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Use of Seitan and White Oyster Mushroom into Meatballs as Worth-Selling Tourism Food Product

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ABSTRACT

Seitan and white oyster mushrooms can be used in making meatballs, due to the lack of nutritional content in the choice of ordinary mushroom meatballs so the author makes a variant of mushroom meatballs with seitan which has many nutrients and higher nutritional value and can be an option for someone who wants to implement a healthy lifestyle and protein diet. The type of research used in this study is experimental research using organoleptic test of seitan and white oyster mushroom meatballs using seitan and oyster mushrooms. The number of samples is 10 to 20, and Consumer Panelist consisting of 30 to 100 people. The panelists who wrote themselves came from the neighborhood where they lived in the Bandung area, including students, lecturers, and various other professions. The production cost of making comparative meatballs is cheaper, at Rp. 850. The total cost of seitan and white oyster mushroom meatballs is Rp. 29,389, while comparative meatballs cost is Rp. 28,539. This difference occurs because some of the basic ingredients for making seitan and white oyster mushroom meatballs are more expensive, but the differences are not to significant, the results show that both meatballs have the same average value of 3.7. In addition, from several aspects both have their respective advantages and disadvantages, but the difference in value is not too far only 0.1-0.3 only, both can still be categorized as delicious, tasty, chewy and attractive. Therefore, from the above assessment, the experiment of Seitan and white oyster mushroom meatballs is declared suitable for marketing and sale.

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1. INTRODUCTION

A healthy lifestyle is one that pays attention to all aspects of one's health condition. Not only about food, but also the person's habits in living a lifestyle. Health is an important thing that supports all the activities and activities you do. Implementing a healthy lifestyle can certainly make a person avoid various health problems and disorders, such as attacks of disease bacteria and viruses. That is why it is important to maintain a healthy lifestyle. A healthy lifestyle can be assessed from a person's food, drink, nutritional intake, and exercise habits. Basically, the application of a healthy lifestyle is identical to the food factors that are usually consumed (Fitriani, 2018).

Vegetarianism is a lifestyle that involves eating a diet without consuming foods of animal origin, such as beef, mutton, pork, poultry, and seafood, such as fish and shellfish. A vegetarian diet consists of vegetables, fruits, nuts and seeds. Vegetarians can be categorized into several types, namely: Lacto-ovo-vegetarian, which is a diet that does not consume red meat, poultry meat, and fish, but consumes eggs, milk and processed products, including cheese and yoghurt. Lacto-vegetarian, which is a diet that does not consume red meat, poultry meat, fish, and eggs, but consumes milk and its derivative products. Ovo-vegetarian, which is a diet that does not consume all foods derived from animals and their derivative products, but makes an exception for eggs (Oktaviani et al., 2021).

Meatball is a processed ground meat product mixed with flour and spices and other ingredients which are mashed, then formed into rounds and then boiled until cooked. Meatball is also a meat product that is widely known and favored by the Indonesian people as a food that is considered cheap and favored by all levels of Indonesian society as a food that is considered cheap and favored by all levels of society, both children, adolescents, and parents. In terms of nutrition, Meatball is a food that has a high content of animal protein, minerals, and vitamins. According to Indonesian National Standard-SNI 01 - 3818-2014 meatballs have a water content of 70%, a minimum protein content of 11%, a maximum fat content of 10% (Trowulan, 2016).

White oyster mushroom (*Pleurotus ostreatus*) is one type of consumption mushroom that is quite popular and is also useful for the body because it is highly nutritious and low in fat. White oyster mushrooms belong to the Basidiomycetes group, which is a group of white rot fungi characterized by the growth of white mycelium on the entire growing medium. White oyster mushroom is a type of wood mushroom that has a higher nutritional content compared to other types of wood mushrooms. White oyster mushrooms contain higher protein, fat, phosphorus, iron, thiamin and riboflavin than other types of mushrooms (Aini, 2018).

According to Riyanto (2010) the nutritional value of oyster mushrooms per 100 grams is as follows: Energy 367 kcal, protein 17.72g, fat 2.3g, crude fiber 8.7g, calcium 21mg, iron 32mg, thiamine 0.21mg, riboflavin 7.09mg, carbohydrate 81.8. This mushroom has the ability to increase metabolism and regulate autonomic nerve function. It is also used for the treatment of hepatitis, digestion, duodenum and stomach.

