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Consumer Acceptance Test of Purple Uwi (*Dioscorea Alata L*) Mousse Tape

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Mousse; Tape; Purple Uwi

ABSTRACT
Purple uwi tape mousse is a frozen dessert type of soft pudding made from the main ingredients of purple uwi tape and cream. The use of purple uwi tape, besides providing color and taste, also extends the life of the purple yam tape and adds nutritional content to the mousse. The objectives of this research are to determine the characteristics of purple uwi tape mousse, to determine consumer acceptance of purple uwi tape mousse, and to know the nutritional content of purple uwi tape mousse. The panellists' acceptance of the purple uwi tape mousse through the results of the hedonic test showed that what the panellists liked most was the mousse with the addition of 100% purple uwi tape in the M3 code. The characteristics resulting from mousse with this recipe formula are that it has a sweet, savoury, slightly salty taste, a distinctive aroma of tape and milk, a soft texture, and a bright pink color so that it attracts consumer interest. Purple uwi tape mousse nutrition per cup measuring 8 oz/ounce, or 117 g, contains 0.572 g fibre, 5.44 g protein, 0.242 g flavonoids, 41.9 g carbohydrates, and 28.1 g fat.

1. Introduction

Indonesia has a diversity of traditional foods. One of the traditional foods widely known in the community is tape. Tape is a food produced from the fermentation process of carbohydrate foods, such as cassava and glutinous rice. Tape can be made from cassava or cassava and the result is called cassava tape by Hidayat et al., (2006) (Dirayati et al., 2017). Food stuffs that contain carbohydrates other than cassava are purple *uwi*.

Uwi ungu (*Dioscorea alata*) is one of the food ingredients that has a lower content of sugar and fat and is free of gluten, high in fibre and flavonoids, so it is safe to be consumed by people with diabetes and autism and supports diet programs (Sakthidevi & Mohan, 2013). Uwi purple is a functional food that supplements fibre and minerals in the body (Hapsari, 2014).

The most straightforward process of purple uwi is steaming to add flavor and consumption, then processing it into the tape to increase its quality. Purple uwi tape tastes sweet and slightly sour fresh, smells of tape (typical of fermentation), and the texture is softer and moister. Purple uwi tape can be served directly or reprocessed into other more exciting preparations, such as purple uwi tape mousse. The impression of the uwi tape produced on the mouse is a refreshing sour taste; the fermentation of the uwi tape influences this. The fresh sour taste effect of purple tape is suitable for mice, which are served in a cold state. In addition, it also gives a slightly purplish pink effect that is attractive and safe for health (Najah et al., 2023).

Mousse is a different type of pudding because it has a soft and foamy texture. Mousse, in its dish, functions as a dessert, which is served frozen and can be complemented by cake. The main ingredients for making mousse are whipped cream, egg whites, or gelatin. Mousse has a soft and smooth taste, resembling ice cream by Farida, (2008) in Yasjudani (2017).

Several studies have shown that the use of fermented ingredients in food products can increase their attractiveness and nutritional value. For example, research by Najah et al. (2023) shows that ice cream that uses purple uwi as a base ingredient has interesting taste and aroma characteristics. In addition, research by Ajid et al. (2022) emphasizes the potential of purple uwi in various food product applications, including as an additional ingredient in making mousse.

The purpose of this study is: To find out the Characteristics of Purple Uwi Tape Mousse: Analyze the taste, aroma, texture, and color of the mousse produced, to find out the Consumer Acceptance of Purple Uwi Tape Mousse: Measure the level of consumer preference through a hedonic test that involves assessing taste, aroma, texture, and appearance. And Knowing the Nutritional Content of Purple Uwi Tape Mousse: Analyzing the content of fiber, protein, flavonoids, carbohydrates, and fats in mousse products to determine the nutritional value offered.

2. Materials and Methods

Research Plan

The author's experiment was to make *Purple Uwi Mousse* Tape; the experiment was carried out in 2 stages. The first stage is the manufacture of purple uwi tape. The second stage of making purple uwi tape *mousse* was carried out three times. Each experiment made four products with different percentages of purple uwi tape.

