

Preparation and characterization of Stuffed Chocolates : Lowering the risk of heart disease

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Abstract :

A growth of chocolate industry over the last decade has been driven in large part by an increasing awareness of the health benefits of chocolate, specially the dark chocolate. And when it is stuffed with different nuts as well as with dates then it is icing on the cake. Our innovative product consists of dark chocolate, cashew nut, almond, groundnut and dates as a stuffing of chocolate. Iron deficiency is the most common nutritional deficiency in humans and cardiovascular diseases are greater risk. So even being a chocolate product, it serves a health efficient benefits. Consuming dark chocolate can improve several important risk factor for heart disease.

Keywords: *dark chocolate, dates, nuts, stuffed chocolate, cardiovascular disease etc.*

Introduction:

Stuffed dark chocolate is prepared using dark chocolate as a main ingredient. Dark chocolate is rich in iron also contains antioxidant such as polyphenols (procynidine, catechin, epicatechin) and is relatively low in sugar. It has reputation as a healthier alternative to other types of chocolate. In controlled trail, cocoa powder was found to significantly decrease oxidized LDL cholesterol in humans. It also increases HDL and lowers total LDL cholesterol. It contains an abundance of powerful antioxidant that do make it into the bloodstream and protect lipoprotein against oxidative damage.

Materials and method

The various ingredients used in the production of Stuffed Dark Chocolate are dark chocolate, dates, nuts, i.e. cashew nuts, almonds, peanuts, rice balls, choco flakes. The major ingredients used were dark chocolate (60/100g) and dates (14/100g) whereas nuts rice balls and choco flakes were used in minor amounts, with the total weight of each stuffed dark chocolate being 20g.

All the ingredients for the production were purchased from the nearby local market.

The analysis of stuffed dark chocolate for cholesterol and fat was given to test at 'Food Hygiene and Health Laboratory Hadapsar, Pune while the analysis for carbohydrate, protein, calcium, iron, microbial i.e. TPC and *E.coli* was carried out by the group members at MIT College of Food Technology, Pune.

Processing methods and preparation of stuffed dark chocolate

Primary preparation

- 1) Roasting of peanuts to enhance nutty flavour (70- 80°C for 5- 10 mins)
- 2) De seeding the dates
- 3) Crushing the nuts
- 4) Melting of dark chocolate

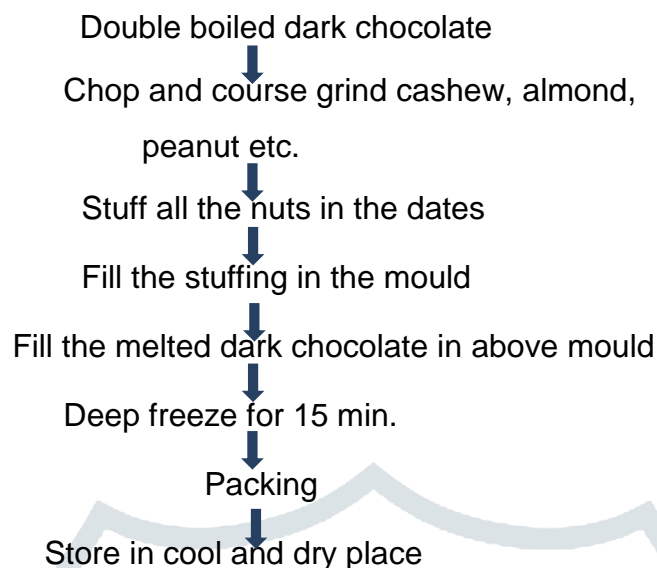
Secondary Preparation

- 1) Preparation of stuffing using dates, crushed nuts, riceballs, choco flakes
- 2) Pouring melted dark chocolate into moulds
- 3) Placing stuffing in the chocolate poured moulds
- 4) Final filling of moulds with melted dark chocolate
- 5) Freeze in freezer (15 mins)
- 6) Pack the product with primary packaging of aluminium foil and secondary packaging of plastic container or cardboard boxes.

Details

- ✓ The melting of dark chocolate should be done by double boiling method.
- ✓ Tapping is required before carrying out process of freezing to prevent trapping of any air bubbles in the moulds.
- ✓ The freezing temperature should be 0 to -5°C.

Methodology



Formulation

Ingredients	Quantity/100gm
Dark Chocolate	60
Dates	14
Peanuts	11.2
Cashew	4.6
Almond	4.6
Choco flakes	3.2
Rice flakes	2.4
Total	100gm

Trials taken and Problems Faced

We prepared five samples of product i.e S1, S2, S3, S4, S5

S1-It contains both dark and white chocolate

Problem- The combination white chocolate along with dates added too much sweetness to the product which lead to the rejection of the formulation and sample

S2-It contains waffle balls covered with dark chocolate

Problem- After a certain period of time the waffle balls losses its crunch making the product part soggy in texture imparting a bad mouth feel, this resulted in rejection of this sample.

S3-It contains jam in stuffing with dark chocolate

Problem- The jam along with the dates added too much sweetness to the product and also imparted an unpleasant texture and mouth feel. Due to these reasons this sample was rejected.

