 ml
magnesium	6 ml	0.061	0.021
	8 ml		0.216

*LSD

Based on the results of *the least significant difference* test on the magnesium variable, it can be concluded that there is a significant difference with the amount of added leaf Moringa.

Table 6. Zinc content analysis

No	Treatment (addition of moringa leaf extract)	$\bar{x}$	p*
1	A (6 ml)	10.8 [a]	0.007
2	B (8 ml)	18.66 [b]	
3	C (10 ml)	21.38 [c]	

* One-way ANOVA

One-way test results *obtained p = 0.007, which means there is a* difference between potassium and addition extract leaf Moringa 6 ml, 8 ml, and 10 ml.

Table 7. LSD test of the zinc parameters

Variables	Treatment (addition of moringa leaf extract)	p *	
		8 ml	10 ml
Zinc	6 ml	0.008	0.003
	8 ml		0.116

*LSD

According to the results of *the least significant difference* test on the variable, it can be concluded that there is a significant difference with the amount of added leaf Moringa.

The results of research in the form of substance nutrition are shown in Table 7.

Table 8. Substances Ambon Banana Yogurt and Moringa Leaf Extract

Treatment	Nutrients			
	Potassium (%)	Calcium (ppm)	Magnesium (ppm)	Zinc (ppm)
6 ml	0.41	722.57	71.7	10.8
8 ml	0.46	645.75	79.4	18.66
10 ml	0.5	660.8	83.5	21.38

Table 8 presents the content substance nutrition in Ambon Banana Yogurt with Moringa Leaf Extract addition, measured at various addition volumes of extract, namely, 6-, 8-, and 10-ml. Data show existence variation potassium, calcium, magnesium, and zinc contents along with an increase in the extract volume of Moringa leaf.

The potassium content increased proportionally with the addition of Moringa extract, from 0.41% at 6 mL to 0.50% at 10 mL. This indicates that *Moringa oleifera* leaves serve as a potent natural source of potassium. Potassium plays a key physiological role in maintaining osmotic balance, supporting nerve transmission, and regulating blood pressure [10,11]. The positive correlation between extract volume and potassium concentration suggests that the bioavailable mineral fraction from Moringa remains stable during fermentation.

The calcium concentration reached its peak (722.57 ppm) at 6 mL extract but decreased slightly at higher concentrations. This non-linear trend may be attributed to the precipitation of calcium salts (e.g., calcium lactate) or the formation of insoluble complexes with phytochemicals such as oxalates or polyphenols from Moringa at higher extract volumes. These interactions can reduce free calcium ions, a phenomenon also reported in plant-fortified dairy systems [5]. Despite this slight reduction, the overall calcium levels remained high compared with standard plain yogurts (which typically contain ~400–500 ppm calcium), indicating the efficacy of Moringa as a mineral fortificant.

Both magnesium and zinc levels increased significantly with the addition of Moringa extract, reaching 83.5 ppm and 21.38 ppm, respectively, at 10 mL. This finding aligns with reports that Moringa leaves contain approximately 370 mg Mg and 31.03 mg Zn per 100 g dry weight [14]. The enhancement of these two minerals is nutritionally relevant, as magnesium supports muscle and heart relaxation, while zinc is essential for enzymatic activity, immune regulation, and protein synthesis [12]. The positive trends for potassium, magnesium, and zinc demonstrate that Moringa extract improves the mineral density of yogurt without disrupting fermentation or product stability. The results confirm that *M. oleifera* is an effective fortifying agent for enhancing the functional quality of dairy-based foods.

4. Nutrients in Ambon Banana Yogurt and Butterfly Pea Flower Extract

Potassium analysis

Table 9. Potassium content analysis by addition of butterfly pea flower extract

No	Treatment by addition of butterfly pea flower	x̄	p*
1	A (0 ml)	0.04 [a]	0.345
2	B (5 ml)	0.48 [b]	
3	C (10 ml)	0.37 [c]	

* One-way ANOVA

One-way test results *ANOVA* obtained p value = 0.345, which means No There is a difference between the addition of butterfly pea flower dye (0, 5, and 10 ml) and potassium.