The percentage of purple uwi tape is compared to *whipped cream* as the main ingredient in making *mice.* The four products are a comparison of the percentage of purple uwi tape as much as 50%, 75%, 100%, and 125% of the use of *whipped cream*, followed by the addition of purple uwi tape of 50% is called M1 code product, the addition of 75% of purple uwi tape is called M2 code, the addition of 100% purple uwi tape is called M3 code, and the addition of purple uwi tape of 125% is called M4 code.

Time and Place of Research

This research obtained data by experimenting with making *purple uwi mousse tape*. The experiment was carried out in the Culinary Arts laboratory of the Academy of Social Welfare, Ibu Kartini Semarang, located at Jalan Sultan Agung, number 77 Semarang. The time used is 3 (three) months, from March to May 2024.

Tools and Materials

The equipment used to make purple uwi tape mousse includes digital scales, saucepans, measuring cups, spoons, Bowls, strainers, Hand mixers, spatulas, bamboo baskets, steamers, and pudding moulds.

The ingredients used in making good quality purple uwi tape mousse produce quality products that are constant in taste, color, aroma, and texture. The specifications of the materials used are detailed in Table 1 as follows:

Table 1 Specification of Materials for Making *Purple Uwi Tape* Mousse

Ingredient Name	Characteristic	Brand/ Type
Purple uwi tape	Dark purple, sweet and slightly sour, wet and soft texture, with a typical fermented aroma. Dressing for *mousse* in a delicate state.	-
Coconut milk	Yellow-skinned coconut, one grated coconut for 500 ml of coconut milk. Coconut milk is milky white, tastes bland, coconut aroma.	Kelapa berkulit kuning
Gelatin	Small crystal-shaped, light brown and odourless	Knox
Yolk	Pure yellow, whole round shape.	Ayam Negri
Cornstarch	White and finely textured, odourless, and tasteless.	Maizenaku
Flour	Medium protein is yellowish-white, finely textured, not musty, and tasteless.	Segitiga Biru
Whipping cream	Smooth texture, white in color, sweet in taste, and with a distinctive milky smell.	Haan
Salt	Fine crystal shape, white color, clean of impurities	Dolphin
Sugar	Medium crystalline texture, pure white, sweet taste, not clumping.	Gulaku
Ice water	Clear, tasteless, colorless, odourless, temperature four °C	Aqua

Source: Author's Primary Data (2024)

Method

Making purple uwi mousse begins with making purple uwi tape first, then continues with uwi ingu mousse. The steps are described as follows:

Steps to Make Purple Uwi Tape

In making purple uwi tape, the author refers to the stage of making cassava tape, which was written by Hidayat (2017). The stages of making purple uwi tape can be seen in Figure 1 of the following flow diagram:

FLOW CHART FOR MAKING PURPLE UWI TAPE

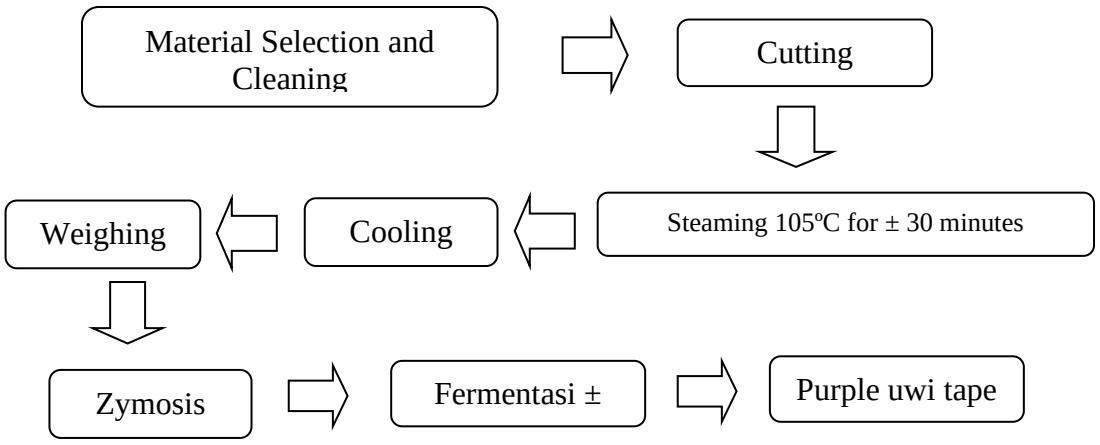

Figure 1 Tape Manufacturing Flow

Source: Author's Primary Data (2024)

