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Product Development and Quality Assessment of Potential Health benefits through Multi Millet Cookies

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ABSTRACT

The significant health benefits of multi millet include protecting cardiovascular health, helping people achieve and maintain a healthy weight, and managing inflammation in the gut. Multi millets have rich in dietary fiber which helps to grow good bacteria it supports improve the digestive system. It contains high health benefits rich in antioxidants. A Multi millet biscuit was standardized by incorporating with three different flours finger millet (ragi), pearl millet (bajra), sorghum millet (jowar) and wheat flour at different levels. By substituting these three millet flours with wheat flour include brown sugar and milk powder formulation was standardized to make high Nutritive and healthy cookies Cookies are analysed for chemical and physical analysis and sensory characteristics. The result of total five selected samples in that best sample is three. After preparation of biscuit various physiochemical properties were determined nutritional parameters. The quality analysis after score revealed that cookies prepared from these multi millet cookies were highly acceptable with enhanced nutritional quantity and sensory evaluation.

Keywords : Cookies, Diet, Nutrition, Multi Millet, Health, supplement.

I. INTRODUCTION

Millets are particularly high in minerals like iron, magnesium, phosphorous. Millets are considered to be the oldest grains used for the house hold purposes. Millet are rich in all nutritious aspects like vitamins, fat, protein and especially in dietary fiber that help in providing various medical and health benefits. Inclusion of millet into diet will reduce the risk of cardiovascular problems helps in treating constipation diabetes etc. India is the largest producer of these gluten free coarse cereals and the prime consumer of millet. Millet is rich in niacin, which helps your body to manage more than 400 enzyme reactions. Niacin is also important for healthy skin and organ function. Infact, it's such an important compound that it is often added to processes foods to enrich them millet, especially the darker varieties, is also an excellent source of beta carotene. This natural pigment acts as both an antioxidant and as a precursor to vitamin A,

helping your body fight off free radicals and supporting the health of your eyes. Millet also provide other health benefits improve digestive health Millet is rich in dietary fiber, both soluble and insoluble. The insoluble fiber in millet is known as pre-biotic which means it supports good bacteria in your digestive system. This type of fiber is also important for adding bilk to stools, which helps in keep your regular and reduces your risk of colon cancer. The soluble fiber in millet can help reduce the amount of bad cholesterol in your blood. A risk factor for atherosclerosis. Soluble fiber turns into a gel in your stomach and absorbs cholesterol, allowing it to be safely carried out of your system. Some studies show that millet can also raise your good cholesterol levels and lower triglycerides. Because cholesterol is such a big risk factor for heart disease, eating millet regularly may help keep your heart healthier.

Finger millet contains about 5-8%protein,1-2% ether extractives,65-75% carbohydrates,15-20% dietary fiber and 2.5-3.5% minerals. It has the highest calcium content among all cereals(344mg/100g).Pearl millet consists of 11.6gm protein, 67.5gm carbohydrate, 8mg iron and 132 microgram of carotene which is highly to safeguard our eyes. Sorghum is a nutrient-packed grain that you can use in many ways. Its rich in vitamins and minerals like B vitamins, magnesium, potassium, phosphorous, iron and zinc

II. MATERIALS AND METHODS

2.1 Selection of ingredients

Pearl millet, finger millet, sorghum, whole wheat, skim milk powder, cocoa powder, baking soda, baking powder, ammonium bi carbonate, organic brown sugar, sunflower oil were used for making of cookies which is enhance the health benefits of consumers.

2.2 Preparation of millet flours

Finger millet, sorghum, pearl millet were thoroughly cleaned by removing damaged seeds, dust, dirt and admixture of other grains, the cleaned millets were roasted until light brown, these roasted millet were ground in a domestic grinder, this millet flours were sieved through a 1mm mesh, sieved the samples were kept in airtight containers until used

2.3 Flow Chart of cookies Making

Weighing all ingredients as per Formula.

⬇

Add all flours in bowl along with salt, baking soda, skim milk powder, cocoa powder.

⬇

In another bowl add organic brown sugar, oil, vanilla essence and mix it well.

⬇

Add wet mixture to dry mixture and mix it well until dough forms and allow 30 min

⬇

Scoops out some dough &press it into mould and carefully wriggle out the dough from mould.

