

Processed Food Creations Made From Tempeh

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Abstract — This research is a research that takes processed food products made from tempeh which are introduced in the community as the object of research. This study uses a quantitative method with purposive sampling using a questionnaire containing a hedonic test and a hedonic quality test through the Friedman test. Respondents from this study were 56 consumer panelists which is public society. The results of this study are based on the fried test, it can be seen the level of panelists' preference for processed tempe products based on aspects that have been determined by the researcher. From the aspect of aroma, processed tempe products in the form of hot pudding are preferred. From the aspect of taste, processed tempe products in the form of tempeh pancakes are preferred by the panelists. From the aspect of texture, processed tempe products in the form of croffles are preferred by the panelists. And from the aspect of appearance, processed tempe products in the form of tempeh

pancakes are preferred by the panelists. In general, tempeh creativity products are accepted both in terms of taste, aroma, texture, and appearance. However, the average results given by the panelists are based on the fried test or rating test for a product where the aroma, taste, texture and testing are different in each aspect, where the results of the assessment given by the panelists are influenced by the panelists' thoughts about aroma, taste, texture and appearance by the food of croffles, pizza, burgers, hot puddings, and pancakes that were created before this tempeh processed product existed. So that the taste, aroma, texture and appearance displayed by this tempe processed product were strange for some panelists.

Keywords : Tempeh, Creation, Processed, Organoleptic test

I. INTRODUCTION

Indonesia is an agricultural country, the number of soybean production in Indonesia itself experienced a drastic increase in 2018 which reached 650,000 tons of dry soybeans, in 2019 it decreased to 425,000 tons in 2020 again rose to 632.3 thousand tons, the increase was due to Indonesia adding Soybean production area, in 2021 the amount of production will decrease slightly from the previous year, which was 613.3 thousand tons. In 2021 to 2024, it is estimated that soybean production in Indonesia will again experience a gradual decline of 3.12% to 558.3 thousand tons due to unstable imports and exports. The instability of Indonesian soybean production in 2020-2024 is estimated to be due to intense competition in land use with other commodities, such as chili and corn. This then resulted in a 5% decline in harvested area per year, higher than the projected soybean product which only increased 2% per year (Ministry of Agriculture, 2021).

One of the typical Indonesian foods that require soybeans as the main raw material is tempeh. Tempe is a traditional food from Indonesia which is made from fermentation by the fungus *Rhizopus* sp in soy and non-soybean raw materials. This fungus will later form hyphae. Hyphae are fine white threads that will accumulate on the surface of soybean seeds which will later coalesce to form a white mycelium. The presence of fungi in tempeh can produce several enzymes, such as protease enzymes which are able to break down proteins into shorter peptides and free amino acids, besides that lipase enzymes are also produced which will break down fats into fatty acids, and also produce amylase enzymes which can break down complex carbohydrates into simple carbohydrates (Meilina, 2012).

The stages of making tempe include soaking, grinding, washing, boiling, cooling, adding yeast, packaging and fermentation. At each - each stage has a different goal. Each stage will trigger the fermentation process that occurs in soybean tempe. There are three main factors in the process of making tempe, namely the basic ingredients used, the microorganisms generated, and environmental factors that affect the growth of tempe, such as pH, humidity, and temperature. (Nur, A, 2012). Tempe can be processed into various kinds of processed products that are believed to be able to compete with existing products. Some unique foods that have been introduced in modern restaurants and restaurants such as croffles, pizzas, burgers, hot puddings, and tempeh pancakes (Krissianto, 2019). Tempeh-based food creations such as croffles, pizza, burgers, hot puddings, tempeh pancakes is a new processed creation using traditional ingredients and aims to add value to traditional

food into modern food that is often in demand by the public, especially young people. The food is then created with the main ingredient of tempe, the content of tempe in the food is expected to be able to be processed into a new product but still maintain the authenticity of the product. The materials used also use materials of good quality so that the resulting product does not fail and is well received by the community.

Researchers have conducted a preliminary survey by distributing questionnaires in the form of a preliminary survey of products to 30 respondents who were divided into 2 age ranges, namely teenagers > 18 years old to adults < 20 years. Preliminary survey questions with answer choices using a scale of 1 to 10. Preliminary survey questions are: 1) Intensity of tempe consumption, 2) Order intensity of tempe-based food, 3) Interest in tempe-based food, 4) Purchase decisions, and 5) Percentage of possible purchases.

Table 1. Preliminary Survey Result

Question	Response															Mean
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
How often do you eat tempeh?	7	7	7	9	7	8	9	7	8	8	7	9	8	7	7	7,7
How often do you order tempeh if you go to a restaurant?	7	8	7	7	8	7	9	7	7	7	9	8	8	8	9	7,8
Are you interested with tempeh croffles, tempeh pizza, tempeh burgers, tempeh hot pudding and tempeh pancakes?	7	7	7	8	8	8	8	7	7	7	7	8	9	6	7	7,5
If there is a restaurant, they provide tempeh croffles, tempeh pizza, tempeh burgers, tempeh hot pudding and tempeh pancakes. Are you likely to order the food?	7	7	8	7	8	7	8	8	8	8	8	7	8	6	7	7,6
What is the probability that you will try this restaurant again?	8	8	8	10	8	8	10	8	8	7	8	8	8	6	8	8,087