Zinc analysis

Table 10. Zinc content analysis by addition of butterfly pea flower extract

No	Treatment by addition of butterfly pea flower	x̄	p*
1	A (0 ml)	18.32 [a]	0.008
2	B (5 ml)	2.19 [b]	
3	C (10 ml)	13.41 [c]	

* One-way ANOVA

One-way test results *showed a* p value = 0.345 which means There is the difference between the addition of butterfly pea flower dye (0, 5, and 10 ml).

Table 11. LSD test of the zinc parameters

Variables	Treatment	p *	
		5 ml	10 ml
zinc	0 ml	0.004	0.008
	5 ml		0.207

*LSD

According the results of *the least significant difference* test on the variables zinc, it can be concluded that there is a significant difference with the amount of butterfly pea flower dye added.

Analysis of the calcium test

Table 12. Analysis of the calcium test

No	Treatment by addition of butterfly pea flower	x̄	p*
1	A (0 ml)	180.6 [a]	0.121
2	B (5 ml)	50.86 [b]	
3	C (10 ml)	192.5 [c]	

* Kruskal Wallis

The results of the Kruskal–Walli's test were obtained p = 0.121, which means that there is no difference in zinc levels between groups with the addition of butterfly pea flower dye (0, 5, and 10 ml).

Magnesium analysis test

Tabe 13. Magnesium content analysis

No	Treatment by addition of butterfly pea flower	x̄	p*
1	A (0 ml)	77.9 [a]	0.121
2	B (5 ml)	55 [b]	
3	C (10 ml)	58.8 [c]	

*Kruskal Wallis

The results of the Kruskal–Wallis test were obtained p = 0.121, which means that there is no difference in zinc levels between the groups with the addition of butterfly pea flower dye (0, 5, and 10 ml). The results of the research on yogurt with the addition of butterfly pea flower extract analyzed the content substance nutrition. Observation parameters of substance nutrition are potassium (K), calcium (C), magnesium (Mg), and zinc (Z), among others. The results of research in the form of substance nutrition are shown in Table 13.

Table 14. Ambon Banana Yogurt and Butterfly Pea Flower Extract

Treatment	Nutrients			
	Potassium (%)	Calcium (ppm)	Magnesium (ppm)	Zinc (ppm)
6 ml	0.04	180.6	77.9	18.32
8 ml	0.48	250.86	55	12.19
10 ml	0.37	192.5	58.8	13.41

Table 14 presents the content data substance nutrition in ambon banana yogurt with butterfly pea flower extract in three different volumes, namely, 6, 8, and 10 ml. The data show variation in the potassium, calcium, magnesium, and zinc contents among others in the third treatment.

The potassium concentration exhibited a non-linear pattern: an increase from 0.04% (6 mL) to 0.48% (8 mL) followed by a decline to 0.37% (10 mL). The sharp rise at 8 mL indicates an optimal fortification level where bioavailable potassium remains stable. However, the subsequent decrease at higher concentrations may be due to the binding of potassium ions by anthocyanins or other polyphenols in the extract, reducing measurable free potassium. Similarly, calcium reached its highest value at 8 mL (250.86 ppm) and decreased at 10 mL (192.5 ppm). The non-linear relationship between extract volume and calcium retention may result from interactions between the extract's phenolic compounds and milk casein micelles, forming insoluble complexes that lower calcium solubility. These interactions are well documented in the enrichment of dairy matrices with phenolic-rich extracts [4,5].

Magnesium and zinc levels decreased slightly with increasing extract concentrations, showing their highest levels at 6 mL (77.9 ppm and 18.32 ppm, respectively). The decline at higher concentrations suggests that excessive anthocyanins and flavonoids could chelate metal ions, reducing their availability in the soluble fraction. Nonetheless, even at 10 mL addition, the micronutrient levels remained higher than in unfortified yogurt, confirming that butterfly pea extract contributes meaningfully to mineral enrichment.