Based on Figure 1, the processing steps can be described as follows:

1. Choose fresh but non-gummy purple uwi (at least three days from harvest time), peel with a thickness of 0.5 cm from the outer skin, and clean the purple uwi by washing it on a clean and flowing.
2. Cut purple uwi as many as six pieces of size @ ± 400 g, into four pieces
3. Steaming the purple uwi for 45 minutes at a temperature of 105 ^{oc}
4. The cooling of the steamed purple uwi reaches room temperature.
5. Penimbangan uwi ungu kukus sebanyak 1000 g.
6. Steamed purple uwi: Arrange the st,eamed purple uwi weighed on banana leaves arranged in a bamboo basket, sprinkled with fine tape yeast evenly, and then covered with banana leaves.
7. Fermentation, the curing/fermentation process ± 48 hours, at room temperature; the finished tape has a typical fresh sour smell, the texture is soft and slightly moist, purple in color, and has a sweet taste with a slightly sour taste.

Steps to Make *Purple Uwi Tape* Mousse

The manufacture of purple uwi tape mousse goes through several stages that must be done carefully and precisely. In addition, hygiene and sanitation must be paid attention to. The application of these things aims to obtain quality products so that they are suitable for consumption. Furthermore, each experiment is explained by the formula as shown in table 2 as follows:

Table 2 Uwi *Ungu* Tape Mousse Formula,

Material	M1 (50 %)	M2 (75 %)	M3 (100 %)	M4 (125 %)
Ice wate	200 ml	200 ml	200 ml	200 ml
Thick coconut milk	50 ml	50 ml	50 ml	50 ml
Purple uwi Tape	100 g	150 g	200 g	250 g
Sugar	135 g	135 g	135 g	135 g
Salt	5 g	5 g	5 g	5 g
Cornstarch	25 g	25 g	25 g	25 g

Flour	20 g	20 g	20 g	20 g
Yolk	2 butir	2 butir	2 butir	2 butir
Gelatin	4 sdm	4 sdm	4 sdm	4 sdm
Whipping cream	500 g	500 g	500 g	500 g

Source: Author's Primary Data (2024)

The process of making purple uwi mousse tape is illustrated with a chart and can be observed in Figure 2 as follows:

FLOW CHART FOR MAKING *PURPLE UWI TAPE* MOUSSE

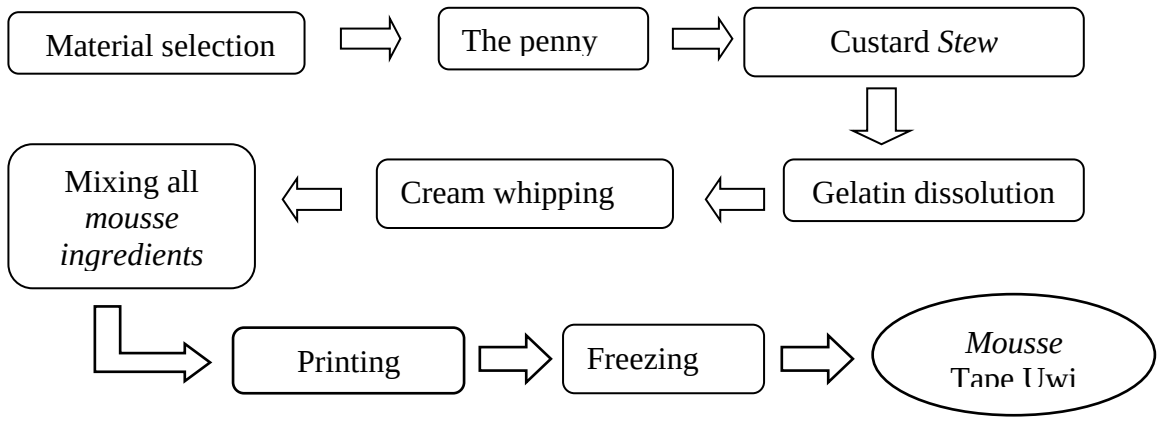

Figure 2 Flow of the process of making *purple Uwi* Mousse Tape

Source: Author's Primary Data (2024)

