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Formulation of Vitamins "A Rich Carrot Muffins"

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Abstract: ***The present work deals with the study formulation of muffins enrich with vitamin A. because vitamins A improve the vision prevent the cardiovascular disease and protect against the cancer. Vitamin A deficiency is highly found in kids so the vitamin A is formulate in Muffins, because bakery products is highly consumed in kids. Various proportion is used for the preparation of standardized formulation such as refined flour, corn flour and grated carrot and other basic ingredients required for muffins formulation. Sensory analysis is conducted by semi trained panel using 9 point hedonic scale method and gaining highest acceptability sample is selected for further formulation and chemical analysis. The chemical of carrot muffins was analyzed and it was found that contains Energy value 384 kcl/100gm, protein 4.03, carbohydrate 62.38, total sugar 20.87, fat 13.15 and vitamin A 2923.29IU/100gm.***

Keywords: Grated carrot, composition, Formulation, Vitamin A

1. Introduction

Muffins are a type of sweet or savory bread, baked in small portion that usually look like small cakes or cupcakes but muffins are less sweeter in comparison to cupcakes.[9] Cake batter is a complex emulsion and foam system. Flour, milk, fats, milk, eggs, sugar and the leavening agents are the main ingredient used in the elaboration; each ingredient has an important function in cake structure [1-7]

Carrot is a root vegetable it belongs to *Apiaceae* family and botanical name *Daucuscarota* and Genus *Daucus*. Carrot is globally important vegetable crop that provides essential bioactive constituents such as carotenoids, anthocynins and other phenolic compounds. Carrot is do not supply important sources of calories in human diet but provide significant dietary fiber and nutrients in the form of phytochemicals such as carotenoids, anthocynins and other phenolic compounds. Carrot supply significant amount of dietary vitamin A intake through α-and β carotene. The B vitamins including thiamin, riboflavin, niacin, pantothenic acid, folate and vitamin B6 are found in carrot in appreciable quantities when compared with other commonly consume vegetables. Due to the presence of these compounds carrot is considered as a functional food with potential health benefits for human. Carotenoids are well known as important micronutrients for human health due to their antioxidant properties. Frequent consumption of carotenoids is proven to have protective effect against cancer, cardiovascular diseases, cataract formation and age related mascular degeneration.[5]

Corn, commonly known as maize (Zea mays L.) is annual crop that belongs to the family of grass i.e. poaceae. Maize is also recognized by different synonymes such as zea, corn, silk corn etc. in Hindi it is called as Makka and Bara jovar. Maize is mother grain of Americans and is considered as the earliest cultivar of the new world. It is most widely distributed worlds plant. Maize is a crop having short life cycle and requires warm weather. maize provides many health benefits due to the presence of quality nutrients like rich source of vitamins A,B,E and many minerals .its high fiber content ensures that it plays a significant role in the prevention of digestiveailements like constipation and hemorrhoids as well as colorectal cancer[4].Cardamom seeds have pleasant aroma and a characteristics pungent taste. They are used as a spice and in medicine. They are the common ingredient of curry powder, cakes and other bakery products and sweet breads. They are also used for flavoring liquors[7].

Most important function of eggs is to provide structure to the cake it provide moisture to the cake. It improves the taste and nutritive value of the cake. Eggs used in excess amount will gives abnormal volumes to the cake crust will be dark thick and peeled off as flake. Texture will be dry and rough due to evaporation of moisture. Egg white has characteristics property of good foam formation.[6] Therefore in this study muffins were prepared enrich by vitamin A and dietary fiber coming from cereals, vegetables sources. Nutritional physical and sensory evaluation of these muffins is also carried out.

2. Material and Method

Raw material

The ingredient use for making muffins such as wheat flour, corn flour, sugar, eggs, baking soda, baking powder, carrot, tutifutti and butter was purchase in local market. Then butter and eggs is stored in refrigerated temperature until there use. Now processing the raw material such as corn flour, wheat flour, baking soda, baking powder, cardamom powder is sieved to removed suspended impurities and the the carrot is peeled by hand peeler and then peeled carrot is slice by using slicer. Butter is heated at 60 to 70°c for 15 to 20 seconds.

