CHAPTER I

INTRODUCTION

A. Research Background

Nowadays, desserts have always been around since the very beginning of human civilization and it is one of the most beloved food staples for many people. Desserts are a type of sweet food that are eaten at the end of a meal. As time goes by, various innovations and ameliorations have been made by creative and sophisticated pioneers in the culinary industry which inevitably includes the invention of one of the most versatile and essential elements in the culinary world, and that is the invention of *mousse.*

Mousse is one of the most common types of desserts that one can find in recent times. The reason for its widespread utilization is primarily due to its flexibility, meaning that it can be used as a main component in and of itself and it can also be used as a supplementary item as well, which encompasses the base, the aerator and the thickening agent, such as gelatin. *Mousse* can also be defined as a set - apart dessert because of its airy and light texture (Mock, 2024). In addition, there are also various types of *mousse* as well. The bases of making *mousse* typically include *fruit purée,* chocolate, eggs and even savory fillings (Sullivan, 2022).

The word *mousse* originates from the Latin word "*mulsa*" meaning bubbly and its origins can be traced back to the 18th century. However, for the chocolate *mousse,* it was made popular in the 19th century especially by Henri de Toulouse - Lautrec, a prominent French painter and cook (Swiers, 2024). The main components of *mousse* are usually the base, aerator (which can be eggs or cream), sweetener and also the gelling agent.

Based on experience, the most common component that is used as an aerator in making *mousse* is whipping cream both non - dairy and dairy. This is because of its rather simple way of processing and also because of its neutral taste and richness. Whipping cream itself is a form of an aerated emulsion that is made by way of whisking it with at least 35% of fat content in it (Nguyen et al 2015). Even though whipping cream or non - dairy are considered as one of the most essential elements when making *mousse* - based products, they can also be arduous to access for certain people because of certain factors such as its cost and accessibility. These can provide inauspicious situations for certain people because of the aforementioned things.

Therefore, we need to keep in mind crucial factors in buying both non - dairy and dairy whipping cream, such as the shipping cost and production cost. Which is very tangible in that aspect since the components in the artificial cream are not too costly.

However, there is what is known as an artificial cream which can imitate commercial non - dairy whipping cream in its usage. This includes 4 main ingredients, which are : powdered creamer, cold water, icing sugar and lemon juice. Despite this, how can all of these ingredients be used and why should artificial cream be promoted?

Powdered creamer is a delicate addition in certain beverages, such as coffee to reduce its acidity and appeal to a wider range of audience. However, powdered creamer alone will not be able to substitute commercial whipping cream because of its form. That's why, the powdered creamer, alongside with other essential ingredients will be homogenized into one and will bear the term "Artificial Cream". Artificial cream itself, is a food additive that's used in unsweetened cooking and whipping applications and shows an excellent result as an alternative to milk cream (Bisen, 2015). Here, this artificial cream will provide a credible alternative for dairy products mainly by way of its availability and cost fact.

For this section, the author would like to illustrate the cost difference of using 3 different ingredients, and those are artificial cream, non - dairy whipping cream and powdered creamer. With an exact illustration, we will be able to mitigate as well as prove the cost differences in using all of these products, thus making it easier for us to determine which one would be the best fit for what we have in store.

Table 1.1. Cost Of Dark Chocolate Mousse Using Artificial Cream

				DATE :	
NO	**INGREDIENTS**	**QTY**	**UNIT**	**UNIT PRICE (RP)**	**COST (RP)**
1	Dark Chocolate Couverture	225	g	IDR35,475.00	IDR31,927.50
2	Artificial Cream	375	g	IDR3,993.00	IDR10,695.54
3	Sugar	105	g	IDR16,000.00	IDR1,680.00
4	Egg Yolk	100	g	IDR30,000.00	IDR3,000.00
5	Gelatin Powder	4	g	IDR10,000.00	IDR1,142.86
TOTAL					IDR48,445.89

Source : Research Processed Data, 2024

Table 1.2. Cost Of Dark Chocolate Mousse Using Non - Dairy Whipping Cream

				DATE :	
NO	**INGREDIENTS**	**QTY**	**UNIT**	**UNIT PRICE (RP)**	**COST (RP)**
1	Dark Chocolate Couverture	225	g	IDR35,475.00	IDR31,927.50
2	Non Dairy Whipping Cream	375	g	IDR68,000.00	IDR28,114.66
3	Sugar	105	g	IDR16,000.00	IDR1,680.00
4	Egg Yolk	100	g	IDR30,000.00	IDR3,000.00
5	Gelatin Powder	4	g	IDR10,000.00	IDR1,142.86
TOTAL					IDR65,865.02

