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Development of Value Added Millet Products by Incorporated With Musa Acuminata

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Abstract: *Muffins are high-calorie baked products distinguished by good taste and texture. In the present study, attempt contain be complete to develop nutrient-rich value added product (muffin) by the incorporation of Musa acuminata in the proportion (65:60, 65:70, 65:80, 65:90, 65:100). The nutritional and mineral composition of muffin and organoleptic properties were analyzed by the standard methods. It discovered that after the substitution of Musa acuminata in value added products the nutritional composition and mineral composition will increase. The organoleptic analysis shows that the incorporation of 80g fresh Musa acuminata was more acceptable in the case of muffins.*

Keywords: *Musa acuminata, muffin, Value added product, waste minimization.*

I. Introduction

The term "banana" is also used as the common name for the plants that produce the fruit. This can extend to other members of the genus *Musa*, such as the scarlet banana (*Musa coccinea*), the pink banana (*Musa velutina*), and the Fe'ibananas. It can also refer to members of the genus *Ensete*, such as the snow banana (*Enseteglaucum*) and the economically important false banana (*Enseteventricosum*). Both genera are in the banana family, Musaceae. A muffin is an individual-sized, baked product. It can refer to two distinct items, a part-raised flatbread and a cupcake-like quick bread. The flatbread is of British or European derivation, and dates from at least the early 18th century, while the quick bread originated in North America during the 19th century. Both are common worldwide today. Quick bread muffins are made with flour, sieved together with bicarbonate of soda as a raising agent. To this is added butter, eggs and any flavorings (fruit, such as blueberries, chocolate or banana; or savories, such as cheese). The mix is turned into a pocketed muffin tray, or into individual paper molds, and baked in an oven. The result is raised, individual quick breads. This product is a flatter disk-shaped, typically unsweetened bread of English or European origin. These muffins are popular in commonwealth countries and the United States. Flatbread muffins are often served toasted for breakfast. They may be served with butter or margarine, and topped with sweet toppings, such as jam or honey, or savory toppings (e.g., round sausage, cooked egg, cheese or bacon). Flatbread muffins are typically eaten as a breakfast food. Banana an edible fruit consumed worldwide has recognition among the public than any other fruit. Bananas have high amount of potassium and has some good quantity of protein and dietary fiber. Potassium helps in muscle contraction and makes the nerves to respond. It also reduces the effect of sodium on blood pressure. Raw bananas contain 75% water, 23% carbohydrates and 1% protein. It supplies 89 calories per 100 gram and provides some amount of vitamin B6, vitamin C, manganese and dietary fiber. Important part is that is has only negligible amount of fat. But this fruit due to fast secretion of ethylene ripens quickly. And also this fruit can't be stored in refrigerator.

II. Materials and Methods

The analysis was performed in the laboratory of Department of Food Technology, Bannari Amman Institute of Technology, Sathaymangalam. Formulation of value added products (muffin) has been done by the substitution of Musa acuminata fruits taken from the local cultivar in Sathyamangalam (Tamil Nadu). All materials have been explained in Table 1 mentioned below.

Nutritional analysis:

The selected whole fruits were analysed for proximate composition. Proximate analysis was analysed in triplicates. Moisture, ash content, protein, and fat were determined by AOAC. Carbohydrates were determined by the anthrone method. Mineral content was estimated by gas chromatography- mass spectrometry.

Table 1: Ingredients used in the preparation of Muffins (in g)

S. no.	Ingredients	C	S1	S2	S3	S4	S5
1	Maida Flour	65	65	65	65	65	65
2	Mashed banana	0	60	70	80	90	100
3	Powdered sugar	65	65	65	65	65	65
4	Baking powder	1.25	1.25	1.25	1.25	1.25	1.25
5	Skimmed milk	16	16	16	16	16	16
6	Salt	0.5	0.5	0.5	0.5	0.5	0.5
7	Baking soda	1.25	1.25	1.25	1.25	1.25	1.25

C Standard=100% Maida flour Muffins,
S1=60g *Musa acuminata*, S2=70g *Musa acuminata*,
S3=80g *Musa acuminate,* S4=90g *Musa acuminate,*
S5=100g *Musa acuminate,*

III. Result and Discussion

Table 3 showed that the mineral composition of a muffin made from maida flour substituted with *Musa acuminata.* The calcium content of muffin ranged from 140.2% to 146.2%. The iron content ranged from 9.58% to 9.69%. Table 2 showed that the nutritional composition of muffin made from maida flour substituted with *Musa acuminata*. The moisture content ranged from 14.1% to 18.5%. The ash content ranged from 0.25% to 0.40%. The carbohydrates content ranged from 50.3% to 66.2%. The protein content ranged from 6.32% to 7.8%.