Preparation of Muffins

Muffins are prepared by taking a appropriate proportion of ingredient. The good quality of raw material is used i.e. it was free from suspended impurities and microbial load. After that all the dry ingredients is sieved because the presence of foreign particles in the material is removed. Then take a large bowl and added all dry ingredients such as wheat flour, corn flour, baking soda, baking powder, cardamom powder and salt and properly mixed. Then same procedure wet ingredients (melted butter, eggs, grated carrot) taking appropriate proportion and those ingredients

simultaneously mix into mixing bowl. Mixing direction is fixed (clockwise or anticlockwise). After that the proper mixing added a white rose essence and mixed. After that the batter is poured in muffins mold and finally muffins is baked at baking oven (oven is preheated at 180°C for 18 minute) then muffins mold are put up the oven and baked at 180°C for 18 minutes. After the baking dark brown color is obtained on muffins. Then muffin is cool and were weighed and packed in plastic bags or plastic LDPE box and stored at ambient temperature or refrigerated temperature.

Preparation flowchart of Muffins

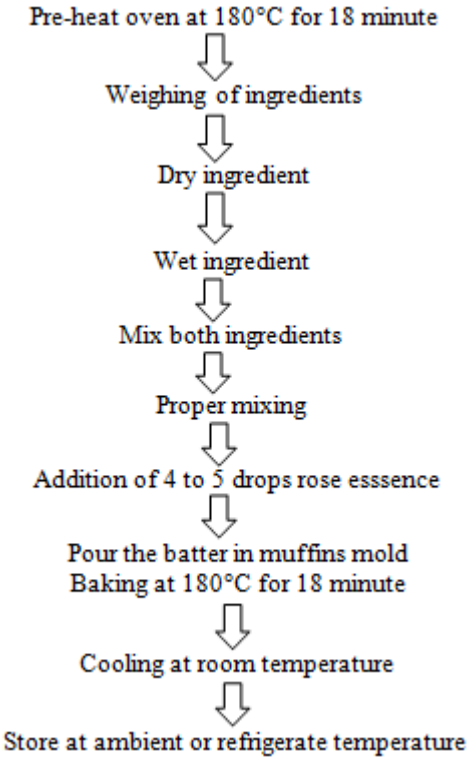


Table 1: Standardized incorporated ratio of vitamins A rich Carrot muffins, For 1 kg

Sr.No.	Ingredients	Quantity (gm)
1	Refined flour	200
2	Corn flour	40
3	Sugar	180
4	Butter	140
5	Eggs	2
6	Grated carrot	100
7	Baking soda	3
8	Baking powder	3
9	Cardamom powder	7
10	Salt	2
11	Tutifutti	20
12	Rose essence	3drps

Various formulation for development of muffins

There was three formulation were made in order to standardize the formulation of the recipe of muffins.

a) Muffins made with the Grated carrot and other basic ingredient.
b) Muffins made with the increase concentration of grated carrot compare with A.
c) Muffins made with the increase the concentration of corn flour and cardamom powder compare with B.

Table 2: Formulation of sample muffins

Ingredients (g)	A	B	C
G.C	180	200	180
C.P	06	06	10
R.W.F	240	400	300
C.F	240	80	180

G.C- Grated Carrot C.P- cardamom powder. R.W.F.- Refined wheat Flour C.F.- Corn Flour

Chemical analysis

Chemical analysis is done by using standard procedure. The estimation of protein was done by kjeldhal method the protein content is obtained by multiplying the nitrogen value with 6.25.[8] for fat estimation the sample is extracted in the soxhlet apparatus for 7 to 8 hrs. using petroleum ether the solvent is evaporated and the residues is weighted.[8] Determination of moisture content is done by using standard oven drying method.[3] Estimation of vitamin A is done by using HPLC method. Energy was calculated by using the formula Energy (Kcal) = (CHOgm%×4)-(total fat%×9)+(protein gm%×4) for factorial method[2]. Estimation of total ash is carried out by using muffle furnace method.[3]

Sensory analysis of vitamin A rich carrot muffins

Sensory evaluation is carried out on the muffins formulations by semi trained panel with the help of 9 point hedonic scale method. The vitamin A rich carrot muffins is prepared with the incorporation of grated carrot, cardamom powder, egg and other basic ingredients. This sample is prepared because the gaining of highest rating on semi trained panel for this sample. A color, texture, taste, flavor and overall acceptability is evaluated by using 9 point hedonic scale method. For the present study is focus on the formulation of high nutrition value of muffins.