The flow of making *purple uwi tape mousse* in Figure 2 is described as follows:

1. The selection of materials used is based on the criteria in Table 1.
2. Weighing materials are adjusted to the needs in Table 1.
3. Custard boiling: Dissolve wheat flour + cornstarch + sugar + salt + egg yolk, and 450 ml of thick coconut milk until evenly distributed. Then boil over medium heat until thickened and boiling, stirring slowly so that it does not crust. Lifted from the fireplace, then cooled to a temperature of 30°C.
4. Dissolve the gelatin with 50 ml of coconut milk, then heat it by steaming it for 5 minutes while stirring until dissolved. Lifted from the fireplace and cooled to 40°C
5. Whipping *the whipping cream* with ice water until stiff.
6. Making *mousse*: Mix whipped cream, custard, and gelatin until evenly mixed. It has a soft texture like *foam*.
7. Printing *purple uwi tape* mousse dough on *a pudding mould* with a capacity of 100 ml.
8. Freeze *purple uwi tape* mousse dough in the *freezer* (temperature below 0OC) for ±24 hours. After the purple uwi *tape mousse* is frozen, it will be served and enjoyed.

Data Analysis

The method of analysing the collected data using qualitative analysis to describe the results of experiments quantitatively, namely to find out the level of public preference using average analysis (Rahayu, 2001). The questionnaire is an efficient data collection technique if the researcher knows exactly what variables to measure or what respondents cannot expect. A questionnaire is a technique for collecting large amounts of data (Sugiyono, 2016).

This Questionnaire method is included in the hedonic test used to obtain the panellists' preference level for *the Purple Uwi* Mousse Tape*.* The questionnaire uses the criteria of immensely dislike, dislike, neutral, like, and very like. The criteria are given a score of 1 for very disliked, a score of 2 for dislike, a score of 3 for neutral, a score of 4 for liking and a score of 5 for liking very much. The score of each experimental product is then calculated as a percentage in the form of a bar chart. The nutritional assessment for manual analysis is calculated using the Indonesia Food Composition Table (TKPI) guide.

3. Result and Discussion

Sensory Assessment

Sensory or organoleptic testing is a test that is based on the sensory process. Sensing is defined as a physiology, namely awareness or recognition of the properties of these objects. The reaction or impression caused by the presence of a stimulus can be in the form of an attitude to approach or pamper, like, or dislike the different causes of the stimulus Darma, (2013) in (Fitriana, 2021).

To get suitable characteristics, the organoleptic analysis of purple uwi tape mousse is carried out by observing taste, color, texture, and aroma. The *mousse* criteria used in this study refer to the mousse written by Farida (2008). The criteria for the resulting *mousse* are a soft and foamy texture, a sweet and savoury taste that is just right, and a milky and yellowish-white product produced from *cream* and egg yolks. Furthermore, the results of the assessment on the purple uwi *tape mousse* are adjusted to the raw materials used, explained in the following Table 3:

Table 3 Features Mousse Type Uwi Ungu,

Product Code	Criterion			
	Taste	**Flavor**	**Texture**	**Color**
M1 	Sweet, savoury, slightly sour	Coconut milk and a little milk and a little tape	Soft and *creamy* yet dense	Bright pink
M2 	Sweet, savoury, slightly sour	Coconut milk and a little milk and tape	Soft and *creamy*	Bright purplish pink

M3 	Sweet, savoury sour	Coconut milk and a little milk and tape are more flavorful	Soft and *creamy*, slightly fibrous	The pink is quite intense
M4 	Sweet, sour, savory	Coconut milk and the sharp aroma of tape	Soft, *creamy*, and fibrous	Darker purplish pink

Source: Author's Primary Data (2024)

Based on the explanation in Table 3, the assessment of the sensor on *the purple uwi tape mousse* is described as follows:

Taste

The taste of *purple uwi tape mousse* has a sweet taste that is inspired by the use of sugar and *whipping cream* and is savoury, which is influenced by the use of salt, coconut milk and egg yolk, as well as fresh acidity, but with a different acidity from the four products. The more purple uwi tape is added, the higher the acidity level. Although the use of purple uwi tape is different, it does not affect the different levels of sweetness because the purple uwi tape has a slightly sour sweetness produced from the fermentation of the tape.

