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Synbiotic Soygurt Tempe Extract as A Functional Beverage

Agnes Sri Harti[1], Mellia Silvy Irdianty[2], Arwin Muhlishoh[3], Yusup Subagio Sutanto[4]
[1.2]Nursing Study Program, Kusuma Husada University, Surakarta, Indonesia
[3]Nutrition Study Program, Kusuma Husada University, Surakarta, Indonesia
[4]Pulmonary Disease Study Program, Faculty of Medicine, Sebelas Maret University, Surakarta, Indonesia

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Corresponding Author:

Agnes Sri Harti, Nursing Study Program, Kusuma Husada University, Surakarta, Indonesia
Email: agnessriharti168@gmail.com

ABSTRACT

Synbiotic tempeh extract soyghurt is a Krenova (creative and innovative) food product because it is novelty and unique as healthy and safe food, functional food, fun for diet and one for all. The result of probiotic fermentation of Lactic Acid Bacteria (LAB) and based on synbiotic tempeh extract (rice bran and chitosan) which has multifunctional anti-hyperglycemia and anti-hypercholesterolemia properties. Research objective: to analyze the effectiveness of synbiotic tempeh soyghurt as a functional drink. The research method analyzes the nutritional content and quality of synbiotic tempeh soygurt products which refer to SNI 7552:2009 concerning flavored fermented milk. Data analysis used bivariate and multivariate Anova tests. The Hedonic test results showed a semi-solid texture, white color, synbiotic tempeh extract aroma, sour taste in the formulation with the addition of 15% skim milk, 1% chitosan, 1:1 ratio LAB starter mix and 5% inoculum. The results of physical chemical and mycobiological quality tests show that the synbiotic tempeh extract meets the quality test as a functional drink.

Keywords: *soygurt, synbiotic tempeh, crenova*

1. INTRODUCTION

Functional beverages are a type of beverage that not only offers hydration, but also contains active ingredients that provide additional health benefits. Unlike regular beverages, functional beverages are enriched with certain substances such as vitamins, minerals, probiotics, fiber, or other bioactive substances designed to support certain body functions, improve health, or prevent disease. [21]

The concept of functional beverages comes from the changing modern lifestyle that is increasingly aware of the importance of health and disease prevention through diet. Along with the increasing consumer demand for products that can provide health benefits that are more than just basic nutrition, the food and beverage industry continues to develop functional product innovations. These products are marketed as solutions to various health problems such as increasing endurance, improving the digestive system, supporting heart health, or even increasing energy and focus. [2]

Examples of popular functional beverages include probiotic drinks such as yogurt that are rich in good bacteria for digestive health, energy drinks enriched with caffeine and vitamin B complex to increase stamina, and detox drinks that contain antioxidants to fight free radicals. [14] In addition, there are also legume-based drinks, such as soygurt (soy-based yogurt), which is rich in isoflavones and is known to have health benefits such as reducing the risk of heart disease and supporting bone health.

In Indonesia, functional beverage products such as tempeh and fermented soy-based beverages are also gaining attention as healthy alternatives that are rich in nutrients. Soybeans as the basic ingredient are often used in the fermentation process to produce beverages containing probiotics and other bioactive substances, such as isoflavones which are known to have positive effects on heart health and hormonal balance. [9]

Overall, functional beverages provide consumers with more varied choices to maintain their health through easy and practical consumption. These beverages offer added value by providing specific health benefits in addition to the basic benefits of hydration. However, it is important for consumers to understand that functional beverages are just one part of a broader healthy lifestyle, and are not a substitute for a balanced diet or medical consultation. [17]

Protein and micronutrients are important nutrients that can affect bone formation (calcium), bone length development (zinc) and increased intrauterine femur length (supplements) so that an innovation in functional food is needed that is liked by children but has a high protein nutritional content. [29] The concept of synbiotics (prebiotics and probiotics) as functional food biosupplementsbecome an alternative to be developed in fermented soy milk or soyghurt foods so that it can be used to prevent stunting. [18] & [3] Liquid soy milk contains 3.5 grams of protein, while cow's milk only contains 3.2 grams per 100 grams. The quality of soy milk protein in the form of a single food is 80% of the quality of cow's milk protein. [20]. Soyghurt as one way of fortifying fermented yoghurt foods based on vegetable protein is made from soybeans. [26]. Based on the results of a survey via a web application, the soyghurt that is known and available on the market is generally based on soybean seed extract alone without the addition of synbiotics and fermented with probiotics or BAL.among others*Lactobacillus acidophilus, L. bulgaricus, Streptococcusthermophilus. [8]*