Table 2: Muffin‑nutritional composition

Drying method	C	S1	S2	S3	S4	S5
Moisture (%)	14.1±0.05	17±0.2	18.3±0.5	18.2±0.05	18.9±0.1	18.5±0.04
Ash (%)	0.25±0.1	0.28±0.12	0.29±0.02	0.32±0.04	0.35±0.1	0.40±0.4
Carbohydrates (g/100 g)	50.3±0.06	52.0±0.04	55.2±0.08	57.2±0.02	60.2±0.1	66.2±0.01
Protein (%)	6.32±0.0	6.46±0.01	6.52±0.08	6.59±0.01	7.1±0.03	7.8±0.01
Fat (%)	12±0.11	12.4±0.1	12.89±0.04	13.51±0.09	13.98±0.01	14.26±0.1

Table 3: Mineral composition

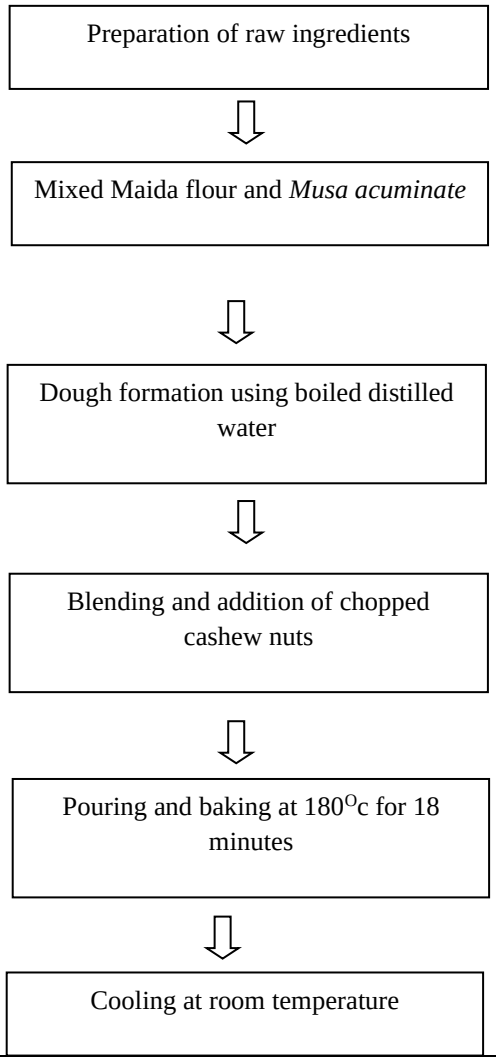
Drying method	C	S1	S2	S3	S4	S5
Calcium (mg/100 g)	140.2±0.1	143.2±0.4	143.9±0.2	144.1±0.2	144.2±0.0	146.2±0.1
Iron (mg/100 g)	9.58±0.02	9.59±0.1	9.60±0.08	9.60±0.1	9.64±0.1	9.69±0.1

Table 4 showed the sensory score of a muffin made from maida flour substituted with *Musa acuminata.* In this study, the results of the appearance, color, texture, flavor, and overall acceptability showed that there was minimum difference between the muffin made from flour blends with *Musa acuminate* and maida flour. The maximum score for Overall acceptability was observed in S3 (7.7), S4 (7.7) and minimum in S2 (7.3). The maximum score for Apperance was observed in S3 (7.6), S4 (7.6) and minimum in S2 (7.3). The maximum score for Color was observed in S5 (7.6), S4 (7.4) and minimum in S1 (7.1). The maximum score for Texture was observed in S3 (7.6), S4 (7.6) and minimum in S2 (7.3). The maximum score for Color was observed in S3 (7.7), S1 (7.5) and minimum in S1 (7.1).