Source : Research Questionnaire Data (2022)

Table 2 Preliminary Survey Result (Continuation)

Question	Response															Mean
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
How often do you eat tempeh?	8	7	9	7	7	7	7	7	8	7	10	9	7	9	7	7,7
How often do you order tempeh if you go to a restaurant?	7	7	10	7	7	8	8	8	8	7	10	9	9	7	8	7,8
Are you interested with tempeh croffles, tempeh pizza, tempeh burgers, tempeh hot pudding and tempeh pancakes?	7	7	10	8	7	8	8	8	8	6	8	9	7	7	8	7,5

If there is a restaurant, they provide tempeh croffles, tempeh pizza, tempeh burgers, tempeh hot pudding and tempeh pancakes. Are you likely to order the food?	7	7	9	9	7	8	8	6	7	7	8	8	9	8	8	7,6
What is the probability that you will try this restaurant again?	8	6	9	8	6	8	7	6	8	6	8	8	9	10	7	7,8

Source : Research Questionnaire Data (2022)

The author makes an average of the results of the respondents, after a preliminary survey, the results obtained are that there is a mean of 7.7 from the results of the intensity of tempeh consumption, the mean is 7.8 from the results of the intensity of orders for tempe-based food, the mean is 7.5 from the results of interest in tempe-based foods, the mean is 7.6 from the results of purchasing decisions and the mean is 7.8 from the results of the percentage of possible purchases. From the calculation above, the writer then takes measurements using the Net Promoter Score (NPS) method. It can be seen from the survey results that 30 respondents have a high interest in the consumption of tempe-based foods, namely the Net Promoter Score (NPS) of 78%.

Based on Table 1. above, it can be seen that the majority of people like to consume tempeh as a main or complementary food. According to the results of the pre-survey, people often consume tempeh and have a high interest in tempe-based preparations. The public responds that tempeh is a frequent food and has its own charm to be consumed continuously. New products or preparations made from tempeh make people curious to try and taste it. People are interested in trying new products made from tempeh which are created into modern foods that have been known before. The percentage of people who are likely to reorder tempe-based processed products reaches 100%, it means that the public's interest in tempe-processed products is quite high. Although it can be processed into various types of appetizing food, the processing of tempeh as a special dish is still not too much. Processed creations made from. Tempe was present in the community and became popular in the form of croffles, pizza, burgers, hot pudding and tempeh pancakes. According to (Krissianto 2019), the benefits of tempeh are very good for the body, including being rich in protein than meat, the amount of calcium that can be equivalent to cow's milk, the only vegetable that produces vitamin B12, tempeh is an antioxidant, healthy for babies and individuals who are undergoing treatment. diet program. (Sumarto, S, 2015) stated that currently tempe is starting to spread to other countries. Tempe has been popular in Europe through the Netherlands since 1946. In Europe there were 18 tempe companies listed in 1984, there were 53 companies in the United States and 8 companies in Japan. In several other countries, tempe is becoming known even though it is limited among China, India, Taiwan, Sri Lanka, Canada, Latin America, Africa and Australia.

Based on the explanation above, the researchers are interested in conducting product research on processed food creations made from tempeh which were introduced to the community. The quality of ingredients, taste and presentation are interesting objects that researchers want to know and describe in this study. Formulation of the problem in this study How is the level of preference and level of goodness of the panelists' assessment of processed products made from Tempe in terms of aroma, taste, texture and appearance?, Can Tempe-based products be created?. The aims of this research are as follows : 1) To popularize processed products from the basic ingredients of Tempe, 2) To determine the level of preference and the level of goodness of the Panelist's assessment of Tempe-based products in terms of aroma, taste, texture and appearance.

Research Benefits through the results of this research, it is hoped that the following benefits will be obtained: 1) As a reference for hotel students and other similar fields regarding the analysis of processed food creations made from tempeh in creating a new product that is in demand by the public, 2) As a material for further research on processed food creations made from tempe, starting from the selection of ingredients, product quality, taste and presentation, 3) This research can be used as additional information and knowledge about the creation of processed foods made from Tempe, 4) This research can be a source of reference and information in order to know and explore more about the creation of processed foods made from Tempe, 5) This research can provide information and knowledge to the public about the basic ingredients of tempe which can be created into useful food preparations, 6) This research can be a reference source for conducting the same follow-up research.

II. LITERATURE REVIEW

Definition of Tempe

Tempe is a fermented processed product originating from Indonesia and has been made from soybeans. The fermentation process in making tempeh can retain most of the nutrients contained in soybeans, increase protein digestibility, and increase levels of several types of B vitamins (Sumarto, S, 2015). Molds that grow on tempeh are able to produce several enzymes such as protease enzymes to break down proteins into shorter peptides and free amino acids, lipase enzymes to break down fats into fatty acids, and amylase enzymes to break down complex carbohydrates into simpler compounds. Therefore, tempeh is very good for consumption by various ages (from infants to the elderly).

Tempe is an alternative protein and also has other benefits such as antibiotics and antioxidants. Tempe is made from fermented soybean seeds and a mixture of several other ingredients. The materials used for the fermentation process are *Rhizopus oligosporus*, *Rhizopus oryzae*, *Rhizopus stolonifer*, and several other types of *Rhizopus* molds (Nur, A, 2012). According to Krissianto (2019), tempeh is generally white in color, due to the growth of mycelia molds that glue soybean seeds together to form a dense texture. Tempe has a distinctive aroma due to the degradation of the components of the soybean itself.