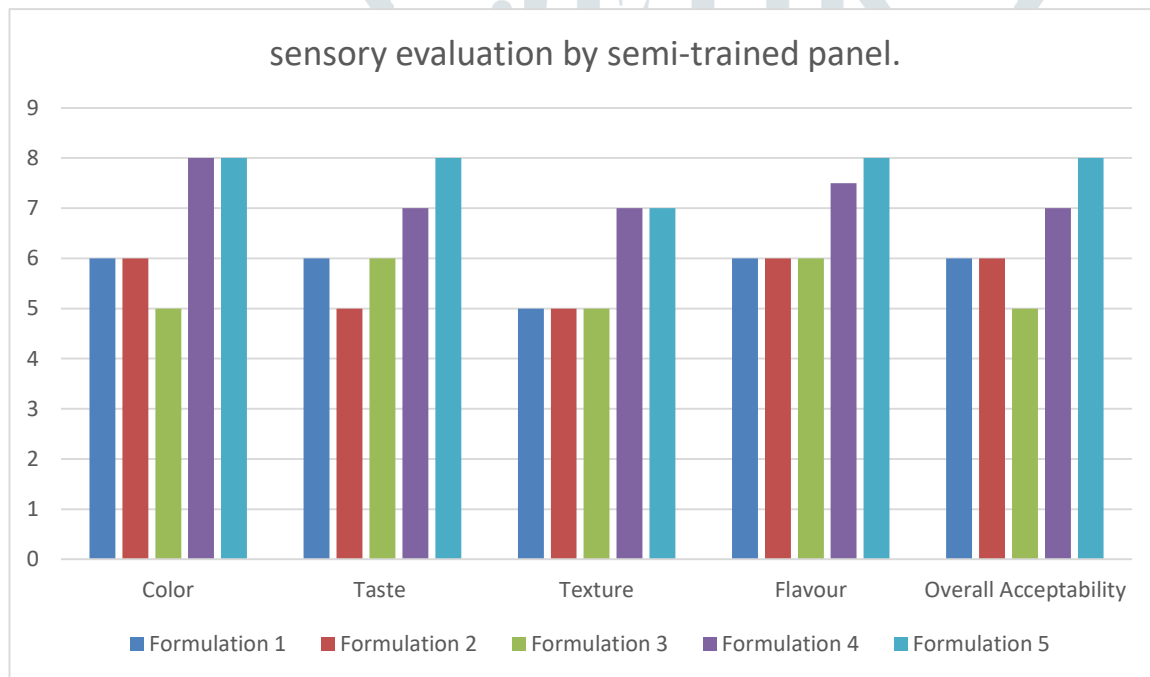
S4-It contain caramel in stuffing with dark chocolate

Problem- On freezing the caramel hardens which causes the product to have a brittle texture making it difficult to chew.

S5-It contain dark chocolate with stuffing

According to the sensory evaluation S5 was the most liked product in terms of colour, flavour, texture and overall acceptability.

Sensory evaluation



Nutritional Analysis

Test	Value (per 100 gm.)	Method
Calories	433.16 kcal.	By calculation
Carbohydrate	55g	By difference method
Fat	28.96g	FSSAI manual for oil and fat
a)Total saturated fatty acids	26.0856g	
b)Total mono unsaturated fatty acids	1.9134g	
c)Total poly unsaturated fatty acids	0.9092g	
d)Trans fatty acids	0.0528g	
Protein	3.4g	Micro-Kjeldahl
Ash	08.20 gm.	By muffle furnace
Moisture	4.2%	Hot air oven
Calcium	80mg	Titration
Iron	98.96mg	Colorimetric
Cholesterol	0.01g	AOAC 994.10

Result and Discussion

From the above given formulation and nutritional analysis table it is interesting to see that dark chocolate along with dates and nuts provides a good bitter sweet taste and mouth feel while the nuts and rice balls and choco flakes add a little crunch factor to the product.

The products shelf life is up to 3 months when stored properly in cool and dry place.

Conclusion

It is evident from the ongoing discussion that ' Stuffed Dark Chocolates' can be prepared by using dark chocolate, dates, nuts (i.e. almonds, cashews, peanuts), choco flakes and rice flakes with a shelf life of 3 months when stored in cool and dry place.

The ingredients used such as dark chocolate and dates, acts as an excellent source to prevent cardio vascular diseases and contains many other health beneficial properties.

The product consists of a primary and secondary packaging material of aluminium foil wrappers and plastic/card board boxes respectively which helps to keep the product chemically and microbiologically safe and stable during the entire storage.

References

- Aune, D; Keum, N; Giovannucci, E; Fadnes, LT; Boffetta, P; Greenwood, DC; Tonstad, S; Vatten, LJ; Riboli, E; Norat, T (5 December 2016). "Nut consumption and risk of cardiovascular disease, total cancer, all-cause and cause-specific mortality: a systematic review and dose-response meta-analysis of prospective studies".
- Cocoa, chocolate and cardiovascular disease by M Galleano - 2009
- Dark Chocolate Prevents Heart Disease
- "Dark Chocolate Is Healthy Chocolate". WebMD. Retrieved 15 March 2016 By Caroline Wilbert
- Food Packaging- Suitable Materials For Presenting Chocolate, Biscuits & Confectionery.By Alex Cospes February 05,2017
- "Preference for dark chocolate continues". Retrieved 15 March 2016.
- The emerging role of flavonoid-rich cocoa and chocolate in cardiovascular health and disease. Engler MB, Engler MM. Nutr Rev. 2006 Mar; 64(3):109-18.
- The Impact of Cocoa Flavanols on Cardiovascular Health. Vlachoianis J, Erne P, Zimmermann B, Chrubasik-Hausmann S. Phytother Res. 2016 Oct; 30(10):1641-1657.Epub 2016 Jul 1.