Flavor

The flavour of *purple uwi tape mousse* is dominated by the aroma of tape, although there is a slight aroma of coconut fusion and a slight smell of milk. Of the four products with different levels of aroma tape or different fermentation, the more purple uwi tape is added, the stronger the aroma of the tape (Guntara et al., 2022). The aroma in the purple uwi tape *mousse*, in addition to being produced from the purple uwi tape, is also produced from the use of coconut milk, which produces a savoury aroma of coconut milk and *whipping cream,* which produces the aroma of milk (Junita et al., 2023).

Texture

Purple uwi tape mousse has a soft and creamy texture but is slightly fibrous. The use of custard dough influences the soft texture because *custard* generally has a thick texture. After all, it uses eggs and cornstarch as thickeners (Fransiska, 2021). The creamy texture is obtained from the use of whipping cream ingredients because whipping cream is the primary source of fat in *mousse,* with a fat content of 18% - 35%, in addition to the fat content in egg yolks (Shoheh et al., 2019), the fat contained in the *mousse* can catch air evenly during the dough beating process, thus making *mousse*

to be soft. Purple uwi tape influences the fibrous texture because purple uwi has coarse fibrous characteristics (insoluble fibres) (Ajid et al., 2022).

Color

The color evaluation of purple uwi tape mousse is pink with a slight purple effect and is characterised by the use of purple uwi tape, which is 125%. The difference in using different purple uwi tape is not too noticeable. Overall, the color of the four dominant products is pink, produced from purple uwi tape, which has a purple color (Anabire, 2021; Yuniawati et al., 2010). The more purple uwi tape is used in the mousse, the color difference is slight; it does not look too different.

Consumer Acceptance Assessment of *Purple Uwi Tape* Mousse

Public acceptance of purple uwi mousse tape is done through a sensory or hedonic test. This test assessed the level of preference for the sensory characteristics of *purple uwi tape mousse*. The sensory characteristics assessed are in the form of taste, texture, aroma and color. The assessment results by the panelists were then measured using the average score of the panelists' preference level on *the purple uwi tape* mousse.

The value of the preference calculation is presented in the form of a gram. The taste calculation diagram can be seen in Figure 15, the texture calculation diagram in Figure 16, the aroma diagram in Figure 17, and the shape calculation diagram in Figure 18. Each image is described as follows:

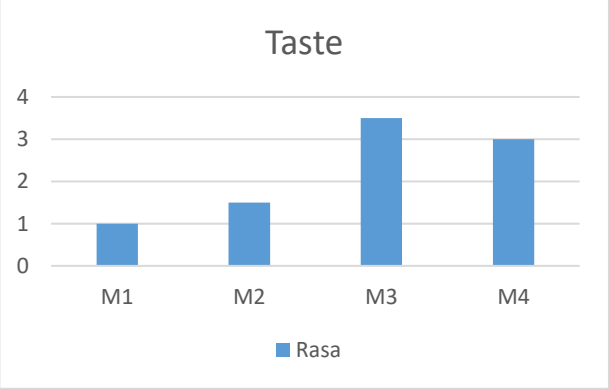

Figure 3 Flavor Bar Diagram on *Purple Uwi* Mousse Tape

Source: Author's Primary Data (2024)

Figure 3 shows the bar diagram for the sensory characteristics of the taste of *purple uwi tape mousse* for code M1 with an average of 1 and code M2 with an average of 1.5. The average M3 code is 3.5, and the average M4 code is 3. From the sensory test results, it can be concluded that the panellists liked adding purple uwi tape as much as 100%, with an average value of 3.5 (very liked) for the M3 code.