Vitamin C, which is found in Ambon bananas, can also help increase iron absorption. Through the formation of the ferrous ascorbate complex, vitamin C increases the absorption of iron from food by reducing iron from ferrous to ferrous [15]. In addition, the acid ascorbate prevents the formation of iron compounds that are not dissolved and cannot be absorbed and reduces iron from ferrous to ferrous, which is necessary for the absorption of iron in the cell mucosa. The combination of iron salt and 200 mg of citric acid and ascorbate can increase iron absorption from 25% to 50%. Adding 25 mg and 50 mg of acidic ascorbate increases iron absorption from 1.6% to 5.1% and 7.7%, respectively. This shows that sour ascorbate significantly increases the absorption of nonheme iron. Ambon banana (*Musa paradisiaca* L. var. ambon) 100 g contains 466 mg of potassium, 11 mg of sodium, 7.65 mg of calcium, and 24 mg of magnesium. Bananas have lots of benefits because of their content substance and diverse nutrition, which is critical for human health. A mineral that helps guard balance fluids and electrolytes is potassium, which has characteristic natriuretic and diuretic properties, which increase expenditure from sodium and fluids.

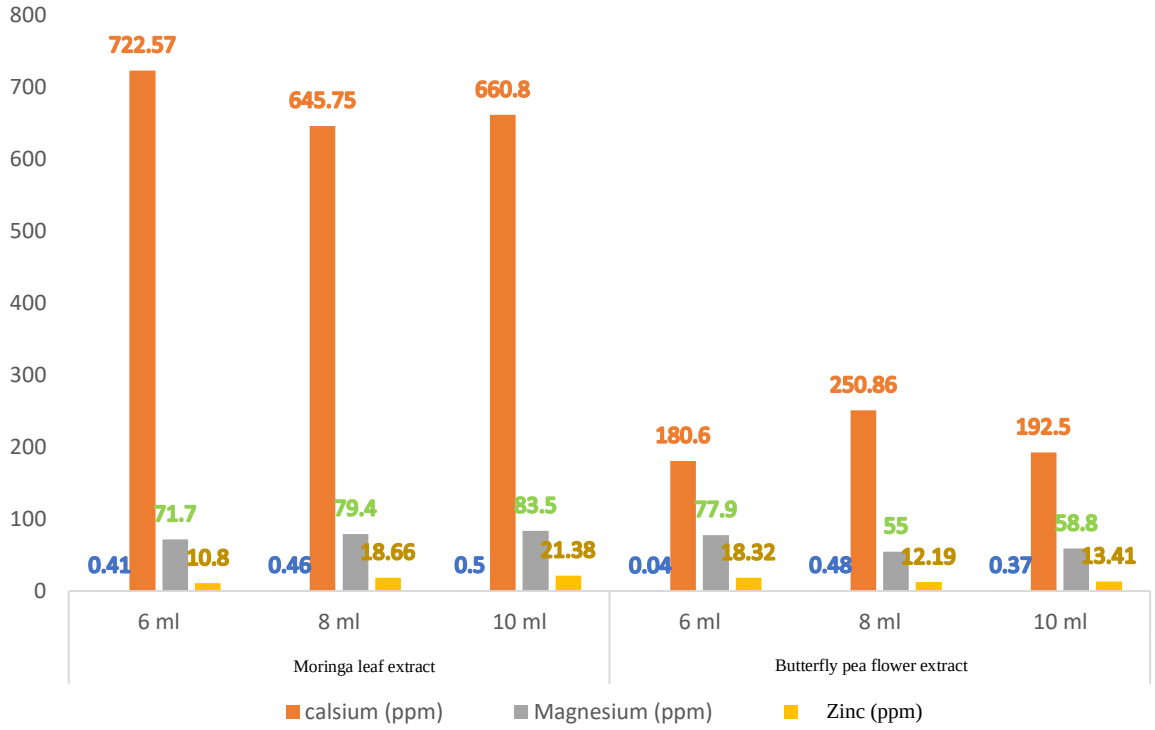

Figure 1. Micronutrient content of yoghurt from moringa leaf extract and butterfly pea flower extract

