

FORMULATION AND PROXIMATE ANALYSIS OF SWEET POTATO POWDER INCORPORATED MILLET CAKE

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ABSTRACT

The study involves formulation of a sweet potato powder mix with kodo millet (KM) flour at different concentrations of SPMC refers to make cake 10% (SPMC1), 20% (SPMC2), 30% (SPMC3) and 40% (SPMC4) and analysed for its sensory evaluation and proximate composition. Incorporation of sweet potato millet cake resulted in a significant increase of nutritional ingredients. The SPMC3 was found to have fat (8.94%), protein (29.5%), fiber (2.14%) and ash (4.42%). Results of sensory evaluation showed that sweet potato powder and kodo millet can be utilized in formulation of Cake up to 20 per cent (SPMC3) was found to be well accepted.

INTRODUCTION

Sweet potatoes are a healthy root vegetable chock full of antioxidants that protect your cells from damage. Plus, the nutrients in sweet potatoes are excellent for your gut, eyes, immune system, and more. Sweet potatoes are rich in vitamins and minerals, including vitamin A, vitamin C, potassium, fiber, and zinc. Sweet potatoes are a powerhouse of nutrition and an excellent addition to nearly any diet. The antioxidants in the tuberous vegetable contain many health benefits, including by boosting the immune system, fighting cancer, and improving gut, heart, and eye health, and more. Surprisingly, boiling retains most nutrients and is one of the best ways to cook sweet potatoes.

The usage of Kodo millets as a food source can be dated back to centuries. It was thought to be one of the ancient grains cultivated by humans since the Neolithic period. The plant is thought to be originated in Africa and introduced to India where it is now grown primarily. Kodo millets are highly nutritious and make up a very balanced diet. They are a great source of proteins, dietary fiber, vitamins like niacin and riboflavin, minerals like copper, manganese, and phosphorus. Apart from that, Kodo millets or Arikelu also have considerable amounts of calcium,

magnesium, and sodium. They contain 8.3% Protein and 1.4% Fat Essential amino acids like lysine, threonine, and valine are also present in considerable amounts in this millet

Cake is a flour confection usually made from flour, sugar, and other ingredients and is usually baked. In their oldest forms, cakes were modifications of bread, but cakes now cover a wide range of preparations that can be simple or elaborate and which share features with desserts such as pastries, meringues, custards, and pies.

The most common ingredients include flour, sugar, eggs, fat (such as butter, oil, or margarine), a liquid, and a leavening agent, such as baking soda or baking powder. Common additional ingredients include dried, candied, or fresh fruit, nuts, cocoa, and extracts such as vanilla, with numerous substitutions for the primary ingredients. Cakes can also be filled with fruit preserves, nuts, or dessert sauces (like custard, jelly, cooked fruit, whipped cream, or syrups) iced with buttercream or other icings, and decorated with marzipan, piped borders, or candied fruit.

The aim of the present research study was to investigate the suitability for sweet potato flour Kodo millet (SPMC) in

development of Cake to raise the bar of nutritional index with consumer acceptability.

MATERIALS AND METHODS

Raw Materials:

Raw materials like sweet potato, Kodo millet, whole wheat flour, sugar, sodium bicarbonate, citric acid, salt etc. required during present investigation were procured from local market of loyal world, Mysore.

Processing Equipment:

The analytical equipment like muffle furnace, soxhlet extraction apparatus, sieves shaker, incubator, spectrophotometer, laminar air flow cabinet were made available in the laboratories of CFTRI, Mysore.

Materials and Methods

Preparation of sweet potato Flour

Thoroughly wash the sweet potatoes under running water to remove any dirt or debris. Using a sharp knife or vegetable peeler, carefully peel the potatoes. Removing the skin ensures that the flour will be smooth and free of any unwanted flavors. Slice the peeled sweet potatoes into thin, uniform slices. The thickness of the slices should be around 1/4 inch. This will promote even drying and prevent the flour from becoming too coarse. Oven-Drying: Preheat your oven to the lowest temperature setting (usually around 170°F). Spread the sliced sweet potatoes on a baking sheet and bake for several hours, or until they are completely dry and crispy. Once the sweet potato slices are completely dry, they are ready to be ground into flour. Use a high-powered blender, food processor, or coffee grinder to pulverize the slices into a fine powder.

Formulation of cake

The formulations of pancake were displayed in Table.1.

Treatments	Whole Wheat Flour	Kodo millet flour	Sweet Potato Flour
Control	60	40	-
SPMC1	60	30	10
SPMC2	60	20	20
SPMC3	60	10	30
SPMC4	60	-	40

Preparation of Sweet Potato Millet Cake

Take curd and powdered sugar (beat)





Add Whole Wheat flour
 ↓
 Add sweet potato powder, baking soda baking powder and essence
 ↓
 Mix the all ingredients to make cake batter
 ↓
 Pour the cake batter to the tray at 150-180°C for 10 minutes
 ↓
 let it cool and the cake is ready



Formulation of Cake mix flour

Treatments	Whole Wheat Flour	Kodo millet flour	Sweet potato flour	Kodo millet flour
Control	60	40	-	
SPMC1	60	30	10	
SPMC2	60	20	20	
SPMC3	60	10	30	
SPMC4	60	-	40	

SPMC – Instant Dry Mix

Preparation of pancake from Cake mix flour by reconstitution

Cake mix flour powder
 ↓
 Add 15ml oil and 130 ml water in 100g
 ↓
 Mixing Pour the batter in greased pan
 ↓
 Steaming 15 min in preheated pressure cooker
 ↓
 Garnishing Ready to serve

Sensory evaluation of pancake

The sensory quality characteristics of pancake prepared from various instant mixes were evaluated by panel of 10 semi-trained judges using nine-point hedonic

scales as described by Amerine *et al.* (1965).