Meanwhile, the term seitan is thought to be of Japanese origin, with the word 'sei' meaning 'made of' and the word 'tan' coming from the first character in the word 'tanpaku' meaning 'protein'. The term was coined in the early 1660s by Japanese philosopher and founder of the macrobiotic diet George Ohsawa brought it to the West in the early 1660s. According to Véron (2016), seitan is a meat substitute made entirely from hydrated gluten, the main protein found in wheat. It is sometimes also called wheat gluten, wheat meat, wheat protein, or simply gluten.

The following are the nutritional values of seitan per 129 grams: 162 kcal energy, 0.9g fat,

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0 mg cholesterol, 31.9g protein, 6.9g carbohydrate, 0.4g dietary fiber, 0g sugar, 16.7mg sodium, 56.1mg potassium (Purwanto et al 2015). The advantages of artificial meat from seitan include being safer from bacterial and viral contamination that often attacks livestock, long-lasting storage, does not rot quickly and is cheap because it is made from flour at an affordable price. Vegetarian meatball engineering has been carried out from seitan staples combined with oyster mushrooms.

Based on the explanation above, seitan and white oyster mushrooms can be used in making meatballs, due to the lack of nutritional content in the choice of ordinary mushroom meatballs so the author makes a variant of mushroom meatballs with seitan which has many nutrients and higher nutritional value. In addition, seitan and white oyster mushroom meatballs can be an option for someone who wants to implement a healthy lifestyle and protein diet.

The benefits of experimental research for readers are as a reference for utilizing seitan and white oyster mushroom meatballs as food preparations that are rich in nutrients and increase knowledge of agricultural products in Indonesia.

2. LITERATURE REVIEW

2.1. Seitan

Figure 1. Seitan
Source: Google, 2022

The term seitan is thought to be of Japanese origin, with the word 'sei' meaning 'made of' and the word 'tan' coming from the first character in the word 'tanpaku' meaning 'protein'. The term was coined in the early 1660s by Japanese philosopher and founder of the macrobiotic diet George Ohsawa brought it to the West in the early 1660s. According to Berardy (2012), seitan is a meat substitute made entirely from hydrated gluten, the main protein found in wheat. It is sometimes also called wheat gluten, wheat meat, wheat protein, or simply gluten. Seitan is produced by kneading wheat flour with water to develop sticky strands of gluten protein.

The dough is then rinsed to remove the starch. What remains is a sticky mass of pure gluten protein that can be seasoned, cooked, and used in vegan or vegetarian dishes as a meat substitute (Chakim et al 2013).

Table 1. Nutrition Content Of Seitan per 129gr

Nutrition Content	Amount
Energy	162 kcal
Fat	0,9 gr
Cholesterol	0 mg
Protein	31,9 gr
Carbohydrate	6,9 gr

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Nutrition Content	Amount
Food Fibre	0,4 gr
Sugar	0 gr
Sodium	16,7 mg
Potassium	56,1 mg

Source: Maulana, 2012

2.2. White oyster Mushroom

Figure 2. White Oyster Mushrooms
Source: Google, 2022

White oyster mushroom (*Pleurotus ostreatus*) is one type of consumption mushroom that is quite popular and is also useful for the body because it is highly nutritious and low in fat (Steviani S 2011). White oyster mushrooms belong to the Basidiomycetes group, which is a group of white rotten mushrooms characterized by the growth of mycelium. White rotten mushrooms are characterized by the growth of white mycelium on the entire growing medium. White oyster mushroom is a type of wood mushroom that has a higher nutritional content compared to other types of wood mushrooms. White oyster mushrooms contain higher protein, fat, phosphorus, iron, thiamine and riboflavin than other types of mushrooms (Kurniawan, 2011).