Chitosan bran synbiotic tempeh is an innovative product that combines tempeh, rice bran, and chitosan to create a functional food that is beneficial for health. Tempeh, which is a fermented food made from soybeans, is widely known as a good source of vegetable protein and probiotics. The fermentation process in tempeh allows probiotic bacteria to grow, which then helps improve digestive tract health and increase nutrient absorption. [16]. Meanwhile, rice bran or rice bran is the outer layer of rice grains that is rich in fiber, vitamins, minerals, and antioxidants. Rice bran is often considered a by-product in the rice milling industry, but its potential as a source of fiber and bioactive components has attracted the attention of researchers and food manufacturers. [28].

The combination of tempeh with rice bran creates synbiotics, which are foods that contain prebiotics and probiotics. Prebiotics, such as those found in rice bran, are food components that cannot be digested by humans but can be food for probiotic bacteria, thereby strengthening the growth of good microflora in the intestines. [32]. Thus, this synbiotic combination has the potential to improve the balance of gut microbiota which is important for the health of the digestive system and the body's immune system.

Chitosan, which is added in this synbiotic tempeh product, comes from chitin found in shrimp, crab, or insect shells. Chitosan has antibacterial and antimicrobial properties, so it can function as a natural preservative. In addition, chitosan is also known to lower cholesterol levels and has the potential as a weight control ingredient because of its ability to bind fat and reduce lipid absorption in the intestine. [24].

The synergy between tempeh as a probiotic, rice bran as a prebiotic, and chitosan as a natural preservative and additional health agent creates a food product that not only offers better nutritional benefits but also various other potential health benefits, such as cholesterol management, reduced risk of cardiovascular disease, and improved overall body metabolism. This synbiotic tempeh with rice bran and chitosan is suitable for consumption as a functional food in daily diet, especially for those who care about digestive and metabolic health. [25].

Chitosan bran synbiotic tempeh is a Krenova product that has obtained a Patent Certificate from the Indonesian Ministry of Law and Human Rights No. IDP000050238 which is beneficial from health, technology, economic and social aspects so that it can be used as a raw material for making synbiotic tempeh soyghurt. [11]. The use of synbiotic tempeh extract can be used as a raw material

for soygurt as one of the diversifications of processed tempeh products related to overcoming milk production in Indonesia which is still very low. [12]

Soyghurt synbiotic tempeh extract is a krenova (creative and innovative) food product because it has novelty and is unique using synbiotic tempeh extract as the raw material. Soyghurt synbiotic tempeh extract is a probiotic drink thatng is made from basic tempeh extract through a fermentation process, which combines the benefits of probiotics and prebiotics. In making this soygurt, tempeh is used as the main source because of its high protein content and is rich in isoflavones, which are bioactive compounds with health benefits, including antioxidant activity and prevention of chronic diseases. Tempeh also contains fiber that can support the growth of good bacteria in the digestive tract, thus strengthening the synbiotic properties of this product. [34]

The process of making synbiotic tempeh soygurt involves fermentation with lactic acid bacteria such as Lactobacillus plantarum. These bacteria have the ability to produce the enzyme β-glucosidase, which can hydrolyze isoflavones into more biologically active forms. During fermentation, these bacteria also help lower the pH, which creates an environment that supports the survival of probiotic bacteria. [35]. In addition, fermentation produces lactic acid components that play a role in improving the structure of intestinal microbes, which ultimately improves digestive health.

The advantage of synbiotic tempeh soygurt compared to regular yogurt is the additional prebiotic content from tempeh fiber and isoflavone compounds formed during fermentation. The combination of probiotics and prebiotics in this soygurt creates a synbiotic product that can support the balance of intestinal microflora. [6]. Probiotics help increase the population of good bacteria, while prebiotics are a source of nutrition for these bacteria. [7]

The health benefits resulting from the consumption of synbiotic tempeh soygurt are very diverse, including improving digestive tract health, strengthening the immune system, and preventing various metabolic diseases such as diabetes and heart disease. This product also has the potential to be developed as an alternative milk for individuals who are lactose intolerant, because the basic ingredient of tempeh is soy-based. [10]

Overall, synbiotic tempeh soygurt is a functional food innovation that combines the benefits of probiotics from fermented bacteria and prebiotics from tempeh fiber. This makes it an attractive option to support digestive health and overall well-being, especially in the context of modern lifestyles that increasingly focus on healthy and environmentally friendly eating.