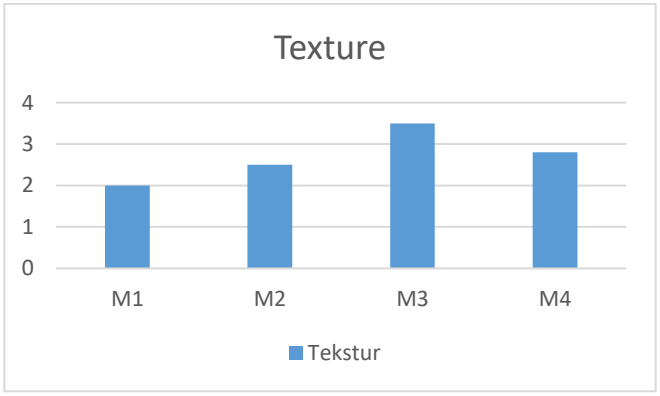

Figure 4 Texture Bar Diagram on *Purple Uwi* Mousse Tape

Source: Author's Primary Data (2024)

Looking at Figure 4, the consumer assessment on the texture, the highest average value shows the purple *uwi tape mousse* product code M3, adding purple uwi tape as much as 100% with an average value of 3.5 (I like it very much). The panellists preferred the product because of its soft, dense and less fibrous texture.

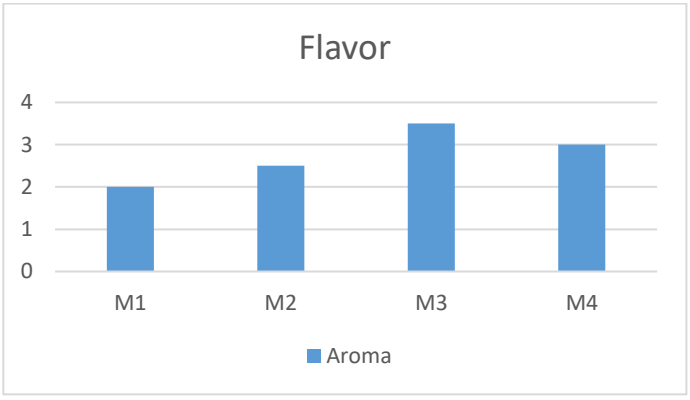

Figure 5 Flavor Bar Diagram on *Purple Uwi Tape* Mousse

Source: Author's Primary Data (2024)

The Figure 5 that the highest average value of sensory characteristics in the form of product aroma is in the product code M3, *mousse* with the addition of purple uwi tape as much as 100% with an average value of 3.5 (I like it very much). The reason why the panellists preferred the product was because of the not-too-sharp smell of the tape; in addition to the not-so-sharp aroma of the tape, *the mousse* product, with the addition of 75% purple uwi tape, produced a bright pink color that was so distinctive, thus producing a distinctive combination between white and purple uwi tape.

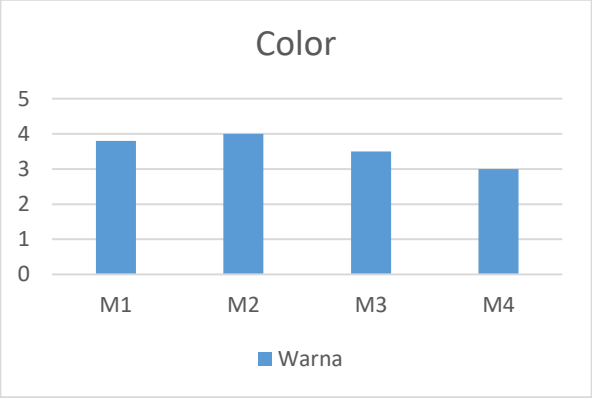

Figure 6. Color Bar Diagram On *Purple Uwi* Mousse Tape

Source: Author's Primary Data (2024)

The assessment of consumer acceptability in the form of color, according to Figure 6, gave the highest average assessment of the color of *the mousse* with the addition of purple uwi tape by 75%., namely the product code M2. The panelists prefer the product because the color is more attractive, namely bright pink; the white color of the *mousse* with the purple color of the purple uwi tape adds to the aesthetics of *the purple uwi tape* mousse.