From the results in Fig. 1, the known content of yogurt micronutrients with extract leaf moringa and butterfly pea flowers shows that the addition of extract moringa leaf consistently increases the level of calcium, magnesium, and zinc. The highest calcium level was reached at 722.57 ppm when extract leaf Moringa was added to 6 ml, although the level A slightly decreased at 8 ml (645.75 ppm) and 10 ml (660.8 ppm). Magnesium levels significantly increased from 71.7 ppm at 6 ml to 83.5 ppm at 10 ml, indicating that the Moringa extract leaf contributes positively to the magnesium content in yogurt. Zinc levels also significantly increase.

On the other hand, yogurt containing butterfly pea flower extract showed level sufficient calcium high at 8 ml (250.86 ppm), but dropped to 10 ml (192.5 ppm). The highest magnesium level was also recorded at 6 ml (77.9 ppm), but tended to decrease at higher extract volumes. Likewise, the highest zinc content was recorded at 6 ml (18.32 ppm), but it tended to decrease at extract volumes of 8 and 10 ml. This indicates that even though the flowers When compared with butterfly pea flower extract, extract leaf of Moringa showed results that were more stable and significant in increasing the content of yogurt micronutrients, especially zinc and magnesium. Therefore, the addition of the extract leaf of Moringa, especially in a volume of 10 ml, can be recommended as an innovation for making fortified functional yoghurt micronutrients.

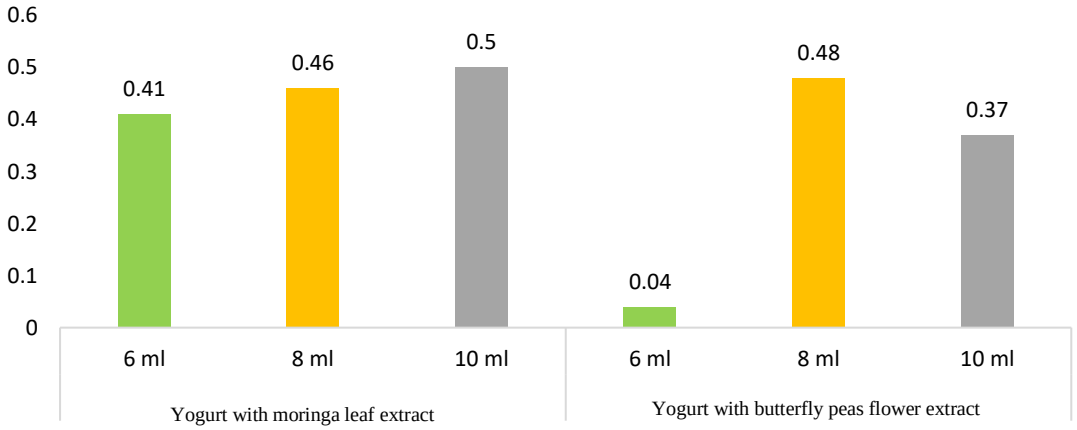

Figure 2. Potassium content (%) of moringa leaf extract yoghurt and butterfly pea flower extract

Figure 2 shows the potassium content (%) in yogurt with the addition of the leaf extract of Moringa and butterfly pea flower extracts, showing that the potassium content of yogurt with the leaf extract of Moringa tends to increase along with the increased extract volume. The highest potassium content recorded in the addition extract leaf Moringa was as much as 10 ml, namely 0.50%, followed by 8 ml of 0.46%, and 6 ml of 0.41%. This shows that extract leaf Moringa consistently contributes to the improvement of potassium content in yogurt, which makes it a good choice for enriching food products with essential minerals. Yogurt with the addition of butterfly pea flower extract showed less trend stability. The potassium content in the addition of 6 ml is very low , only by 0.04%, but increases sharply at 8 ml to 0.48%, then decreases to 0.37% at 10 ml. Fluctuating pattern This indicates that the effectiveness of butterfly pea flower in increasing the potassium content in yogurt is inconsistent and can be influenced by the volume of extract and the interaction with other components in yogurt. Overall, results This show that Moringa leaves are more effective and consistent in increasing potassium content in yogurt than butterfly pea flowers. Therefore, the use of extract leaf Moringa, especially in larger volumes, such as 10 ml, can be recommended for functional yogurt formulation with optimal potassium content, which is beneficial for health, especially in arrangement pressure blood and balance electrolyte body.