The conceptual of this research isdevelopment of a patent prototype for synbiotic tempeh into synbiotic tempeh extract soygurt as a Krenova product through the BAL probiotic fermentation processbased onSynbiotic tempeh extract raw materials (bran and chitosan)so that it can function as a functional drink. Based on this, vocational product research is needed, namely design ordevelopment of a prototype of synbiotic tempeh soygurt as a Krenova food product because it has novelty and is unique using standardized and certified science and technology-based synbiotic tempeh extract raw materials, halal and economicalso it can function asfunctional drinks.The aim of this research was to analyze the potential of synbiotic tempeh extract soyghurt as a functional drink.

RESEARCH METHODS

EnglishThe main ingredients in this study were soybeans, rice bran and chitosan. Soybeans were obtained from the tempeh industry/SME manufacturing site in the Krajan Surakarta area. Rice bran was obtained from Pasar Legi Surakarta. Food grade chitosan was obtained from PT. Biotechsurindo Cirebon. The yoghurt starter used was from yoghurt or fermented milk products on the market, namely inoculum A (Streptococcus thermophilus, Lactobacillus bulgaricus, Lactobacillus acidophilus, and Bifidobacterium sp); inoculum B (Lactobacillus casei Shirota strain).

The study was conducted at the Nutrition Laboratory, Kusuma Husada University Surakarta and the Microbiology and Clinical Chemistry Laboratory, Setia Budi University Surakarta. The study was conducted in March - August 2023. Ethical eligibility letter from the Health Research Ethics

Commission of Dr. Moewardi Hospital Surakarta Number 1.224 / VII / HREC / 2023 dated July 6, 2023.

The research stages include the manufacture of synbiotic tempeh soyghurt and analysis of physicochemical and microbiological tests.

1. Making Synbiotic Tempeh Extract Soygurt

Synbiotic Tempeh Fermentation

The process of making a themeSynbiotic soybean tempeh is carried out at UMKM locations based on the research results of Harti et al., namely soybeans are washed and then boiled for 30 minutes, then soaked for 24 hours and the skin is peeled. The soybeans are boiled again for 30 minutes, then drained and air-dried before being inoculated. [11]. To make synbiotic tempeh, it is made by mixing soybeans with bran that has been steamed for 15 minutes with a ratio of 10: 1 and then inoculated with 2% (w/w) tempeh yeast. Furthermore, the bran soybeans are wrapped in a perforated plastic bag and fermented for 48 hours.

Makern Yogurt Starter / Inoculum

Startr yoghurt from the results of isolation from commercial yoghurt (inoculum A and B) was inoculated aseptically as much as 25 ml into 50 ml of tempeh milk and then fermented for 8 hours at a temperature of 40oC. The parent starter was inoculated 5% in the tempeh extract to be made into yoghurt. [19]

Synbiotic Soyghurt Tempe Fermentation

ThemePE that has been formed compactly250 grams of tempeh is cut into 1 cm2 cubes and then boiled for 5 minutes. The purpose of boiling is to kill Rhizopus sp. in tempeh. Tempeh is blended and warm water is added with a ratio of 1:3 to make tempeh porridge. Tempeh porridge is filtered using a filter cloth. The result of filtering tempeh porridge is tempeh milk. Tempeh milk is added with skim milk as much as 5-15% (b / v) then pasteurized for 15-30 minutes at a temperature of 70-80oC. Tempeh milk is left to stand until it reaches a temperature of 40oC which is the optimal temperature for the growth of probiotic bacteria. The milk is then inoculated aseptically with 5% starter and incubated at a temperature of 400C for 12 hours.

2. Nutritional Content Analysis and Quality Test of Synbiotic Tempe Extract Soygurt Products

Objective: to analyze ppotential and nutritional contentsynbiotic soyghurt tempeh in terms of physical, chemical and microbiological properties. Analysis of nutritional content and quality testing of synbiotic soyghurt tempeh refers to SNI 7552:2009 on flavored fermented milk. Types of analysis include:

a. Peorganoleptic properties testing(color, odor, consistency, taste)toUse the Hedonic method to determine the level of consumer preference
b. Chemical analysis includes fat, non-fat milk solids, protein, ash, titrated acidity, metal contamination (Pb, Hg, As)
c. Microbiological analysis includes coliform
d. Microbiological analysis of synbiotic tempeh soygurt includes coliform and identification of Salmonella sp. Coliform analysis uses the MPN (Most Probable Number) method while identification of Salmonella sp is carried out on selective Bismuth Sulfite Agar media.