Source : Research Processed Data, 2024

Table 1.3. Cost Of Dark Chocolate Mousse Using Powdered Whipping Cream

				DATE :	
NO	**INGREDIENTS**	**QTY**	**UNIT**	**UNIT PRICE (RP)**	**COST (RP)**
1	Dark Chocolate Couverture	225	g	IDR35,475.00	IDR31,927.50
2	Powdered Whipping Cream	375	g	IDR35,000.00	IDR65,625.00
3	Sugar	105	g	IDR16,000.00	IDR1,680.00
4	Egg Yolk	100	g	IDR30,000.00	IDR3,000.00
5	Gelatin Powder	4	g	IDR10,000.00	IDR1,142.86
TOTAL					IDR103,375.36

Source : Research Processed Data, 2024

From all the tables above, we are able to see the cost difference of using different products in making the same product. And naturally, we are able to perceive that for the cost factor, this definitely goes to artificial cream which can save up to Rp.17,419,13 in comparison to the non - dairy whipping cream and it can also save up to Rp.54,929,47 if one uses powdered whipping cream.

Therefore, if we extract the conclusion from these tables, it's evident that for the most affordable ingredient, artificial cream provides the best solution and it can also save abundant resources. But still, one lingering question might still appear, what about the ingredients and the accessibility? Knowing that artificial cream uses more than one ingredient, it definitely is a rational question to be demanded, but is it actually that different?

Table 1.4. Time Table Of Realization

TIME TABLE OF REALIZATION		
NO	**INGREDIENT**	**TIME**
1	Artificial Cream	3 - 4 Minutes
2	Non - Dairy Whipping Cream	4 - 5 Minutes
3	Powdered Whipping Cream	5 - 6 Minutes

Source : Research Processed Data, 2024

Seeing the amount of time that is needed to realize all of these products, it is safe to say that even if there's not much difference in the time preparation, artificial cream is still the fastest option in this category, followed by non - dairy whipping cream and powdered whipping cream.

Adding to the point above, the ingredients for artificial cream can be found in the local markets without too much hassle. And for the powdered creamer, the author bought it from Tokopedia, an online shopping platform. And yes, it is true that we can also order non - dairy whipping cream and powdered whipping cream online, so what makes artificial cream extraordinary?

Following up again from the examinations that we have done, most of the ingredients in artificial cream can be stored for a considerable amount of time in comparison to liquid non - dairy or even dairy whipping cream.

And for the powdered whipping cream, while it is true that it might also be able to endure long durations of storage in room temperature, however given the evidences that have been presented above, it is safe to say that it would not be recommended to use powdered whipping cream if one's reasons to make a certain product include cost efficiency.

So although artificial cream in hindsight might require us more effort in order to realize it, it is merely surface level and in actuality, it is much more efficient and not to mention much easier to do based on all of the proofs that are listed above.

When talking about the time, it is true that powdered whipping cream doesn't take that much effort to make and its conservation is also fairly simple. However in its realization and cost, it doesn't provide as many benefits as the other two options that have been presented above. Therefore, powdered whipping cream, although it can be stored in different places that do not require sophisticated skills to do so, might not be a viable option in this instance because of the fact that it lacks the capacity to solve other solutions that can be outlined to replace liquid whipping creams.

Thus in further sections, the author will be discussing only about artificial cream and non - dairy whipping cream and powdered whipping cream will not be taken into further consideration because of all of the aforementioned reasons above.

Other than its cost and time efficiency, this type of artificial cream provides a lot more stability and the ingredients are fairly easy to find and access (Hermawan, 2020). Which is why the author has decided to propel and introduce this form of experimentation as an alternative to replace and substitute commercial whipping creams. Not to mention that it is also a palpable way to use it if one desires to sell their products using artificial cream, which can of course be financially beneficial but also to introduce another supposition that might be able to serve well as an alternative.

Aside from the economic value that can be gained from this experimentation, it also aims to reduce the excessive usage of dairy whipping cream production since it is evident that too much dairy production will exacerbate the health of domestic cows which will in turn lead to a much lower production quality of creams in the future (Barkema et al, 2015).

In making this artificial cream, the recipe that the author will use will come from Chef Devina Hermawan, an eminent celebrity chef from Indonesia who has also published various books about cooking and baking and whose works can be found on multifarious platforms.

All of these will ensure that everything is authentic and tangible in accordance with the procedure of the final project. And for that, the author would like to propose this as the title of his final project as **"THE USAGE OF ARTIFICIAL CREAM IN MAKING DARK CHOCOLATE *MOUSSE*"**.

B. Questions

In this section, the author will lay out all of the questions that come to mind regarding this final project and what can be expected from it :

1. How will the flavor be in using artificial cream as a substitute for commercial non - dairy whipping cream in making dark chocolate *mousse*?
2. How will the appearance be in using artificial cream as a substitute for commercial non - dairy whipping cream in making dark chocolate *mousse*?
3. How will the texture be in using artificial cream as a substitute for commercial non - dairy whipping cream in making dark chocolate *mousse*?