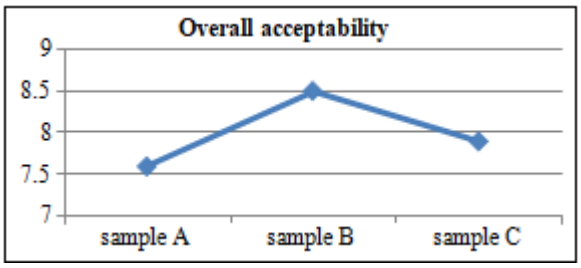
3. Result and Discussion

Sensory evaluation of vitamin A rich Carrot muffins

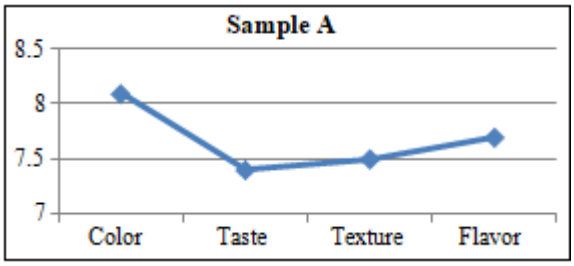
The result is obtained from sensory evaluation of vitamin A rich carrot muffins is incorporated with carrot pieces was influenced by different concentration of basic ingredients and spices. All the formulation is done by using recorded sample B. Because the A sample texture is hard due to high concentration of corn flour. And C sample color is down and also taste is down there for select the B sample. B sample color, taste, texture and flavor is respectively 8.7, 8.4, 8.6 and 8.4. this data is indicate the overall acceptability of muffins is good.

Chemical analysis of vitamin A rich carrot muffins

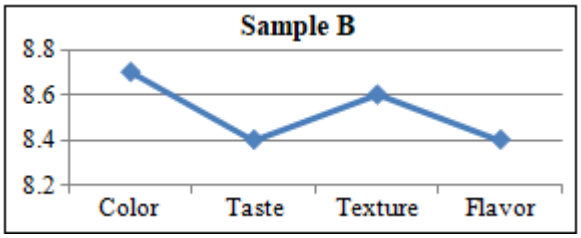
Chemical analysis of vitamin A rich carrot muffins was conducted of sample which is more acceptable in sensory evaluation. i.e. B is shown decrease the concentration of corn flour compare to A. There for texture of muffins is properly set. Product is increase amount of flour, egg, cardamom powder and carrot was given high amount of protein and vitamin A. the higher amount of carrot also increase the amount of vitamin A and dietary fiber.



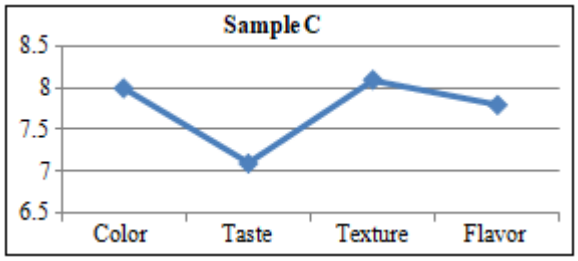
Graph 1: Overall acceptability of samples



Graph 2: Sensory result of sample A



Graph 3: Sensory result of sample B



Graph 4: Sensory result of Sample C

Table 3: Chemical composition of muffins

Sr.No	Parameter	Result	Unit
1	Energy	384	Kcal/100 g
2	Protein	4.03	g/100 g
3	Carbohydrate	62.38	g/100 g
4	Fat	13.15	g/100 g
5	Sugar	20.87	g/100 g
6	Ash	3	%
7	Vitamin A	2923.29	IU/100 g
8	Moisture	18	%

Table 4: Overall Acceptability

Attributes	Sample A	Sample B	Sample C
Color	8.1	8.7	8.0
Taste	7.4	8.4	7.1
Texture	7.5	8.6	8.1
Flavor	7.4	8.4	7.8
Overall acceptability	7.6	8.5	7.9

4. Conclusion

The present study of muffin incorporation with wheat flour, corn flour and grated carrot with appropriate proportion will increase the overall acceptability of final product. Textural characteristics of muffins were affected by increase addition of corn flour, grated carrot, cardamom powder and wheat flour is a good source of energy, dietary fiber, vitamin A and other minerals is special health benefits. Attributes of muffins is increase by the addition of tutti-futti.

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