The average consumption of tempeh in Indonesia per person is around 8.50 kg per year. Tempe is one source of protein that is widely consumed by the community, especially in rural areas as daily food for side dishes. Tempe is widely consumed as a food source of vegetable protein which has a taste similar to meat, so it is often referred to as artificial meat or meat analogue. The popularity of tempeh is also increasing as the composition of vitamin B complex is known which is quite high. Tempe is very suitable to be consumed as a side dish to rice, as is commonly used by Indonesian people, the combination of tempeh with rice can meet the needs of carbohydrates and protein. (Raswanti, H, 2019).

This fermented preparation is commonly known as "tempe yeast". Molds that grow on soybeans hydrolyze complex compounds into simple compounds that are easily digested by humans. Tempe is rich in dietary fiber, calcium, B vitamins and iron. Various kinds of content in tempeh have medicinal value, such as antibiotics to cure infections and antioxidants to prevent degenerative diseases. In general, tempeh is white in color due to the growth of mycelial molds that glue soybean seeds together to form a dense texture. The degradation of soybean components in fermentation makes tempeh have a distinctive taste and aroma. (Sumarto, S, 2015).

Sumarto, S, 2015) stated, Tempe specifically has the following nutritional content: 1) Fatty acid In the fermentation process in tempe, there is a tendency to increase the degree of unsaturation of fat. Fatty acids in the process do not. polyunsaturated fatty acids (PUFA) then began to increase in number. In this process, palmitic acid and linoleic acid decreased slightly, while the increase occurred in oleic and linolenic acids (linolenic acid was not found in soybeans). Unsaturated fatty acids have a lowering effect on serum cholesterol content so that they can neutralize the negative effects of sterols in the body. 2) Tempe is a very potential source of B vitamins. The types of vitamins contained in tempeh include vitamin B1 (thiamine), B2 (riboflavin), pantothenic acid, nicotinic acid (niacin), vitamin B6 (pyridoxine), and B12 (cyanocobalamin). Vitamin B12 is generally found in animal products and not found in plant foods (vegetables, fruits, and seeds), but tempeh contains vitamin B12 so that tempeh is the only potential source of vitamins from plant foods. Two vitamins found in tempeh are water-soluble vitamins (B complex vitamins) and fat-soluble vitamins (vitamins A, B, E and K). Vitamin B12 levels in tempeh range from 1.5 to 6.3 micrograms/100 g of dry tempeh. This amount has been able to meet the needs of a person's vitamin B12 per day. 3) Tempe contains macro minerals in sufficient quantities. The amount of iron, copper and minerals is 9.39, respectively; 2.87; and 8.05 mg every 100 g of tempeh. Tempe mold can produce phytase enzymes which will decompose phytic acid (which increases some minerals) into phosphorus and inositol. As phytic acid breaks down, certain minerals (such as iron, calcium, magnesium, and zinc) become more available for the body to use. 4) The antioxidants in tempeh are in the form of isoflavones. Isoflavones are also antioxidants that are needed by the body to stop the formation of free radicals. In soybeans against three types of isoflavones, namely daidzen, glisic and genisten. In tempeh, besides the three types of isoflavones, there are also antioxidants factor II (6, 7, 4-trihydroxy isoflavones) which have the strongest antioxidant properties compared to isoflavones in soybeans.

Types of Tempe

The types of tempe are : 1) Soybean Tempe which is commonly known by the Indonesian people is tempeh from soybeans which is yellow in color, solid in shape and white in color. Soybean tempeh has a compact structure, dense and covered by white mycelium. 2) Koro Tempe comes from the area around the Kedung Ombo Reservoir, made from koro bentuk seeds. The structure and color are similar to soybean tempeh. Koro tempe actually contains a natural compound of cyanide acid, but the process of soaking and washing repeatedly makes this toxic content disappear. 3) Green Beans Tempe is also called "mungbean tempeh" made from green beans, in Indonesia it ranks fourth tempeh made from legumes. Famous in Central Java and Yogyakarta, this green bean tempeh has a distinctive texture. 4) Gembus Tempe is made from gude dregs (sliced beans) in the manufacture of starch. This tempeh is popular in Lombok and eastern Bali, this tempeh has a soft texture. 5) Red Beans Tempe Another term given is "Green bean tempeh" made from red beans (beans). Tempe is widely consumed in Indonesia, but worldwide. This tempe is also rich in fiber, calcium, B vitamins and iron.