RESULTS AND DISCUSSION

Organoleptic test using the Hedonic method (preference) with parameters tested including acidity, taste, and aroma carried out by 30 panelists. Testing the level of panelist preference for synbiotic tempeh soygurt using a scale of 1 - 6, namely between values very dislike to very like.

Table 1. Organoleptic Test Results of Synbiotic Tempe Extract Soyghurt

Code	pH	Viscosity (cps)	Organoleptic		
			Flavor	Texture	Aroma
Synbiotic Tempeh Soygurt					
AA1	3.98	500	3.83	5.00	4.17
AA2	3.80	300	4.00	5.00	4.83
BB1	3.86	600	5.00	4.83	4.83
BB2	3.76	400	4.50	4.67	4.17
CC1	3.89	400	4.67	4.33	4.67
CC2	3.78	300	3.83	3.33	3.83
Non-Synbiotic Tempe Soygurt					
KA1	4	900	4.83	5.67	4.83
KA2	3.93	800	4.83	5.50	5.00
KB1	3.96	500	4.17	4.83	4.17
KB2	3.75	500	4.33	4.83	4.33
KC1	3.87	300	4.17	4.17	4.33
KC2	3.7	300	4.00	3.67	4.00

Information:

Chitosan 1%. Skim milk 15%.

5% inoculum (1 = inoculum A; 2 = inoculum A and B = 1 : 1).

AA2 = synbiotic tempeh extract + water = 1:1; BB2 = synbiotic tempeh extract + water = 1:2; CC2 = synbiotic tempeh extract + water = 1:3; KB2 = non-synbiotic tempeh extract + water = 1:2

The organoleptic properties of synbiotic tempeh extract soygurt products are semi-solid consistency, white color, distinctive aroma of tempeh extract and sour taste so that it can be categorized as a flavored fermented milk drink product. The organoleptic test value categories include 1 (very dislike) to 6 (very like). Based on table 1, the results of the organoleptic test of synbiotic tempeh extract soygurt with different types of inoculum show a taste value of 3.83 - 5.00; texture 4.33 - 5.00 and aroma 3.83 - 4.83 while non-synbiotic tempeh soygurt shows a taste value of 4.17 - 4.87; texture 3.67 - 5.67 and aroma 4.00 - 5.00. This shows that tempeh extract-based soygurt can be accepted as equivalent to cow's milk and soy milk-based soygurt products used as comparisons. Yogurt products based on full cream milk generally have a semi-solid consistency, a sweet and sour taste with the addition of sucrose and flavoring.The prebiotic tempeh extraction process is expected to bind the isoflavone compound factor-2 to glucose as isoflavone glycosides, namely genistin, daidzin and glycitin. [27]

Soy milk has almost the same nutritional content as cow's milk because it contains 3.5 - 4.0% protein, but does not contain casein so that soy milk can be used as a substitute for cow's milk fermented by BAL so it is known as soygurt. [4]. The formation of a semi-solid texture is due to the addition of 15% skim milk and the formation of Calcium lactate from the fermentation of lactose carbohydrates in skim milk. The type of carbohydrate in soy milk is different from cow's milk, especially glucose and lactose. [22].

The acidity level of soygurt is influenced by the accumulation of lactic acid from LAB fermentation in the substrate. The acidity level or pH of synbiotic tempeh extract soygurt shows 3.76

- 3.98 while the pH of non-synbiotic tempeh extract soygurt shows 3.70 - 3.96 so that it gives a sour taste. The more accumulation of lactic acid formed from LAB fermentation, the lower the pH which has an impact on the organoleptic of the product which is increasingly sour and has a semi-solid consistency. Semi-solid consistency occurs due to the reaction of the formation of Calcium lactate during the fermentation process by LAB. The various acids and aromas are the results of different fermentation processes. Respondents do not like acidity levels that are too high. Fermented milk that does not have too high acidity will be preferred by the public so that it can increase consumption of the milk. [15]

The taste of food is one of the important parameters that influences consumer acceptance of a food product. Taste is a very determining factor in a consumer's final decision to reject or accept a food, even though other assessment parameters are better, if the taste of the food is not liked then the product will be rejected. The resulting taste is influenced by the components in the ingredients and the process they undergo. So that in making flavored fermented milk drinks, additional ingredients can be added with fruit flavors such as strawberries, melon, grapes, orange, peach and colorings that match the flavors used to attract consumers and children.