Table 2. Nutritional content of white oyster mushroom per 100g

Nutritional Content	Amount
Energy	367 kcal
Protein	17,72 gr
Fat	2,3 gr
Crude Fiber	8,7 gr
Calcium	21 mg
Iron	32 mg
Thiamin	0,21 mg
Riboflavin	7,09 mg
Carbohydrates	81,8 gr

Source: Maulana, 2012

2.3. Where the commodity grows and spreads

In Indonesia, there are many food commodities that have the potential to be developed, for example, such as mushroom products. One type of mushroom that grows a lot in Indonesia is oyster mushroom. Based on data from the Ministry of Agriculture (2018-2020), the largest oyster mushroom plantations are in Central Java province such as Cilacap, Purbalingga,

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Banjarnegra, Banyumas, Kebumen, in detail can be seen in the following table:

Table 3. Data on Harvest Area and Total Mushroom Production in Central Java Province

No	Province	Harvested Area (m2)	Total Production (kg)
1	Cilacap	20.150	100.534
2	Banyumas	53.031	329.897
3	Purbalingga	517	69.375
4	Banjarnegara	22.805	131.807
5	Kebumen	6.189	59.009

Source: Central Bureau of Statistics, 2021

3. METHODS

The type of research used in this study is experimental research, according to Nasehudin & Gozali (2012) Experimental research can be interpreted as a research method used to seek the effect of certain treatments on others under controlled conditions. In this study the authors are interested in using oyster mushrooms and seitan in making meatballs, but in making meatballs from seitan and white oyster mushroom still use additional ingredients as support.

Data collection technique is a technique or method used by researchers to collect data. This is done to obtain information that will be needed in order to achieve research objectives. According to (Semiawan, 2010) "The data collection method is the most strategic step in research, because the main purpose of research is data collection". The data collection techniques that will be carried out by the author in writing this final project are:

a. Literature study

According to (Somantri, 2005), "Literature study is a search for sources or expert opinions on a matter related to research objectives". It can be said that literature study is an assessment of several literature sources related to the main variables or a research topic. Researchers look for references and collect information related to category shift theories by reviewing several written sources such as books, journals, research results, articles, and other sources.

b. Observation

Observation is a research activity by making direct observations of an object, observation can be done by questionnaire, interview, or test. According to Sarwono (2006) the key to the success of observation as a technique in data collection is very much determined by the researcher himself, because the researcher sees and listens to the object of research and then the researcher concludes from what is observed. The researcher who gives meaning to what he observes in reality and in a natural context, is the one who asks and also sees how the relationship between one aspect and another aspect of the object he is researching.

c. Panelist Assessment

In the data collection technique, the author will conduct an organoleptic test of seitan and white oyster mushroom meatballs using seitan and oyster mushrooms (Rahayu WP 2001). In the data collection method using a panelist assessment format, where the author will collect data using an assessment format or commonly called a questionnaire. Questionnaire is a data collection technique that is carried out by giving a set of questions or written statements to respondents to answer. In this case the respondent is called a panelist, the panelist will be asked for his personal response about liking or otherwise (dislike).

- Professional Panelists. Before filling out the questionnaire the panelist must do an organoleptic test. Organoleptic test is a way of testing using the human senses as the main

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tool to assess the quality of a product. Assessment using this sensory tool includes specifications such as appearance, aroma, taste, and concentration/texture as well as several other factors needed to assess the product. There are various kinds of panelists in organoleptic test assessment. Each is based on expertise in conducting organoleptic assessments. According to Kurniawan (2011) the number of professional panelists "for simple experimental research, which uses experimental groups and control groups, the number of samples is 10 to 20".

- Consumer Panelist. According to Khairunnisa & Syukri Arbi (2019), the consumer panel is the marketing target of the product consisting of 30 - 100 people. This panel must be able to represent the target market based on certain groups / regions. Organoleptic quality assessment can be done in the market or door to door. The panelists who wrote themselves came from the neighborhood where they lived in the Cianjur area, including students, lecturers, and various other professions.