The results of the overall assessment analysis of the taste, aroma, texture, and color indicators of the product, the panelists chose *a mousse* with the addition of purple uwi tape, with the addition of purple uwi tape as much as 100% of the code M3 from the total weight used excluding water. Therefore, for calculating fibre, protein and flavonoid content, mousse products are used with the addition of 100% purple uwi tape with the code M3.

Nutritional Assessment *of Purple Uwi Tape* Mousse

Nutrition is a chemical element that the body needs to produce energy and maintain, build and repair body tissues (Tranggono, 1990). The nutritional assessment contained in purple uwi *mousse* includes the content of fibre, protein and flavonoids. The nutrition calculation guidelines use the guidelines of the Indonesia Food Composition Table (TKPI) and are calculated manually. *Purple uwi tape mousse,* whose nutritional content is calculated, is the most preferred sample by the panellists, namely with the code M3 with the addition of 100% purple uwi tape. The results of the calculation of the content *of purple uwi mousse*, which includes fibre, protein, fat and flavonoids, are explained in the following Table 4:

Table 4 Nutritional Content of Purple Uwi Tape Mousse

No	Material	Total	Fibre	Carbohydrates	Protein	Flavonoid	Fat
1.	Santan	300 ml	4,2	22,8	6	-	216
2.	Tape uwi ungu	200 g	1,52	244,8	13,72	2,42	1,32
3.	Gula pasir	135 g	-	133	-	-	-
4.	Garam	5 g	-	-	-	-	-
5.	Maizena	25 g	-	1,25	0,075	-	0,025
6.	Tepung terigu	20 g	-	15,2	2	-	-

7.	Kuning telur	2 butir	-	1,4	32,6	-	63,8
8.	*Whipping cream*	25 g	-	0,5	-	-	-
Total			5,72	419	54,4	2,42	281
Per*cup*		10 cup	0,57	41,9	5,44	0,24	28,1

Source: Author's Primary Data (2024)

Table 10 shows that the percentage of fibre content from *mousse* with the addition of purple uwi tape is 100% of the total weight of 5.72 g of total energy, and the protein content of the total weight is 54.4 g of total energy. The nutritional content produced by *mousse* products is very high; this is due to the use of purple uwi *tape mousse* ingredients that have a high carbohydrate content, such as purple uwi tape, thick coconut milk, sugar, cornstarch, and egg yolks. However, for flavonoids produced from purple uwi.

Based on the total nutrient content in Table 8, is the nutrient content of a total of one recipe code M3 product, the finished product of one recipe produces a total weight of 1,165 grams, divided into 10 cups with a cup size of 8 oz/*ounce*; each cup contains 117 grams. So, each cup contains 0.572 grams of fibre, 5.44 grams of protein, 0.242 grams of flavonoids, 41.9 grams of carbohydrates, and 28.1 grams of fat.

4. Conclusion

The best formula is mousse with the addition of purple uwi tape as much as 100% of the total whipping cream, code 312 with 200 ml thick coconut milk, purple uwi tape, sugar 135 g, salt 5 g, cornstarch 25 g, wheat flour 20 g, egg yolk 2 grains, gelatin 5 g, and whipping cream 500 g. The panellists' acceptance of purple uwi tape mousse, based on the results of the hedonic test, showed that the most preferred was the mousse with the addition of 100% purple uwi tape to the M3 code. The characteristics produced from the mousse with the recipe formula are its slightly salty savoury sweetness, a distinctive aroma of tape and milk, a soft texture, and a bright pink color that attracts consumers. The nutritional content of purple uwi tape mousse per cup with a size of 8 oz/ounce (117 g), contains 0.572 g of fibre, 5.44 g of protein, 0.242 g of flavonoids, 41.9 g of carbohydrates, 28.1 g of fat. Suggestions for research using the tape yeast formula in the process of making purple uwi tape: During the fermentation process, please do not open it prematurely because it will inhibit the fermentation process of the tape. Research can be done with other tubers to be mixed with mousse. They are conducting nutritional content tests in food laboratories so that the results are satisfactory and more valid.

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