SSoyghurt is a fermented soy milk product using Streptococcus thermophilus and Lactobacillus bulgaricus bacteria which are essential and active microbial species in symbiotic relationships and have been commonly used in the process of making yoghurt. Soygurt is yoghurt that uses soy extract as a substitute for cow's milk. Soygurt cultures can use BAL (Lactic Acid Bacteria) namely Lactobacillus plantarum, Bifidobacteria, Streptococcus thermophilus. [1]. The presence of prebiotic content in tempeh can be used as a substrate or raw material for making yoghurt. According to the International Dairy Federation, the minimum number of live probiotic bacteria to be able to play a role in health is 106 cfu/ml. [33].

BaLactobacillus bulgaricus, L. acidhopillus, and Bifidobacterium are lactic acid-forming bacteria that play a role in the production of yogurt. These three bacteria break down lactose into lactic acid in fermented milk. With the activity of lactic acid bacteria, the lactose in yogurt will decrease and the lactic acid levels will increase. The formation of lactic acid will affect the acidity value of yogurt. [5]. The breakdown of sugar in probiotic bacterial cells will produce energy for the activity of probiotic bacteria so that lactic acid is produced, causing a sour taste and coagulation. The level of lactic acid in yogurt is also influenced by the amount of sucrose added. [23].

Chemical analysis of synbiotic tempeh extract soygurt referring toSNI 7552:2009, hasconducted in the laboratory of the Surakarta Goods Quality Testing and Certification Center (BPSMB) as listed in table 2.

TABLE 2. Chemical Test Results of Synbiotic and Non-Synbiotic Tempe Extract Soygurt

Test parameters	Content % (w/w)				Quality Requirements SNI 2981:2009 SNI 01-2891-1992
	KB2	AA2	BB2	CC2	
Fat	0.044	0.045	0.037	0.035	Min 3.0
Milk solids	81.97	82.31	84.41	84.28	-
Milk solids not fat	79.43	79.58	82.09	81.31	Min 8.2
Protein	6.69	6.38	6.55	6.23	Min 2.7
Ash content	0.55	0.76	0.64	0.69	Max 1.0
Acidity	1.34	1.35	1.24	1.16	0.5 – 2.0
Sugar content	2.50	2.69	2.29	2.94	-
Metal contamination (mg/kg)					
- Lead (Pb)	0.25	0.12	0.12	0.12	Max 0.3
- Mercury (Hg)	< 9.6 x 10-5	< 9.6 x 10-5	< 9.6 x 10-5	< 9.6 x 10-5	Max 0.03
- Arsenic (As)	0.96	1.04	1.04	1.04	Max 0.1

Information: Chitosan 1%. Skim milk 15%. Inoculum 5%

AA2 = synbiotic tempeh extract + water = 1:1; BB2 = synbiotic tempeh extract + water = 1:2; CC2 = synbiotic tempeh extract + water = 1:3; KB2 = non-synbiotic tempeh extract + water = 1:2

Based on table 2, synbiotic and non-synbiotic tempeh extract soygurt showed fat content % (b/b): 0.035 - 0.045; milk solids % (b/b): 81.97 - 84.41; non-fat milk solids % (b/b): 79.43 - 82.09; protein % (b/b): 6.23 - 6.69; ash content fat content % (b/b): 0.55 - 0.76; acidity % (b/b): 1.16 - 1.35; sugar content % (b/b): 2.29 - 2.94 and lead, arsenic and mercury metal contamination met the minimum limit requirements according to the established standard.

The main components of fatty acids from soy triglycerides are unsaturated fatty acids dominated by linoleic acid, linolenic acid and a little oleic acid. These fatty acids are free from cholesterol and contain tocopherol, sterols, and phospholipids such as lecithin, and lipositol. Fatty acids contained in cow's milk fat are around 60-75% saturated fatty acids, 23-30% unsaturated fatty acids and 4% polyunsaturated fatty acids. Saturated fats have longer chains than unsaturated fats, this causes the degradation of saturated fats to be more difficult and longer than unsaturated fats. The results showed that the fat content of yoghurt would decrease after 96 hours of fermentation because Lactobacillus was able to reduce fat content by being absorbed as an energy source for growth. The use of L. casei and L. acidophilus inoculum with a concentration of 2% in yoghurt fermentation can increase viscosity caused by denaturation of proteins by the lactic acid produced. Changes in viscosity are directly related to changes in the acidity of the resulting product. [31]