d. Data Analysis Technique

Data analysis in mixed methods research is closely related to the type of strategy chosen. This analysis can be based on quantitative (descriptive and inferential analysis of numbers) and qualitative (thematic description and analysis of text or images) approaches, or between these two approaches. The data analysis procedure in this research follows the process that must be carried out by the author as in other types of research which in general is to prepare the type of data to be analyzed, explore the data, analyze the data to answer research questions, display and validate the data. It is just that the data analysis technique does not have to prioritize quantitative or qualitative first. It is possible that quantitative data analysis requires deeper analysis so that qualitative data analysis is then combined at the same time, and vice versa. The data that has been obtained is analyzed using a qualitative approach. The results of the analysis sometimes provide a different picture between the data in the research and the results of the interview. The difference is then analyzed again by linking to the theory and opinions of experts, so that it is expected to make a positive contribution to future research. The data from the questionnaire in this study is quantitative data which will be analyzed descriptively by percentage with the following steps according to Riduan: a. Calculate the respondent's score and each aspect or sub-variable. b. Recap the score. c. Calculating the average value. d. Calculating the percentage with the formula: DP = n = N = Descriptive Percentage (%). Empirical score (Score obtained) Ideal Score for each question item to determine the type of descriptive percentage obtained by each indicator in the variable, and the descriptive percentage calculation is then interpreted into a sentence.

4. RESULTS AND DISCUSSION

4.1. Pre-experiment results

This Pre-Experiment was conducted by the author as an experiment to determine the use of seitan and white oyster mushroom as ingredients for making Seitan and white oyster mushroom meatballs. Experiments and observations conducted by the author are a process of collecting information data with the aim of improving, modifying or developing the product being experimented. Pre-experiments are also a benchmark for whether Seitan and white oyster mushroom meatballs are successful or not. This also determines the final quality of the product. From several experiments, failure often occurs, but the author always tries to get the best results, please note that all pre-experiments use the same processing method.

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Table 4. Pre-Experiment

No	Date	Description	Figure
1	August 28, 2023	Results of the first experiment: using 150 grams of dry seitan, 350 grams of wet seitan, 500 grams of oyster mushrooms and 100 grams of onions. Produces meatballs that are so soft that they cannot be shaped and easily fall apart when boiled. For flavor, it is sufficient, only lacking white pepper.	 Figure 3. Pre-experiment 1 Source: author's documentation, 2023
2	September 21, 2023	Results of the second experiment: using a ratio of 25:25:50 between dry seitan, wet seitan, and oyster mushrooms. Produced meatballs that were dense but still mushy and not chewy.	 Figure 4. Pre-experiment 2 Source: author's documentation, 2023
3	September 25, 2023	The results of the third experiment: using a ratio of 25:25:50 between dry seitan, wet seitan, and oyster mushrooms and adding 50 grams of tapioca flour. Produced meatballs as desired, not mushy, chewy, and almost resembled the shape of the comparative meatballs.	 Figure 5. Pre-experiment 3 Source: author's documentation, 2023

Source: Author's Processed Results, 2022

Table 5. Experiment Result

The use of dried seitan, sump seitan, and oyster mushrooms in a ratio of 150gr: 350gr:500gr		The use of dried seitan, sump seitan, and oyster mushroom in a ratio of 25:25:50		The use of dried seitan, sump seitan, and oyster mushroom (With added tapioca) in a ratio of 25:25:50	
Results: 5 servings		Results: 5 servings		Results: 5 servings	
Ingredients Quantity	Amount	Ingredients Quantity	Amount	Ingredients Quantity	Amount
Wet seitan	150gr	Wet seitan	250gr	Wet seitan	250gr
Dry seitan	350gr	Dry seitan	250gr	Dry seitan	250gr

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The use of dried seitan, sump seitan, and oyster mushrooms in a ratio of 150gr: 350gr:500gr	The use of dried seitan, sump seitan, and oyster mushroom in a ratio of 25:25:50	The use of dried seitan, sump seitan, and oyster mushroom (With added tapioca) in a ratio of 25:25:50
Oyster mushroom 500gr Onion 100gr white pepper 6gr salt 2 tsp	Oyster mushroom 500gr Onion 100gr white pepper 9gr salt 3 tsp	Oyster mushroom 500gr Onion 100gr white pepper 9gr salt 3 tsp tapioca 2 tbsp
		
Figure 6 experiment result 1 Source: author's documentation, 2023	Figure 7 experiment result 2 Source: author's documentation, 2023	Figure 8 experiment result 3 Source: author's documentation, 2023
For the first experiment, these seitan and white oyster mushroom meatballs had a brownish color, besides that in terms of texture, they were very soft, difficult to shape and crumbled easily. Even when boiled, it disintegrates and dissolves with water.	For the second experiment, the seitan and white oyster mushroom meatballs had a grayish color, the texture was malleable but still mushy, crumbly, and slightly hard for the taste was sufficient compared to before.	For the third experiment, seitan and white oyster mushroom meatballs still have the same color, which is grayish, the results of the texture are easy to shape, not mushy and not easily crushed, it is similar to the comparative, for taste it is still the same as before.

