IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

ISO 3297:2007 Certified ⁜ Impact Factor 7.12 ⁜ Vol. 9, Issue 11, November 2022

DOI: 10.17148/IARJSET.2022.91111

DEVELOPMENT AND ANALYSIS OF WINTERMELON CHOCOLATE BAR

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Abstract: This study involves the Development and analysis of Winter melon Chocolate Bar. The winter melon filling was prepared using winter melon, sugar, ghee and nuts and the coating was made using chocolate and Choco chips. Three variations were made (1) without using any binder, (2) using maltodextrin as the binder, (3) using starch as the binder. The analysis of winter melon chocolate bar such as the Strength of bar, melting rate, Brix test, pH and test for acidity were analysed. Sensory analysis was conducted to understand the firmness of the filling and the chocolate as a whole. The study concluded that variation (2) provided the perfect firm structure without altering the taste of the product.

Keywords: winter melon, chocolate, maltodextrin, binder

INTRODUCTION

Winter melon is a part of the Cucurbitaceae family and is the most extensively harvested plant. It is also used in a number of cuisines around the globe. Ash gourd offers health benefits but we can make different food items with winter melon such as stew, candies, winter melon soups, cakes, curries, stir-fries, curries, watermelon juice, and most importantly winter melon tea are some of the food items made from it. Not only winter melon but its seeds also used in various medical treatment. Winter Melon is an excellent companion to the weight loss journey as it is a low-calorie vegetable, therefore, they can be added to any diet plan of low calories. As per research, winter melon has some medicinal properties as well and has proven to be an effective natural remedy for curing a number of ailments. They measure about 15 inches in diameter and weigh in more than thirty pounds when fully grown. They are most likely sold in the sliced form because of its massive size.

Winter melons are pistachio colored, hard, chalky with a feel of wax. As the name suggests, these are available majorly in winters. The flesh tastes mild and has a similar texture as that of a watermelon. It has a large cavity for seeds. Winter melon is abundantly laden with nutrition. It has essential minerals and vitamins such as vitamin C, vitamin B1 and B3 and a number of complex vitamins such as riboflavin, niacin, and thiamine. This vegetable is a great source of potassium, phosphorus, iron, magnesium, zinc, copper, selenium, sodium, manganese and calcium. Water covers about 96% content of Winter Melon. It provides healthy carbohydrates, proteins and dietary fiber. Ash gourd is known to boost the health and relieve one from a number of diseases. It helps in maintaining blood pressure levels because of its potassium content. It is an ideal vegetable to be included in the weight loss diet plan. Chocolate has antioxidant properties. Dark chocolate can boost mind's focus. It protects the skin from dehydration. It supports the functions of heart. Dark chocolate lowers blood pressure. Cocoa is rich in good nutrients. It boosts energy levels. Chocolate is important for pregnant women. Coconuts are exotic sweet fruits. Coconut trees are widely grown in tropical regions. They are like an elixir in our daily lives. Every part of the coconut tree can fulfill our daily necessities. Coconut oil, coconut water, milk, coconut flesh, wood for fuel, husk for scrubber, and ropes are some of the many things we get from a coconut tree. Also, coconut is full of cosmetic and medicinal properties. Ghee contains a high concentration of fat it is rich in Omega 3. Omega 3 fatty acids are known to promote cardiovascular health. Studies suggest that people who consumed a spoonful of ghee daily had reduced serum cholesterol levels and a lower incidence of coronary artery disease.

COMPOSITION:

Ingredients	Quantity%
Ash gourd	80
Chocolate	15
Choco chips	5
Ghee	1

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sugar	40
nuts	1.5

Materials

The materials required to perform this task are Ash gourd/winter melon, Chocolate, Choco chips, Ghee, sugar and nuts. The ingredients were purchased from the local market.