The acidity level is measured as a lactic acid product related to the pH of the product. The final product of fermentation can affect the growth of LAB because each microbe has an optimum pH activity for growth. This is known as feed back inhibition growth. Lactic acid from fermentation is correlated with the viability or number of bacterial cells. High bacterial viability will produce high lactic acid from the breakdown of glucose, lactose, sucrose, raffinose and stachyose as substrates or fermentation media through the glycolysis process.Lactobacillus bulgaricus and Streptococcus thermophilus bacteria are lactic acid-forming bacteria that play a role in the production of yoghurt. With the activity of lactic acid bacteria, the lactose in yoghurt will decrease and the lactic acid levels will increase. The increase in lactic acid levels in milk fermentation is always balanced with the decrease in the pH of yoghurt, meaning that the greater the level of lactic acid formed during fermentation, the lower the pH of yoghurt, but the decrease in lactose levels is not always balanced with the increase in lactic acid levels [31]. The protein content in a product is influenced by the viability and acceleration of cell growth. This is related to the enzymatic activity produced for microbial cell metabolism, namely proteolytic enzymes. [36]

Microbiological analysis of synbiotic tempeh soygurt refers to SNI 7552:2009 on flavored fermented milk, including coliform and identification of Salmonella sp. as listed in table 3.

Table 3. Microbiological Test Results of Synbiotic Tempe Soygurt

Product code	Test Type Microbial contamination	Test Results	Quality Requirements
AA 2	• Coliform Bacteria (APM/ml) • *Salmonella sp*/ 25 ml	• < 3 cells / 100 ml sample • Negative	• Max 10 • Negative
BB 2	• Coliform Bacteria (APM/ml) • *Salmonella sp*/ 25 ml	• < 3 cells / 100 ml sample • Negative	• Max 10 • Negative
CC 2	• Coliform Bacteria (APM/ml) • *Salmonella sp*/ 25 ml	• < 3 cells / 100 ml sample • Negative	• Max 10 • Negative
KB 2	• Coliform Bacteria (APM/ml) • *Salmonella sp*/ 25 ml	• < 3 cells / 100 ml sample • Negative	• Max 10 • Negative

Based on table 3, the results of microbiological testing of synbiotic soygurt tempeh indicate that the product meets the requirements of microbiological quality testing, namely MPN coliform <3 cells

per 100 ml and no Salmonella sp bacteria per 25 ml. This shows that the synbiotic soygurt tempeh product is a safety and healthy product. Coliform bacteria are normal flora bacteria in the human digestive tract and Salmonella sp especially Salmonella typhi are pathogenic bacteria that cause typhoid fever infections. Testing of food products in terms of microbiology needs to be carried out to describe the quality of raw materials, manufacturing processes and product packaging as an indicator of healthy, hygienic and safe food products when consumed by consumers.

CONCLUSION

The results of the analysis of the nutritional content and quality of synbiotic soygurt tempeh products based on SNI 7552:2009 meet the requirements as flavored fermented milk that can function as a functional drink and has the prospect of being developed as a standardized and certified Krenova product and achieving the target of being downstreamed and commercialized.Synbiotic tempeh extract soygurt has great potential as a healthy and safe fermented beverage product for consumption. Organoleptic tests using the hedonic method showed a good level of acceptance by panelists with adequate scores on taste, texture, and aroma parameters. Synbiotic tempeh soygurt products have a semi-solid consistency, a distinctive tempeh aroma, and a balanced sour taste, which makes them competitive with other fermented milk products such as cow's milk and soy-based yogurt. The fermentation process using lactic acid bacteria (Lactobacillus and Streptococcus) produces a stable texture and the desired acidity. The results of chemical tests showed that synbiotic tempeh extract soygurt contains fat, protein, and acidity levels that comply with SNI standards, and is free from heavy metal contamination such as lead, arsenic, and mercury. The prebiotic content in tempeh also functions as a substrate for probiotic bacteria, thus providing additional benefits for digestive health. In terms of microbiology, this product meets food safety standards with no contamination by pathogenic bacteria such as Salmonella sp. and a very low number of coliform bacteria. This product is declared safe, hygienic, and healthy for public consumption. Overall, synbiotic tempeh extract soygurt offers an attractive and healthy alternative for consumers looking for fermented soy-based products with the added benefits of synbiotics, which support digestive health and the immune system.

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