Source: Author's Processed Results, 2023

Production Cost of Making seitan and white oyster mushroom Meatballs and Comparative Meatballs

Production costs are costs incurred to process materials into finished products that are ready for sale. Broadly speaking, these production costs are divided into raw materials, direct labor costs and overhead costs (Sulistiani et al., 2021; Nuryanti 2022; Pricestari et al 2015).

Table 6. Calculation of Production Costs in Making Meatball Using Seitan and White Oyster Mushroom (100%)

No	Material	Ammount	Unit	Price/kg	Price/unit
1	High Protein Flour	1	kg	Rp 15.000	Rp 15.000
2	Onion	100	gr	Rp 25.000	Rp 2.500
3	Water	500	ml	Rp 0	Rp 0
4	Oyster Mushroom	500	gr	Rp 20.000	Rp 10.000
5	Tapioca Flour	50	gr	Rp 11.000	Rp 550
6	Salt	10	gr	Rp 5.000	Rp 50

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No	Material	Ammount	Unit	Price/kg	Price/unit
7	Oil	10	ml	Rp 18.000	Rp 180
8	Sugar	5	gr	Rp 20.000	Rp 400
9	White Pepper	9	gr	Rp 78.000	Rp 709
	Total Cost per 1,000gr				Rp 29.389

Source: Author's Processed Results, 2023

Table 7. Calculation Of Production Costs On Making Comparative Matball

No	Material	Ammount	Unit	Price/kg	Price/unit
1	Oyster mushrooms	1.000	gr	Rp 20.000	Rp 20.000
2	Garlic	100	gr	Rp 21.000	Rp 2.100
3	Egg white	100	gr	Rp 40.000	Rp 4.000
4	Tapioca flour	100	gr	Rp 11.000	Rp 1.100
5	Salt	10	gr	Rp 5.000	Rp 50
6	Oil	10	ml	Rp 18.000	Rp 180
7	Sugar	5	gr	Rp 20.000	Rp 400
8	White pepper	9	gr	Rp 78.000	Rp 709
	Total Cost per 1,000gr				Rp 28.539

Source: Author's Processed Results, 2023

Table 8. Comparison of Total Production Costs of Seitan and white oyster mushroom meatballs and Comparative Meatballs

Research Products	Total Production Cost per Recipe
Seitan and white oyster mushroom meatballs	Rp 29.389
Comparative Meatballs	Rp 28.539
Packaging cost	Rp 4.250
Sticker cost	Rp 2. 763

Source: Author's processed results, 2023

Based on the data above, the production cost of making comparative meatballs is cheaper Rp. 850 The total cost of seitan and white oyster mushroom meatballs is Rp. 29,389 while comparative meatballs cost is Rp. 28,539, this happens because some of the basic ingredients for making seitan and white oyster mushroom meatballs are more expensive, but the differences are not to significant

From the assessment of professional panelists and consumer panelists who have been carried out on seitan and white oyster mushroom meatballs with comparative meatballs, the results are obtained on each product. Below the author will explain the criteria and values that are a reference for panelists to fill out a questionnaire, both from professional panelists totaling 10 people and consumer panelists totaling 30 people.

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Table 9. Panelist Assessment Criteria

Criteria	Score
Very tasty / Very delicious / Very chewy / Very attractive	5
Tasty / Delicious / Chewy / Attractive	4
Quite tasty / Quite delicious / Quite chewy / Quite Attractive	3
Less Tasty / Less Delicious / Less Chewy / Less Attractive	2
Not tasty / not delicious / not chewy / not Attractive	1

Source: Author's Processed Results, 2023

From the data above, the author will analyze how to calculate the average answer based on the scores of the panelists and based on the predetermined values. To determine the taste of Seitan and white oyster mushroom meatballs with Comparative meatballs, the total score is needed through the interval of panelist assessment criteria with the calculations below.