METHODOLOGY

Preparation of winter melon chocolate bar

Weigh chocolate & Choco chips, melt both into a smooth texture. In a bowl grate the winter melon and squeeze well until all the water is removed and let it rest. In a pan add ghee, to it add winter melon and allow it to boil until it it is semi cooked now this point add sugar and nuts, stir everything well and allow it to be cooked completely. Once cooked let it rest at room temperature for some time, then place it in the freeze for at least 2-4 hours. Once it was frozen well it is cut into desired shapes and kept aside. Melt chocolate and Choco chips using double boiling and pour the melted chocolate on the frozen winter melon. Let it set for few minutes at room temperature. Then freeze it for at least 5-6 hours so that the filling holds the coating well. Once the chocolate is set well it can be devoured.

Sample preparation for understanding the different variations.

To evaluate the firmness of the filling consistency the samples were treated with 1 tbsp of maltodextrin and 1 tbsp of starch respectively which was incorporated in the winter melon filling in different containers and 3 samples were made (1) without any binder, (2) with maltodextrin as the binder, (3) with starch as the binder and all the (3) variation followed the same procedure but the differentiation were identified with the sensory analysis and the other analysis that were made.

Variation 1	Variation 2 Maltodextrin (1%)	Variation 3 Starch (1%)
1 cup winter melon ½ cup sugar 1 tbsp ghee 1 cup chocolates	1 cup winter melon ½ cup sugar + 1tbsp maltodextrin 1 tbsp ghee 1 cup chocolates	1 cup winter melon ½ cup sugar + 1tsbp starch 1 tbsp ghee 1 cup chocolates

1

2

3

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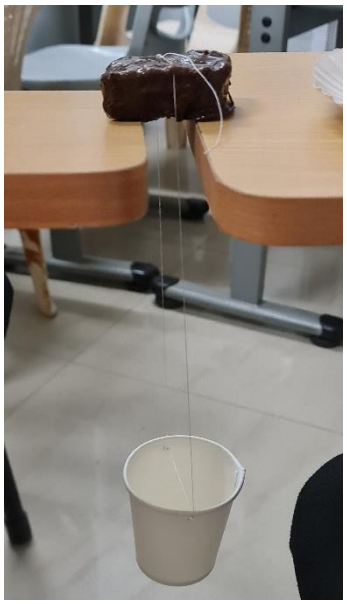
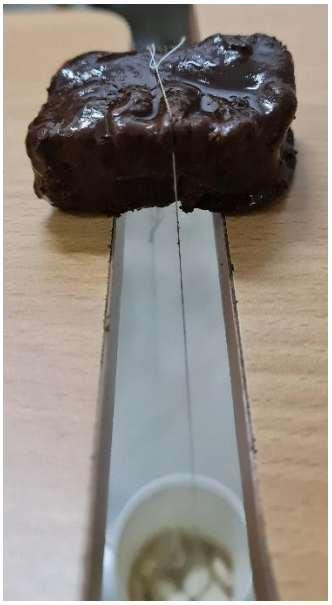
Physicochemical evaluation of prepared samples:

Determination of Strength of chocolate:

Strength test of the sample was done to measure and record the information about the chocolate bar's type (milk chocolate, almond, crisped rice, etc.), width of the bar (mm), w and thickness of the bar (mm), t using

P = (weight of cup, twine, and pennies) *(acceleration due to gravity = 9.81m/s^2). Place the twine with the cup attached across the middle of the chocolate bar so that thecup hangs freely below the chocolate bar. Using the funnel, start placing the pennies into the cup, one at a time. Continue placing pennies into the cup at a steady rate until the chocolate bar fractures. Record the number of pennies in the cup at the time of fracture. Look at the fracture surface and record any observations.





Determination of Melting rate:

If the chocolate has less cocoa, then it will melt faster. Weigh 30 grams of each chocolate type. place 30 grams of each chocolate type into separate paper bowls, Place bowl into microwave and set timer on two minutes and power at 50% start microwave, stir chocolate after 20 seconds being careful not to reset the microwave timer. Place chocolate back into the microwave when chocolate looks mostly melted, remove bowl from microwave stir chocolate and check for consistency If chocolate has completely melted, record time.

Determination of Brix value:

A Brix test essentially measures the amount of solid matter in a liquid sample. brix test gives a good idea of the potential alcohol content. The simplest way to Brix test is to use an optical refractometer, which is portable, easy to use, and gives you a reading quickly. A few drops of juice are placed on a prism and a Brix measurement is obtained.