C. Answers

Aside from the questions, there will also be answers that are meant to act as a response that will ultimately infer the results that will be achieved at the very end of this final project, below will be the following answers :

1. Knowing the flavor of artificial cream as a substitute for commercial non - dairy whipping cream in making dark chocolate *mousse*.
2. Knowing the appearance of artificial cream as a substitute for commercial non - dairy whipping cream in making dark chocolate *mousse*.
3. Knowing the texture of artificial cream as a substitute for commercial non - dairy whipping cream in making dark chocolate *mousse*.

D. Research Approach

To carry out this research, the author will be using a method of research which is experimental research. Experimental research or experimental method is a process where a bundle of data manifests theoretical knowledge and understanding (Webster & Sell, 2014).

In conducting this experiment, the author will commence by changing one variable of the end product which is chocolate *mousse* and for the first variable, it will be the commercial non - dairy whipping cream and the other will be the artificial cream. In this instance, the comparison will only just be one, which is 100% artificial cream - 0% commercial non - dairy whipping cream while also taking into account the organoleptic components for the final product.

However, since there are also variables that can be tested in experimenting with the artificial cream, the author will utilize a non - dairy liquid creamer which is a liquid form of the powdered creamer as a substitute for the powdered creamer and vinegar as well as lime juice which will take the place of the lemon juice. This will be done in order to ensure the best possible result for the artificial cream or if there will be any slight adjustments that we should make in order to achieve the best result possible and of course to test out various plausible ersatz.

This final project will also be able to confirm certain hypotheses and verdicts if it can actually be used as a substitute for the main component and if the results align with certain expectations and suppositions. This in turn will be able to give credibility to this experimentation in the future.

E. Research Procedure

When it comes to the research procedure, there will be a handful of things that need to be supervised and also verified in order to guarantee the authenticity of this experiment, those factors will include :

1. Deciding which component in a recipe that will be substituted.
2. Finding out which existing product will be tested in this experiment. In this instance, the author has chosen chocolate *mousse.*
3. Laying out the standard recipe for both the artificial cream and also the actual dark chocolate *mousse* recipe that will be used.
4. Making dark chocolate *mousse* using both the homemade and commercial non - dairy whipping cream during the pre - experimentation stage.
5. Using the homemade or artificial cream recipe (Hermawan, 2020), a well - known Indonesian celebrity chef.
6. The pre - experimentation will be about substituting commercial non - dairy whipping cream with a ratio of 100% artificial cream - 0% commercial whipping cream and other variables such as non - dairy liquid creamer, vinegar and lime juice.
7. Observing and grading the end results that the experimented and existing products will yield.

8. Conducting a hedonic test to untrained volunteers in order to know how the general public will perceive the experimented product.
9. Gathering and collecting data based on the responses that have been conceived.
10. Concluding the end result of this experiment by from the aforementioned responses.

F. Data Collection Method

In order to realize the author's research, it is essential that we are also able to gather data and information that will act as a documentation and that can also serve as references to further support the veracity in this final project :

1. Literature

   As one of the most important things in academic writing, literature will be included and incorporated in this final project with an objective to support, boost and aid each and every information that is present. The references from the authors will also be cited and included from the ones that do possess specific credentials with concrete evidence to back up what they have written.

2. Observation

   According to Cambridge Dictionary, is the act of observing something or someone. Certainly this act is also simple, as it uses basic human senses to gather information in one's ambience.

3. Questionnaire & Panelists

After the experimentation is done, the author will propagate the product's assessment by way of using a form or a questionnaire to everyone that has participated in this experimentation in order to gain their feedback, response and insight regarding the experimented product and also the original product. Therefore, everything will be documented as essential data.

For the panelists or volunteers, the author will choose 25 untrained panelists. Keeping in mind that the untrained panelists will only be able to grade the product, in this instance dark chocolate *mousse* in a general or simplified fashion. The untrained panelists will consist of adult panelists with an equal number of female and male participants. (Agusman, 2013).

The author would also observe and qualify the organoleptic senses in a much more detailed way according to the gustation points that are present. Those of which would include, volume, color, softness, stiffness, flavor and after taste. The panelists however will only review the gustation points in a much more general scope.

G. Data Measurement Method And Analysis Method

A hedonic scale is a measurement tool to scale the liking and preference of a product (Stone, H et al, 2020). The hedonic scale is also a simple tool and has been proven to be effective in its function and it also helps gather data when dealing with abundant respondents. The hedonic scale that will be used will certainly include key organoleptic factors, such as : appearance, taste and texture between the experimented product and the original product.