According to Nasehudin & Gozali (2012), the formula for the average difference in assessment is as follows.

$$I = \frac{(n1-n2)}{K}$$

Description:

K = Number of classes

I = Class interval / class length

Ni = Highest value

N2 = Lowest value

Then get the class interval as follows:

$$I = \frac{(5-1)}{5} = \frac{4}{5} = 0{,}8$$

The interval distance of the panelist criteria is 0.8. The following is a table of panelist average score criteria intervals needed to determine the final result of the total score.

Table 10. Panelist Assessment of The Product

Criteria	Interval
Very tasty / Very delicious / Very chewy / Very attractive	1,00 – 1,79
Tasty / Delicious / Chewy / Attractive	1,80 – 2,59
Quite tasty / Quite delicious / Quite chewy / Quite Attractive	2,60 – 3,39
Less Tasty / Less Delicious / Less Chewy / Less Attractive	3,40 – 4,19
Not tasty / not delicious / not chewy / not Attractive	4,20 – 5,00

Source: Author's Processed Results, 2023

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Table 11. Results of the Combined Assessment from Professional panelists and Consumer Panelists of Seitan and white oyster mushroom meatballs (n=40)

No	Assessment Aspect	5		4		3		2		1		Total f(x)	— X	Category
		f	f(x)	f	f(x)	f	f(x)	f	f(x)	f	f(x)			
1	Aroma	8	40	21	84	5	18	4	8	-	-	150	3,7	Tasty
2	Taste	10	50	17	68	12	36	2	4	-	-	158	3,9	Delicious
3	Texture	9	45	18	72	10	30	3	6	-	-	153	3,8	Chewy
4	Appearance	7	30	17	68	12	36	6	12	-	-	146	3,6	Attractive
	TOTAL	34	170	73	292	41	123	13	26	-	-	601		3,7

Source: Author's processed results, 2023

Information:
n = Number of samples
f = Frequency
f(x) = Frequency that has been multiplied by a value
Σf(x) = Total number of f(x) from one category
$\bar{X}$ = Average value

From the data in the table of the combined assessment results of professional panelists and consumer panelists above for seitan and white oyster mushroom meatballs carried out on 40 (forty) panelists, it can be seen that the score on each aspect is aroma, taste, texture, and appearance as follows:

Results of Aroma Aspect Assessment

The results of the assessment of seitan and white oyster mushroom meatballs in the aroma aspect of the summation of the combined assessment results of professional panelists and consumer panelists totaling 40 people scored 150 points with an average value of 3.7 points. Therefore, the assessment for the products get a Tasty category.

Results of Taste Aspect Assessment

The results of the assessment of seitan and white oyster mushroom meatballs in the aspect of taste from the summation of the combined assessment results of professional panelists and consumer panelists totaling 40 people scored 158 points with an average value of 3.9 points. Therefore, the assessment of the taste aspects for the products get a delicious category.

Results of Texture Aspect Assessment

The results of the assessment of seitan and white oyster mushroom meatballs in the texture aspect of the summation of the combined assessment results of professional panelists and consumer panelists totaling 40 people scored 153 points with an average value of 3.8 points. Therefore, the assessment of the texture aspect for the products get the chewy category.

Results of the Appearance Aspect Assessment

The results of the assessment of seitan and white oyster mushroom meatballs in the appearance aspect of the summation of the combined assessment results of professional panelists and consumer panelists totaling 40 people scored 146 points with an average value of 3.6 points. Therefore, the assessment of the appearance aspect for the products get an attractive category.

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Overall assessment results

The results of the assessment of seitan and white oyster mushroom meatballs in the overall aspect of the summation of the combined assessment results of professional panelists and consumer panelists totaling 40 people scored 601 points with an average value of 3.7 points. Therefore, the overall assessment for the products is Tasty, delicious, chewy, and attractive.