The Processed of Product Creations made from Tempe

Processed creations made from tempeh are present in the community and become popular in the form of Tempe croffles, Tempe Pizzas, Tempe Burgers, Hot Puddings Tempe and Tempeh Pancakes. This product is packaged and introduced in a modern way but still maintains the authenticity of the product. This product is then widely liked by various groups of people in Indonesia. The innovation of processing tempe-based food creations into modern dish menus is a new idea to make traditional basic ingredients famous through modern markets such as the use of tempeh as the basic ingredient for processed food creations such as croffles, pizza, burgers, hot pudding and tempeh pancakes. The process of making tempe-based food is the same as making the original food, only it is distinguished by mixing the ingredients and the resulting taste. For example, in the manufacture of tempeh-based burgers. The tempeh-based burger was chosen because tempeh is a food ingredient that tastes almost similar to meat, tempeh is also referred to as artificial meat so that the taste and appearance is not less attractive than similar meat. The combination of tempeh and other ingredients makes it unique in its presentation and appearance, this is what is considered to be able to attract people's attention to try and consume it continuously.

a. *Tempe Croffle*

Croffle is a dessert or dessert that is currently popular among the public because it has a unique and delicious taste. Croffle is taken from the combination of the names croissant and waffle, where the manufacturing process uses croissant dough while the method of making it uses a waffle mold (Irvani, A., 2021). The ingredients in making croissant dough are usually flour, cold water, salt, butter, yeast, sugar and milk. In making tempeh croffles, there are similarities with croffle ingredients, only that tempeh has been cut into pieces and mashed in the dough mixture.

b. *Tempe Pizza*

Pizza is a bread that has a flat shape with a diameter of approximately 30 cm. The manufacturing process is baked using the oven, pizza is given tomato sauce and cheese and additional food as a topping. Toppings are usually used such as grated cheese or mozzarella cheese as well as meats and sauces such as salami, pepperoni, bacon and olives. Pizza can also be topped with vegetables, chilies, peppers, onions or mushrooms. The bread used is usually flavored with garlic, butter or herbs and sesame (Erwin & Lily, 2009). Various snacks can be used as toppings as a complement and sweetener, one of the foods that can also be used as a topping is tempeh.

c. *Tempe Burger*

Burger is a food in the form of a round bun containing vegetables such as tomatoes, celery, onions and sauce and meat. Burgers are also referred to as steaks made from minced meat and cooked in a round shape. This food comes from Germany and became known to the world community in the 19th century and still exists today (Adams, C. J, 2018). This dish is a dessert that is often favored by all people, apart from being a dessert, burgers are also known as hunger-delaying foods because they are made from filling bread and meat. Burgers with meat filling are then created with processed tempeh. Tempe is also referred to as artificial meat because the taste and texture are often similar to meat, so the use of tempeh as the basic ingredient in making burger meat is a unique and interesting innovation. This food is combined with raw or undercooked vegetables in it, modified by grilling or frying.

d. *Hot Pudding Tempe*

Hot Pudding is usually served as a dessert or dessert. Dessert is usually served at dinner, but along with the development of the culinary world, dessert has become an important part of breakfast, lunch and dinner.

According to Andjani Zella (2014) "Dessert is food served after the main course as dessert. Dessert has a sweet and fresh taste and has a slightly salty taste combination. Tempe hot pudding is one of the desserts that is starting to be in demand and served by various groups. Hot pudding is usually served after the main meal and served cold or half cold.

e. *Tempe Serabi*

Serabi or surabi is a traditional food that has been around since the 1900s, serabi or surabi comes from West Java (Rahmi Holinesti, 2020). Serabi is a round and flat, porous snack made from rice flour, coconut milk, brown sugar and yeast. Serabi is now starting to exist and is owned by the community, many people add toppings with various food ingredients (Erwin, L, 2013). There are various kinds of pancakes in Indonesia, such as solo pancakes, Jakarta pancakes, Bandung pancakes, etc. Each region has its own characteristics in the presentation and the materials used depending on the tastes and uniqueness of the food creations that are innovated. One of the new innovations in making pancakes is the use of tempeh as the basic ingredient, so it is called tempeh serabi.

Community Interest

Interest is an affective aspect that has a role in an individual's life (Ikbal, 2011). The affective aspect is an aspect that identifies the dimensions of feeling from emotional awareness, disposition and a will that affects one's actions, actions and thoughts. This dimension also includes three things, namely (1) feelings related to different objects; (2) feeling- which has a direction starting from a neutral point towards the opposite side; and (3) feelings that have different intensities.

Interest is a motivation that encourages someone to do or choose what they want (Susilowati, 2016). Every interest will satisfy a need in carrying out its function, the will is closely related to thoughts and feelings. The mind has a tendency to move in the rational analysis sector, while the subtle or sharp feelings add to the need and reason serves as a reminder of thoughts and feelings so that the desired desires can be managed as well as possible.

Interest depends on internal factors from within a person. Interests can be controlled by someone who has certain desires such as concentration of attention, curiosity, motivation and needs in life. So interest can be concluded as curiosity, wanting to own or want to choose something they do and are free to choose their needs in carrying out their will related to feelings and thoughts on what they want. According to Abdul Rahman Shaleh (2004), interest has several indicators, including: 1) Encouragement from within the individual / self to do work or seek an income. 2) Social motive the factor that will arouse someone's interest to do or choose is the urge to do something social activity. 3) Emotional factor which interest has a close relationship with emotions. Thus, it can be said that interest is a strong impetus for someone to do everything in realizing the achievement of the goals and ideals that he wants.

Previous Research Results

Previous research conducted by Hana Raswanti (2018) describes efforts to increase tempe consumption. In this study, tempeh is processed into food that has more appeal in the community. The tempeh-based food that is most in demand by the public is tempeh steak. Tempeh steak has a distinctive taste, appearance and aroma when served and has a soft texture. Another researcher, Ani Radiati (2015) explains the process of making tempeh products. The result of this research is that the process of making tempeh from non-soy beans is the same as tempeh made from soybeans.