The moringa comes from India and is now planted in many countries in Asia, Europe, and Africa, one of which is Indonesia. For years, moringa has been known as a multipurpose plant containing lots of nutrition and have lots of benefit medicine. Plants Moringa play a role important in fulfilling the need for nutrition. Many nutrients are contained in Moringa. Because of its high nutritional value, part leaf plant Moringa is usually used as food. Leaves of moringa contain a high amount of vitamins, minerals, carbohydrates, and many micronutrients as well as macronutrients, which are essential other higher compared with part big fruits and vegetables. Moringa leaves contain minerals, such as zinc, calcium, iron, and potassium, as well as almost all vitamins, such as vitamins A, B, C, D, and E [14]. Moringa leaves contain 31.03 mg/kg zinc minerals. In addition, moringa owns a high calcium level. In the form of fresh leaves, the content is 4 times higher than that of milk (440 mg/100 g), and in the form of flour, the content is 17 times higher, i.e., 2,003 mg/100 g.

Research results showed that Ambon banana yogurt with additional of extract moringa leaves is beneficial for human health. Almost all treatments in the study had high nutrition, but the treatment with the addition of the extract of moringa leaves contained 10 mL of the maximum compared to the treatments that added 6 and 8 mL of the extract. The moringa leaves contained 20.03 g of calcium/100 g of dry weight and 13.24 g of potassium/100 g of dry weight. Calcium is the most abundant mineral in moringa leaves, followed by potassium. The role of potassium is crucial for the body, as it plays an important role in the function of nerves and contractions muscle through maintenance potential membrane cells, contraction muscles and transmission impulse nerves, and pancreatic insulin secretion. Potassium required for normal heart function nerves and contractility muscles, including contractility effective muscle heart. Potassium is used to arrange the heart, water balance, transmission nerves, sour base balance, catalyst, contraction muscle, control pancreatic insulin secretion, and maintain cell membrane permeability. The study findings showed that adding 6 mL of moringa leaves extract produces the

highest level of calcium. The smallest treatments, 8 and 10 mL, even increased the level of calcium. In this study, sample of moringa leaves used randomly both old and young moringa leaves. As a result, the content of calcium in the old moringa leaf was higher than that in the young moringa leaf. Calcium also tended to accumulate in a larger network of leaves old. Calcium levels in plants have a trend of older phase development, so the higher the level of calcium. Calcium concentration increases along with the development of plant organs. The concentration of calcium in various plant organs, including leaves, can vary depending on the supply of calcium, with indication that the organ is older. It is possible that the concentration of calcium in different organs is different compared with that in more young organs.

5. Conclusion

The supplementation of Ambon banana yoghurt with Moringa (*Moringa oleifera*) leaf and Butterfly pea (*Clitoria ternatea*) flower extracts significantly influenced its micronutrient composition. The highest potassium concentration was observed in yoghurt with 10 mL of Moringa extract (0.50%), followed closely by yoghurt containing 8 mL of Butterfly pea extract (0.48%). The optimal calcium levels were obtained with the addition of 6 mL of Moringa extract (722.57 ppm) and 8 mL of Butterfly pea extract (250.86 ppm). Similarly, the magnesium content peaked with 10 mL of both Moringa and Butterfly pea extracts (83.5 ppm and 58.8 ppm, respectively). The zinc content reached its highest levels in yoghurt enriched with 10 mL of Moringa extract (21.38 ppm) and 6 mL of Butterfly pea extract (18.32 ppm). These findings indicate that the fortification of Ambon banana yoghurt with Moringa and Butterfly pea extracts enhances its mineral content, thereby improving its potential as a functional food product with added nutritional and health benefits, particularly for populations at risk of micronutrient deficiencies.

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