⬇

Arrange them on tray and keep it in preheated oven at 180^{o}c for 15 minutes bake until biscuit gets brown color. ⬇

Cooling and Packing

2.4 Treatments for development of cookies

TYPE-1:

1. Wheat flour (25%)
2. Millet flours Mix (25%)
3. Organic brown sugar (25%)
4. Skim milk powder (5%)
5. Sun flower oil (20%).
6. Coco powder- 1gms

Type-2:

1. Wheat flour (20%)
2. Millet flours Mix (30%)
3. Organic brown sugar (25%)
4. Skim milk powder (5%)
5. Sun flower oil (20%).
6. Coco powder- 1gms

TYPE-3:

1. Wheat flour (15%)
2. Millet flours Mix (35%)
3. Organic brown sugar (25%)
4. Skim milk powder (5%)
5. Sun flower oil (20%).
6. Coco powder- 1gms

TYPE-4:

1. Wheat flour (10%)
2. Millet flours Mix (40%)
3. Organic brown sugar (25%)
4. Skim milk powder (5%)
5. Sun flower oil (20%).

TYPE-5:

1. Wheat flour (5)
2. Millet flours Mix (45%)
3. Organic brown sugar (25%)
4. Skim milk powder (5%)
5. Sun flower oil (20%).

2.5 Physical analysis of cookies

Diameter (D) :

The diameter of cookies was measured by laying six cookies edge to edge and measuring to the nearest cm (AACC, 1967).The cookies were rotated at 90c was re-measured as a check determination. The average value was reported in cm.

Thickness (T)

Thickness or height of the cookies was measured by stacking six cookies one above the other and the average value was expressed s cm (AACC, 1967).

Spread ratio (SR)

The spread ratio was calculated by dividing the average value of diameter (D)by the average value of thickness(T) of cookies (AACC,1967).

Percent spread factor (SF)-the percent spread factor was calculated by the following formula:

Percentage of SF=

SR of cookies prepared from blendx100

SR of cookies prepared from control

2.6 Evaluation of chemical analysis of cookies.

The nutritional values like moisture, protein, fat fiber, and ash content of cookies were determined by AOAC methods. The carbohydrates were calculated by difference. The sum of moisture, fat, protein, fiber and ash contents was subtracted from 100 to obtain the total carbohydrates by difference (Pearson, 1976).Energy was calculated as described by (Sukkar, 1985).

2.7 Evaluation of sensory attributes of cookies

The 9 point Hedonic scale score -card method was to determine the sensory characteristics of the cookies made. The quality factors such as colour, flavour, texture, taste, and overall acceptability were allotted a maximum score of 9 each.

III. RESULT AND DISCUSSION

Millets are gluten free and non allergic food stuff, good to be consumed by any people with no regard to ages. These millet cookies are nutritive snacks with high glycemic index.

3.1 Physical characteristics of cookies

The result of physical quality characteristics of the cookies prepared with multi millet flours was given in table-1

Treatments	Wt of (gm)	Diameter	Thickness (T)cm	Spread ratio D/T	%Spread factor
TYPE-1	09.32+0.01	4.83+0.04	0.79-0.01	5.96	100.01
TYPE-2	09.23-0.01	4.78-0.01	0.77-0.01	5.98	103.08
TYPE-3	09.22-0.01	4.81-0.02	0.79-0.01	5.99	103.11
TYPE-4	09.32-0.01	4.79-0.01	0.78-0.01	5.97	106.28
TYPE-5	09.30-0.01	4.82-0.01	0.77-0.01	5.96	105.29

3.2 Sensory quality characteristics of cookies

The mean score of sensory evaluation for the cookies are given in table-2.The type-5 had highest scores for all the sensory attributes compare to other treatments

Table-2 Mean sensory scores of cookies

Treatments	Taste	Colour	Texture	Flavour	Overall acceptability
TYPE-1	7.12-0.46	7.2-0.45	7.1-0.45	7.53-0.52	7.20.45
TYPE-2	6.50-0.69	6.8-1.12	6.9-0.01	6.3-0.48	6.6-0.55
TYPE-3	6.16-0.78	6.6-0.55	6.4-0.79	6.1-0.63	6.3-0.84
TYPE-4	6.82-1.11	6.6-0.55	7.3-0.49	6.9-0.55	6.9-0.59
TYPE-5	7.53-0.13	7.2-0.13	7.1-0.11	7.3-0.52	7.3-0.59

3.3 Nutritive value of cookies

Treatments	Moisture	Fat	Protein	Total Ash	Crude Fibre
TYPE-1	4.92	20.23	4.98	0.89	0.12
TYPE-2	4.26	20.86	5.26	0.99	0.11
TYPE-3	4.58	20.46	4.68	0.97	0.09
TYPE-4	4.28	20.58	4.92	0.93	0.13
TYPE-5	4.46	2075	5.13	0.87	0.10

IV. CONCLUSION

The study showed that multi millet cookies were increased protein, ash, iron, calcium and phosphorous levels. From the study, it may be concluded that locally available low cost ingredients available in the developing countries have a great potential in developing highly nutritious and acceptable food.

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