Good process and packaging affect the resulting fermentation. Finally, research conducted by Pratiwi Anggareni (2017) explains that internal and external influences have a role in the product market. Quality products and have many variants, cooperation and good management can make products compete well in the market. Products that have unique characteristics and are different from others also have an effect on marketing in the community.

Research conducted by Juliana et al (2020) explains about making hydroponic vegetable salads so that they can process salads to be durable, develop and learn more about hydroponic vegetable businesses and how to market using e-commerce. Research conducted by Juliana et al (2020) explains about the creation of tamarind dodol snack products to add variety to dodol and develop the use of tamarind meat so that it can be consumed by various groups. The results of the organoleptic test on tamarind dodol have classic characteristics, similar to dodol in general which has one color, one taste, in one product. Research conducted by Juliana et al (2021) describes the use of vegetables in the manufacture of non-meat lasagna. The results of this study are the process

of using vegetables in the manufacture of non-meat lasagna which aims to enable people to become entrepreneurs in the future.

Research conducted by Juliana (2022) the main ingredient of boba is tapioca flour, which has no taste. The sweet taste of boba comes from the sugar or honey. Boba or bubble is a slang word in Mandarin. Boba is made from tapioca flour or cassava. In ancient times, Chinese immigrants who came to Taiwan set up teahouses to serve cold tea by putting tapioca balls into the drink. Boba has also spread to European countries. China offers instant boba milk tea, which we can store stock at home and brew when cold (Tinambunan, Syahra, & Hasibuan, 2020). Since 2018, boba has become one of the public's most sought-after and favored toppings. Boba is a topping frequently added to drinks to give a more delicious taste and a strong flavor. Boba is suitable as a topping as it has a distinctive and unique taste and is one of the popular toppings. Researchers chose to design an experiment on sensory quality boba because we wanted to innovate from existing products and there is a large market selling boba with many enthusiasts. Fröjdö, (2018) stated that bubble tea was invented in 1986 when tea house owner Tu Tsong-He was inspired by the white tapioca boba seen at Ya Mu Liao market. He made tea using white tapioca balls into a black version mixed with brown sugar (Pangkey, Lapian, & Tumewu, 2016). The word boba originally came from a shaken drink to form a bubble, which later became the idea to make a delicious consumption topping. Most boba is made using palm sugar to create a sweet taste suitable for today's trendy drinks.

III. METHOD

The scope of this research includes the processing of food creations with the basic ingredients of tempe. Test the acceptability of tempe processed food products to panelists consisting of croffles, pizza, burgers, hot pudding and pancakes. This test uses an organoleptic test, namely by doing a hedonic test. Through this organoleptic test, the researcher then conducted an analysis of the processed products made from food creations with the basic ingredients of tempeh and could then give an indication of spoilage, quality deterioration and other damage to the product (Dhingra & Jood, 2007).

This research is a quantitative research. This research on the manufacture of processed food creations from tempeh is included in the Research and Development (R&D) type of research. The research and development method is a research method with the aim of producing certain products and testing whether these products are effective or not. The research and development procedure in this study is based on the stages described by (Sugiyono, 2011), as for the stages to be carried out starting from problem identification, data collection, product design, design revision, product testing, product revision and then producing the final product. .

Researchers develop food in the form of tempeh into various kinds of food creations such as croffles, pizza, burgers, hot pudding and pancakes. Then a trial is carried out on the product that has been made in the form of a test organoleptic by administering a questionnaire to see the level of respondent's preference for the resulting product.

Table 3. Ingredients for Making Tempeh Croffles

Ingredients	Unit	Quantity
Flour	250	gr
Tempeh	1	pc
Milk	175	ml
Yeast	5	gr
Sugar	2	tbsp
Garam	½	tsp
Butter	120	gr
Chocolate	Depends	
Sangria Peanut	Depends	

Source: Results of data processing (2022)

How to Make Tempeh Croffle : 1) Put the flour, tempeh and salt in a small bowl then mix the warm liquid milk, instant yeast and two tablespoons of sugar. Wait 5-10 minutes for the yeast to expand. 2) Pour the yeast milk into the flour container and stir until well blended. Then pour the mixed ingredients on a lightly floured base then knead the dough until it comes together for about 5 minutes. 3) Round the dough and cover with plastic wrap. Leave it for 1 hour until it expands. After expanding, grease the surface with room

temperature butter until smooth then cut into 4 parts and stack. 4) Fold the dough into a roll up to 3 times, then store it in the freezer for 20-30 minutes. 5) Remove from the freezer and gently press the dough using a roller. After that flatten with a roller slowly until the dough becomes elongated in the shape of a parallelogram. 6) Cut into ten parts following the sides of the dough in the form of a parallelogram into a triangular shape. Take one part, split the tension at the bottom then pull it to the side a little and then roll it up. Do this until the dough runs out, and let it rest for 15 minutes until it rises. 7) Roll the croffles in granulated sugar then heat the mold waffles and roast the croffles until golden brown. 8) Once cool, sprinkle the croffles with powdered sugar. Croffle is ready to be served with toppings according to taste.