Proximate composition of Cake

The Cake mix flour formulations and control sample were analysed by standard method for moisture, total fat, crude protein, ash and fibre (AOAC 2007). The carbohydrate content was calculated by different methods.

Result and Discussion

Sensory evaluation of Cake

Cake prepared with different formulations of cake mix were subjected for sensory evaluation to evaluate maximum acceptability of the product.

The data revealed that the pancake prepared from formulation SPMC2 i.e cake with 20% of Sweet Potato flour and 20 % of Kodo millet scored highest scores for all sensory parameters viz, colour (8.3), aroma (8.2), texture (8.2), taste (8.4) and overall

acceptability (8.1) as compared to other four formulations.

The highest score for colour was secured by SPMC2 sample (8.3) while lowest score by SPMC1 (7.6). The probable reason for these results could be the partial replacement of raw Kodo millet (brown colour) with SPM (Creamish colour). At moderate level of SPM addition in cake, aroma was found to be appreciable and treatment SPMC2 received highest score (8.2), even more than control. Texture score values also showed significant variation across the treatments as the level. The taste of cake was significantly influenced due to the addition of SPMC product. The treatment SPMC2 has got a maximum rating (8.4) for taste.

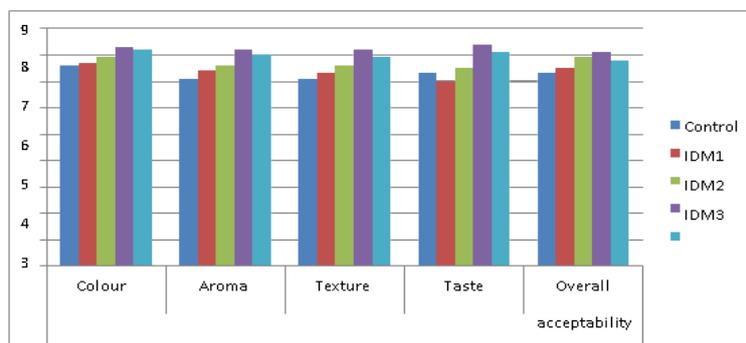


Figure.1 Sensory evaluation of different formulations of cake

These results are in good agreement with the findings of Mounika *et al.* (2017) who revealed that organoleptic acceptable Vanilla cake can be prepared by supplementing with 20% of Sweet potato and 20% of kodo millet in food products as an ingredient. Also, SPMC would be acceptable by consumers and the food industry as a promising food stuff that contains more nutritional and bio-functional components than ordinary rice products, as well as for improving sensory properties (Patil and Khan, 2011). The results pf

proximate analysis was depicted in Table.2.

Table.2. Proximate composition of Cake mix flour fortified with GKM

Treatments	Proximate composition (%)					
	Moisture	Crude fat	Crude protein	Crude fiber	Ash	Carbohydrate
Control	8.3	8.03	29.14	2.97	7.60	70.23
SPMC1	7.99	8.95	29.21	2.03	4.71	70.11
SPMC2	7.94	8.94	29.5	2.14	4.42	89.36
SPMC3	7.90	8.78	29.30	2.09	3.94	69.99
SPMC4	7.85	8.71	29.35	2.12	4.02	69.95

The moisture content of Cake varied from 8.3 to 7.85 percent with a lowest value in SPMC4 (7.85%) and highest in control sample. Results reported that fat content of cake for control, SPMC1, SPMC2, SPMC3, and SPMC4 sample were found to be 8.03, 8.95, 8.89, 8.78 and 8.71 % respectively. It can be concluded that addition of sweet potato flour Kodo millet into Cake mix floures will decrease the fat content. The protein content of different Cake samples ranged between 29.14 to 29.5%. The protein increased with increasing proportion of SPMC as compared to control. It's due to Kodo millet and Sweet potato as source of protein contribute on increasing protein content.

Conclusion

It can be concluded that Sweet potato flour and Kodo millet flour can be successfully incorporated in the formulation of Cake for improved nutritional quality with acceptable sensory attributes. The pancake prepared from Cake mix flour with addition of 20 per cent Sweet potato and Kodo millet (SPMC2) was found to be ideal in terms of nutritive and sensory parameters as compared to other formulations. The SPMC2 was found to have fat (8.94%), protein (29.5%), fiber

(2.14 %) and ash (4.42 %). This could be a step towards new product development by sweet potato powder and Kodo millet which helps to enhance the nutritional status of the population

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