The organoleptic factors that have been mentioned will also be explained in much more detail in the section below :

1. Appearance

   Appearance is the primary thing that we humans perceive when seeing something and it's the main factor whether we will accept or deny what we are seeing (Tanner 2016). Appearance will usually encompass the visual aspects that we use to identify certain things, such as the shape, the size, the height. However, the first thing that we perceive when it comes to the appearance of food is usually color, which can prompt the customers to either choose the product or gainsay the product.

2. Flavor

   Flavor or gustation is the sensory detection of food on the tongue (Cole & Kramer 2015). Flavor is detected from the tongue and it triggers certain sensations of the tongue, which include sweetness, sourness, bitterness, saltiness and umami. Temperature may also play a role in flavor, since certain senses in the mouth are able to spot it.

3. Texture

Food texture encompasses hardness, smoothness, thickness and other mouth - feel characteristics (Jiang et al, 2014). Food texture is analyzed from the very moment it touches the gustation palate to the aftertaste of a certain product and it is usually utilized to explain the structure of a food.

Since the 20th century, the hedonic scale has still been used and its eminence also has persisted up until now (Stone et al 2020). The traditional nine - point hedonic scale is a viable testing tool and it is evident from the vast amounts of products that have been tested by just using this hedonic scale.

However in this instance, the author will utilize the five - point hedonic as the medium to calculate the score of the experimented and the existing product. The five point hedonic scale provides a much more concise way of extracting and redacting information which will be a much quicker solution and way of processing the data that will be needed.

Below, there will be a five point hedonic scale table that will outline the detail of the process and method of collecting and gathering data :

Table 1.5. Five Point Hedonic Scale

FIVE - POINT HEDONIC SCALE	
PREFERENCES	**SCORE**
Dislike	1
Neither Like	2
Like Slightly	3
Like Moderately	4
Like Very Much	5

Source : Berdos et al, 2020.

In this scale, the author will be able to determine the supposition of the respondents using this scale where the author will conclude the organoleptic test using this hedonic scale between the usage of artificial cream and commercial non - dairy whipping cream in making chocolate *mousse*.

The hedonic test is used of course to scale the acceptance of a certain product that encompasses the opinions and also the verdicts of an individual or a group (Suryono et al, 2018). The author will use a frequency table where the data will be processed into a clear set of table using the interval 1,0 to 5,0 by applying the following equation :

Table 1.6. Interval Scale Equation

$$\text{Interval Scale} = \frac{\text{Highest Value - Lowest Value}}{\text{Number Of Classes}}$$

Source : Research Processed Data, 2024

Table 1.7. Interval Scale Calculation

Interval Scale = (5 - 1) / 5 = 0,8

Source : Research Processed Data, 2024

Applying the results of the interval scale that have been obtained, the author will proceed with the following calculation to determine the preferences of the panelists using the distance of about **0,8** which will be shown in the table below :

Table 1.8. Preference Table

INTERVAL SCALE	DESCRIPTION
1,0 - 1,7	Dislike
1,8 - 2,5	Neither Like
2,6 - 3,3	Like Slightly
3,4 - 4,1	Like Moderately
4,2 - 5,0	Like Very Much

Source : Research Processed Data, 2024

In order to describe and outline the data, the author will apply the usage of descriptive statistics, which is a branch of statistics that processes and analyzes the characteristics of a certain product or products that are being examined (Sulaiman & Kusherdyana, 2016). In doing so, the author must use **the mean formula** to equate the results clearly in the table. Below will be the following **mean formula** :

Table 1.9. The Mean Formula

$$\bar{X} = \frac{\Sigma f\,(x)}{n}$$

Source : Sulaiman & Kusherdyana, 2016

Description :

$\overline{X}$ = Mean / X Bar

Σf (x) = Amount Of Frequency Times Value

n = Amount Of Panelists

Following this, the author will also outline the scheme of the datum by using the frequency table, which will manifest the results objectively and concisely to give a better layout for the audience to read and digest. Said table can be seen in the following page :

Table 1.10. The Frequency Table

PRODUCT	VALUE										Σf (x)	$\bar{x}$
	1		2		3		4		5			
	F	f(x)	F	f(x)	F	f(x)	F	f(x)	F	f(x)		
SOL (EXISTING)												
LUNA (EXPERIMENTED)												

Source : Research Processed Data, 2024

Thus from all of the aforementioned information, the author will be able to show and demonstrate concrete evidence to prove the preferences of all of the panelists that will be a part of this final project in the hopes of making a much more concrete and well established experimentation between the two products.

H. Time And Date

The time and date of this experimentation will be at Rancaherang Street, No.12, Sarijadi, Bandung City, West Java, 40151 with a timespan starting from September 2024 until November 2024. This time span will also include everything that is needed in this final project, such as : literature, documentation, hedonic test and also the conclusion and how this final project can be ameliorated in the future in order to perfect the research that has been done.