Table 4 Ingredients for Making Tempeh Pizza

Ingredients	Unit	Quantity
Flour	250	Gr
Yeast	6	gr
Sugar	2	tbsp
Oil	5	tbsp
Salt	½	tbsp
Hot Water	150	ml
Milk	1	Pc
Topping: tempeh, sausage , Paprika, Beef , Onion, Cheese, Butter, del monte Sauce.	Depends	

Source: Results of data processing (2022)

How to Make Tempeh Pizza : 1) Mix the yeast and sugar into the milk that has been mixed with warm water. Stir well and let stand for 3 minutes until the yeast foams. Then mix the flour and salt then add the milk then mix well and knead. Add vegetable oil and knead until the dough is smooth. 2) Let the dough rest for about 45 minutes until it expands. After 45 minutes, take the dough and divide it into according to the size of the pan. 3) Grease the pan with butter and flatten the dough. Give del monte sauce, tempeh and add other toppings. Preheat the oven for about 15 minutes at 200 degrees. Bake the pizza for 20-25 minutes on top and bottom heat. 4) Tempeh pizza is ready to be served.

Table 5 Ingredients for Making Tempeh Burger

Ingredients	Unit	Quantity
Bread	10	pcs
Lettuce	-	-
Tomato	2	pcs
Onion	1	pcs
Cheese	10	Pcs
Tomato Sauce	50	Gr
mayonnaise	50	gr
Tempeh	250	gr
egg	2	pcs
Butter	2	tbsp
Pepper	½	tsp
Coriander	1/2	tsp
Salt	1/2	tsp
Sesame Oil	1/2	tsp

Source: Results of data processing (2022)

How to Make Tempeh Burger : 1) The first is to make the burger filling by mixing the ingredients to make the tempe burger filling except margarine, then mix well and print with a diameter of 6 cm or according to taste. 2) Next, heat the margarine, fry the contents of the burger (tempe) until browned and remove when it is cooked. 3) Then divide the bread into 2 parts crosswise, bake the deep part of the bread for a while. Spread the bread with tomato sauce and mayonnaise then arrange the lettuce leaves, add the thinly sliced tomatoes, onions and cheese. 4) The next step is to add the tempeh filling that was made earlier and the tempeh burger is ready to be served.

Table 6 Ingredients for Making Hot Pudding Tempe

Ingredients	Unit	Quantity
Bread	6	pcs
Tempeh	1	pcs
Yeast	6	gr
Egg	2	pcs
Milk	250	ml
Sugar	2	tbsp
Chocolate Caramel	150	tbsp
Salt	¼	tsp

Source: Results of data processing (2022)

How to Make Tempeh Hot Pudding : 1) Stir well the sugar, salt and eggs and caramel chocolate. Add milk and mix well. 2) Arrange the sliced bread and tempeh into an aluminum foil cup then pour the egg mixture until the bread is submerged. Leave it for 15 minutes then add topping. 3) Bake the pudding for about 30 minutes then take it out. 4) Tempeh hot pudding is ready to be served

Table 7. Ingredients for Making Tempeh Serabi

Ingredients	Unit	Quantity
Rice Flour	250	gr
Tempeh	½	pcs
Onion	Depends	
Red Chili	3	pcs
Basil Leaves	2	pcs
Coconut Cream	150	ml
Hot Water	300	ml
Sugar	15	gr
Yeast	¼	tsp
Salt	1	tsp
Brown Sugar	5	pcs
Oil	Depends	

Source: Results of data processing (2022)

How to make tempeh pancakes : 1) Prepare a bowl for making dough. Combine coconut milk, rice flour, hot water, sugar and salt then mix well. Then add yeast and mix well. Cover with plastic wrap and let rest for 4060 minutes. 2) Puree the tempeh, chilies and garlic and shallots then fry in hot oil until you can smell the aroma. Stir well, add flavoring and mix in the basil leaves. 3) Heat the pancake mold over low heat. Pour the batter and cover briefly until half cooked. Add the fried tempeh and sliced chili then cook until cooked and the tempeh pancake is ready to be served.

In this study, the authors describe five characteristics of the sample, namely taste, interest, presentation and quality. This research is in the form of processed food creations made from tempeh, namely by making products in the form of croffles, pizza, burgers, hot pudding and pancakes. The organoleptic assessment was carried out by giving food processed by tempe to the panelists. Panelists are people or groups in charge of assessing the nature or quality of commodities based on subjective impressions (Ayustaningwarno, F. 2014). There are several levels based on expertise in conducting organoleptic assessments are as follows:

1. Individual Panelist
Individual panelists are highly skilled people with a very high specific sensitivity that is obtained because of talent or very intensive training. The individual panelists are very familiar with the nature, role and method of processing the material to be assessed and have excellent knowledge of organoleptic analysis methods. The advantages of using this panelist are high sensitivity, bias can be avoided, assessment is fast, efficient, and does not get tired quickly. Individual panelists are usually used to detect minor deviations and identify their causes. The decision is entirely up to someone.
2. Limited Panelists
The panelists were limited to 35 people who had high sensitivity so that bias could be avoided. This panelist is well acquainted with the factors in organoleptic assessment and can find out how to processing and the influence of raw materials on the final result. The decision is taken after discussion among its members.
3. Trained Panelists
Trained panelists consist of 1525 people who have fairly good sensitivity. To become a trained panelist, it is necessary to start with selection and training. This panelist can assess some of the nature of the stimulus so it is not too specific. The decision was taken after the data were statistically analyzed.
4. Somewhat Trained Panelists
The moderately trained panel of 1525 people had previously been trained to identify certain sensory traits. Some moderately trained panelists can be selected from a limited circle by testing their sensitivity first, while data that is highly deviant may not be used for data analysis
5. Untrained Panelists
Untrained panelists consist of more than 25 lay people who can be selected based on gender, ethnicity, social level and education. Untrained panelists are only allowed to assess simple organoleptic traits, such as preference traits, but discriminatory test data may not be used. For this reason, untrained panelists only consist of adults with the same composition of male panelists as female panelists.
6. Consumer Panelists
Consumer panelists consist of 30 to 100 people depending on the marketing target of a commodity. These panelists have very general characteristics and can be determined based on certain regions or groups.
7. Children's Panelists
Typical panelists are panelists who use children aged 3-10 years. Usually children are used as panelists in the assessment of food products that children like, such as chocolate, candy, ice cream.

Testing in this study was carried out by expert panelists with purposive sampling method consumer panelists consisting of the general public as many as 56 people. In the organoleptic assessment, it was carried out by giving food processed by tempe to panelists consisting of croffles, pizza, burgers, hot pudding and pancakes based on expertise. in conducting organoleptic assessment by the panelists.

In this study, the authors conducted a hedonic test by providing choices to consumers using a 5-point Likert scale. Based on (Hertanto, 2017) the advantage of the questionnaire instrument using the Likert Scale is that with five scales, the questionnaire is able to accommodate the answers of respondents who are neutral or in doubt. This is not found in the Likert Scale with four scales whose answers are neutral or undecided were omitted in the questionnaire. In addition, another reason for using a 5-point Likert Scale is because a 7-point or 13-point Likert scale will make it more difficult for respondents to distinguish each point of the scale and respondents find it difficult to process information.

IV. RESULT AND DISCUSSION

This study involved 56 consumer panelists, namely the general public. The primary data used in this study were obtained from organoleptic assessments carried out with processed tempe products for value by the

panelists. Based on four assessment factors, namely aroma, taste, texture and appearance of each tempe processed food. The results of the tempe processing that were given to the panelists were Croffle, Pizza, Burger, Hot Pudding and Serabi Tempe. The data collection technique was done by purposive sampling. The panelists who were selected to be involved in this study were asked to try the tempe processed food and give a score on the assessment sheet provided. The score for each assessment factor is on a scale of 1 to 5. A score of 1 for the worst processed tempe is up to 5 for the best processed tempe. This section will explain the descriptive statistics of each tempe processing result based on "lots of data, percentage, and mean. An overview of the research data "can be seen in the subsection below.

A. *Friedman Test*

Friedman test is known as a ranking test of a research product is used to display the ranking of food categories formed by researchers. This test can produce more accurate results and get final results that contain benchmarks in knowing consumer tastes for research products that have been made. The following are the results of the Friedman test based on the assessment of aroma, taste, texture and appearance of the processed tempe products that have been made.

Table 8 Friedman Test Based on Scent

Product	Mean Rank
Croffle	2,52
Pizza	2,45
Burger	2,23
Hot Pudding	2.64
Serabi Tempe	2,60

Based on the table above, it can be seen and concluded that the research product that first ranks based on scent is hot pudding tempe with a mean value of 2.64. The second rank is tempe pancakes with a mean value of 2.60. The third rank is tempe croffle with a mean value of 2.52. The fourth rank is tempe pizza with a mean value of 2.45. And the last rank is tempe burgers with a mean value of 2.23. From these data, it can be said that hot pudding tempe based on scent category was preferred by panelists compared than tempe croffle, tempe pizza, tempe burger and tempe pancake.

Table 9 Friedman Test Based on Flavor

Product	Mean Rank
croffle	1,85
Pizza	2,64
Burger	2,63
Hot Pudding	2,37
Serabi Tempe	2,68

According to the table above, it can be seen and concluded that the research product that first ranks based on flavor is tempeh pancakes with a mean value of 2.68. The second rank is tempe pizza with a mean value of 2.64. The third rank is tempe burgers with a mean value of 2.63. The fourth rank is hot pudding tempe with a mean value of 2.37. And the last rank is tempe croffle with a mean value of 1.85. From these data, it can be said that tempeh pancakes based on the taste category was preferred by the panelists compared than tempeh croffle, tempeh burgers, hot pudding tempeh and tempeh pancakes.

Table 10 Friedman Test Based on Texture

Product	Mean Rank
Croffle	2,89

Pizza	2,38
Burger	2,63
Hot Pudding	2,29
Serabi Tempe	1,68

Based on the table above, it can be seen and concluded that the research product that *first ranks* based on *Texture* is tempeh croffle with a mean value of 2.89. The second rank is *tempe* burger with a mean value of 2.63. The third rank is *tempe* pizza with a mean value of 2.38. The fourth rank is hot pudding *tempe* with a mean value of 2.29. And the last rank is *tempe* pancake with a mean value of 1.68. From these data, it can be said that tempeh croffles based on the texture category was preferred by the panelists compared than *tempe* pizza, *tempe* burgers, hot pudding *tempe* and tempeh pancakes.