Determination of pH

The pH of the samples was estimated by the method of AOAC depicted by Horwitz by using pH meter at room temperature (28±2°C). The decision of the pH was made by setting up a buffer at pH 7.0 and the temperature was set to 28°C. pH meter is brought to neutral 7 using buffer and the tip washed with double distilled water. the pH is brought to 4 using buffer and the tip is washed with double distilled water. The tip is then immersed in the sample (ice cream) and the pH is noted.

Determination of total acidity:

The acid content of the must is determined by titrating a sample (a given volume) with a base such as sodium hydroxide solution to a phenolphthalein end point or alternatively, to a pH of 8.2. The titratable acidity is expressed as grams of tartaric acid per 100 ml.

TA as tartaric acid (g/100 ml) = (Titre value of NaOH x Normality of NaOH x Equivalent weight of the acid x 100)/ Sample volume x 1000

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Sensory Analysis:

Sensory analysis is been done with 20 people of general panellists using subjective scoring sheet, where the general panellists done the sensory test on the product on the parameters of appearance, texture, aroma, odour, taste and filling consistency of the developed product of all three variations.

RESULT

Strength test:

P = (weight of cup, twine, and pennies) *(acceleration due to gravity = 9.81m/s^2)

VARIATIONS	RESULT (m/s^2)
1	439.6
2	484.8
3	486.2

Determination of Melting rate:

VARIATIONS	RESULT (at 180˚)
1	15 mins
2	16 mins
3	18 mins

Determination of Brix value:

VARIATIONS	RESULT
1	45˚
2	47˚
3	76˚

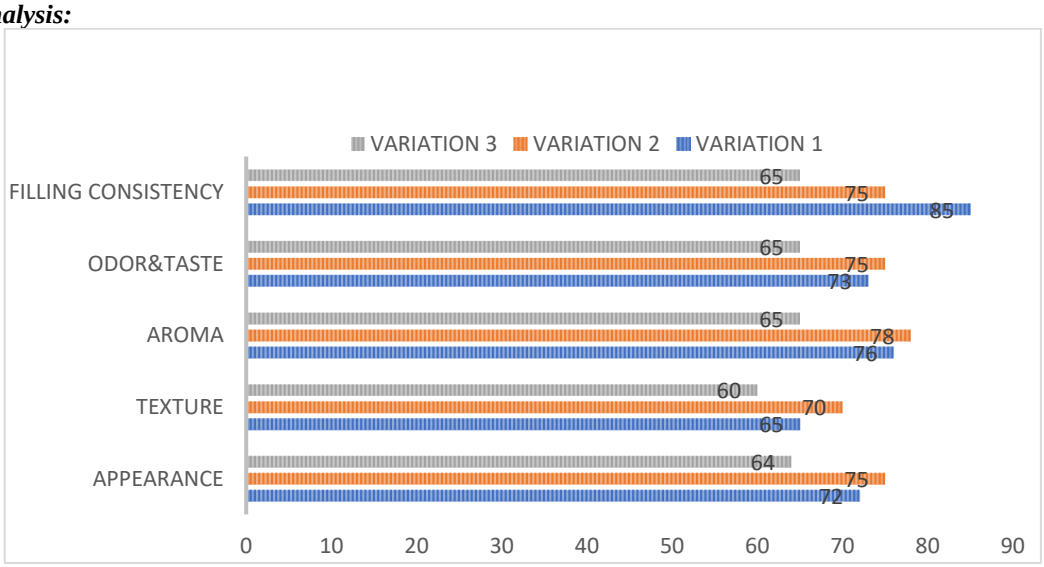
Determination of pH:

VARIATIONS	RESULT
1	6.8
2	6.8
3	7.0

Determination of total acidity:

VARIATIONS	RESULT (g/1000ml)
1	2.17
2	2.20
3	2.20

Sensory analysis:



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The sensory analysis concluded that Variation 2 is found to be more preferred over the other two variations from the analysis satisfying the parameters. Variation 2 is developed with maltodextrin as the binding agent

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