Table 12. Results of Combined Assessment from Professional Panelists and Consumer Panelists of Comparative Meatballs (n=40)

No	Assessment Aspect	5		4		3		2		1		Total f(x)	— X	Kategori
		f	f(x)	F	f(x)	f	f(x)	f	f(x)	f	f(x)			
1	Aroma	8	40	17	68	13	39	2	4	-		151	3,7	Tasty
2	Taste	8	40	20	80	10	30	2	4	-		154	3,8	Delicious
3	Texture	8	40	19	76	9	27	4	8	-		151	3,7	Chewy
4	Appearance	6	30	20	80	14	42	-	-	-		152	3,8	Attractive
	TOTAL	30	150	76	304	46	138	8	16	-	-	608		3,7

Source: Author's processed results, 2023

Information:
n = Number of samples
f = Frequency
f(x) = Frequency that has been multiplied by a value
Σf(x) = Total number of f(x) from one category
$\bar{X}$ = Average value

From the data in the table of the combined assessment results of professional panelists and consumer panelists above for comparative meatballs carried out on 40 (forty) panelists, it can be seen that the score on each aspect is aroma, taste, texture, and appearance as follows:

Results of Aroma Aspect Assessment

The results of the assessment of comparative meatballs in the aroma aspect of the summation of the combined assessment results of professional panelists and consumer panelists totaling 40 people scored 151 points with an average value of 3.7 points. Therefore, the assessment for the products get a Tasty category.

Results of Taste Aspect Assessment

The results of the assessment of comparative meatballs in the aspect of taste from the summation of the combined assessment results of professional panelists and consumer panelists totaling 40 people scored 154 points with an average value of 3.8 points. Therefore, the assessment of the taste aspects for the products get a delicious category.

Results of Texture Aspect Assessment

The results of the assessment of comparative meatballs in the texture aspect of the summation of the combined assessment results of professional panelists and consumer panelists totaling 40 people scored 151 points with an average value of 3.7 points. Therefore, the assessment of the texture aspect for the products get the chewy category.

Results of the Appearance Aspect Assessment

The results of the assessment of comparative meatballs in the appearance aspect of the summation of the combined assessment results of professional panelists and consumer panelists totaling 40 people scored 152 points with an average value of 3.8 points. Therefore, the assessment of the appearance aspect for the products get an attractive category.

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Overall assessment results

The results of the assessment of Comparative meatballs in the overall aspect of the summation of the combined assessment results of professional panelists and consumer panelists totaling 40 people scored 608 points with an average value of 3.7 points. Therefore, the overall assessment for the products is Tasty, delicious, chewy, and attractive.

5. CONCLUSION

Based on the data, the comparison results for the average assessment of the combined professional panelists and consumer panelists on seitan and white oyster mushroom meatballs and comparative meatballs in the aspects of aroma, taste, texture, and appearance are as follows:

1. In terms of aroma, the value of seitan and white oyster mushroom meatballs made from oyster mushrooms and seitan and comparative meatballs. Seitan and white oyster mushroom meatballs get a score of 3.7 while comparative meatballs get a score of 3.7. Both are categorized as delicious.
2. In terms of flavor, the score of seitan and white oyster mushroom meatballs is 0.2 lower than the comparative meatballs. Seitan and white oyster mushroom meatballs get a score of 3.6 while comparative meatballs get a score of 3.8. However, both are still categorized as delicious.
3. In terms of texture, the value of seitan and white oyster mushroom meatballs is 0.2 superior to comparative meatballs. Seitan and white oyster mushroom meatballs get a score of 3.9 while comparative meatballs get a score of 3.7. However, both are still categorized as chewy.
4. In terms of appearance, the seitan and white oyster mushroom meatballs scored 0.3 lower than the comparative meatballs, the seitan and white oyster mushroom meatballs scored 3.5 while the comparative meatballs scored 3.8. However, both are still categorized as attractive.

Based on the data that has been obtained and processed by the author, the results show that both meatballs have the same average value of 3.7. In addition, from several aspects both have their respective advantages and disadvantages, but the difference in value is not too far only 0.1-0.3 only, both can still be categorized as delicious, tasty, chewy and attractive. So from the above assessment, the experiment of Seitan and white oyster mushroom meatballs is declared suitable for marketing and sale.

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