Table 11 Friedman Test Based on Appearance

Nama Olahan	Mean Rank
Cruffle	2,74
Pizza	2,53
Burger	2,52
Hot Pudding	2,70
Serabi Tempe	3,04

According to the table above, it can be seen and concluded that the research product that *first ranks* based on Appearance is tempeh Pancake with a mean value of 3.04. The second rank is *tempe* croffle with a mean value of 2.74. The third rank is Hot Pudding *tempe* with a mean value of 2.70. The fourth rank is *tempe* pizza with a mean value of 2.53. And the last rank is *tempe* burger with a mean value of 2.52. From these data, it can be said that tempeh pancakes based on the Appearance category was preferred by the panelists compared than *tempe* pizza, *tempe* burgers, hot pudding *tempe* and tempeh croffle.

In the study of processed food tempeh as a new food ingredient in the form of tempeh croffle, tempe pizza, tempe burgers, hot puddings tempe and tempeh pancakes, the level of preference is quite varied. Researchers can determine the level of preference of the panelists from predetermined aspects, namely aroma, taste, texture and appearance. The test used in this study used an organoleptic test consisting of hedonic quality. In the hedonic quality test criteria, researchers will provide an assessment of four predetermined aspects. When viewed from the overall mean value, the panelists who received the level of preference and were accepted by the panelists were processed tempeh in the form of pizza with a mean value of 3.86. Based on the friedman test, it can be seen the level of panelists. preference for processed tempe products based on aspects that have been determined by the researchers. From the aspect of scent, the results of the study stated that processed tempe products in the form of hot pudding were preferred by the panelists compared to processed tempeh in the form of croffles, pizza, burgers and tempeh pancakes. From the aspect of taste, the results of the study stated that the panelists preferred processed tempe products in the form of tempeh pancakes compared to processed tempeh in the form of croffle, burgers, hot puddings and tempeh pancakes. From the aspect of texture, the results of the study stated that the panelists preferred processed tempe products in the form of croffles compared to processed tempeh in the form of pizza, burgers, hot pudding and tempeh pancakes. And from the aspect of appearance, the results of the study stated that processed tempe products in the form of tempeh pancakes were preferred by the panelists compared to processed tempeh in the form of croffles, pizza, burgers, and hot pudding.

From the research results that have been analyzed, in general the creativity of tempe products received is quite good in terms of taste, aroma, texture, and appearance. However, the results of the assessment given by the panelists on average based on the Friedman test did not explain that this processed product was really tasty and interesting. The results given by the panelists were forgotten by the panelists' consideration of the aroma, taste, texture and appearance of croffle, pizza, burgers, hot puddings, and pancakes that were created before this tempeh product existed. So that the taste, aroma, texture and appearance displayed by this tempe processed product were strange for some panelists.

V. CONCLUSION

This study aims to popularize processed products from tempeh-based ingredients and determine the level of preference for tempe-based processed products in terms of aroma, taste, texture and appearance. This research uses organoleptic test as a test used in decision making. Based on the results of the study, the conclusions obtained are as follows: 1) Based on the Friedman test, it can be seen that the panelists' level of preference for processed tempe products is based on aspects that have been determined by the researcher. From the aspect of aroma, processed tempe products in the form of hot pudding are preferred. From the aspect of taste, processed tempe products in the form of tempeh pancakes are preferred by the panelists. From the aspect of texture, processed tempe products in the form of croffles are preferred by the panelists. And from the aspect of appearance, processed tempe products in the form of tempeh pancakes are preferred by the panelists. 2) In general, tempe creative products are received quite well in terms of taste, aroma, texture, and appearance. However, the results of the assessment given by the panelists are on average based on the Friedman test or ranking test for a product where testing the aroma, taste, texture and appearance gets different results in each aspect, where the results of the assessment given by the panelists are thought to be influenced by the thoughts of the panelists. about the aroma, taste, texture and appearance by food croffle, pizza, burgers, hot puddings, and pancakes that were created before this tempeh product existed. So that the taste, aroma, texture and appearance displayed by this tempe processed product became strange for some panelists.

Suggestions that can be given for further research is that in the selection of panelists or in the implementation of the assessment, it is better to first explain the processed product and remind the panelists to give a neutral value without comparing it with the original shape or taste of the modified food. The existence of this recipe for processed food creations made from tempeh, in the future, it is necessary to test the resistance of processed food at room temperature and at room temperature stored in a chiller, in the future it can be added to the uniqueness of other processed creations made from tempe, marketing education about tempe-based preparations so that the wider community can know that the basic ingredients of tempeh can be used as unique food creations that are delicious to enjoy.

Through the results of the research that has been carried out in this study, there are several plans for sustainability research that can be carried out, namely: 1) Making developments related to processed tempe in the form of tempeh flour which has the aim of eliminating the distinctive taste of tempe and will be more suitable for sweet foods. 2) Make several additional variants of processed tempeh flour such as cakes tarts, cookies to steamed sponge. 3) Conduct sustainable activities by conducting seminars related to research results to provide explanations regarding the product innovation findings obtained.

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