Table 4: Organoleptic evaluation for muffin

Drying method	C	S1	S2	S3	S4	S5
Appearance	7.3±0.31	7.6±0.51	7.3±0.48	7.6±0.51	7.7±0.48	7.4±0.51
Color	7.2±0.42	7.1±0.56	7.3±0.51	7.4±0.51	7.4±0.51	7.6±0.51
Texture	7.3±0.48	7.5±0.52	7.5±0.52	7.7±0.48	7.4±0.51	7.4±0.51
Flavor	7.3±0.42	7.6±0.51	7.4±0.51	7.5±0.52	7.6±0.51	7.3±0.48
Overall acceptability	7.2±0.48	7.4±0.51	7.3±0.51	7.7±0.48	7.7±0.48	7.5±0.52

Muffin development:



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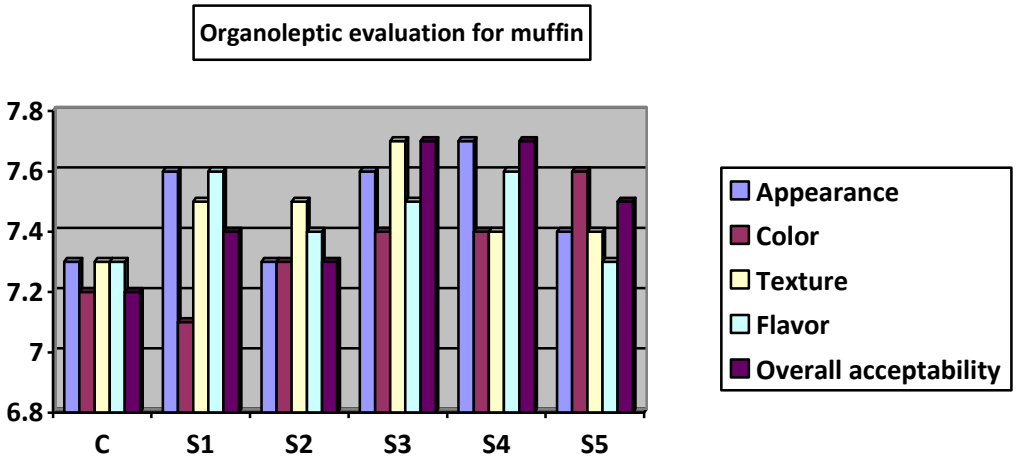
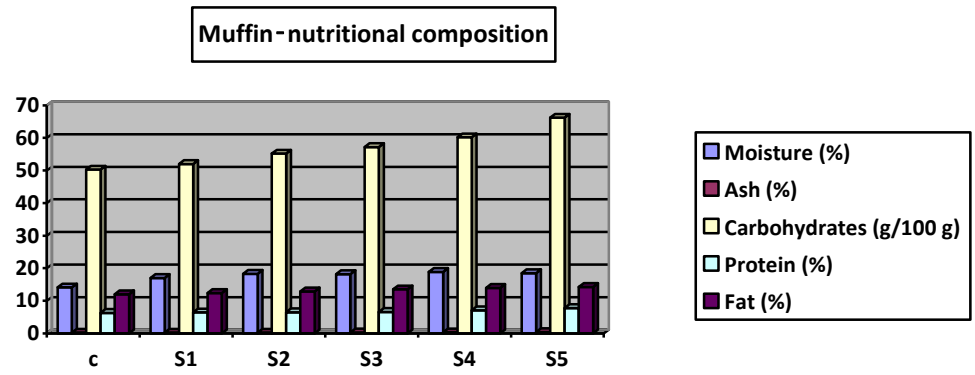
Packing in air tight covers

Fig. 1: S3=65% Maida flour substituted with 80% *Musa acuminate*, S3=65% Maida flour substituted with 90% *Musa acuminata*





IV. Conclusion

Among all the formulation (value added products) after the substitution of *Musa acuminate* the

nutritional composition (moisture, ash, carbohydrates, protein, and fat content and mineral composition (calcium, iron) will increased as compared to control sample. The organoleptic test showed that the substitution of 80% *Musa acuminate* and 90% of *Musa acuminate* were more acceptable. This study will help people to generate awareness for the supplementation of *Musa acuminate* in their daily diet to control micronutrient deficiency and increase nutritional status in a better way.

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