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Microbial Activity Of Homemade Kambu (Pearl Millet) Cookie-A Formulated Cereal Based Cookie

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Abstract: Cookies are liked by everyone.In modern trends most of them not consumed cereal products.Cereals are rich in carbohydrates and give more energy.The present study examined the best cereal cookie of Kambu has been found out by using microbial analysis. Kambu cookie was prepared at home with no added preservatives. Microbial activity is noted in 15th day,45th day and 60thday of the kambucookies. The parameters have taken for monitoring growth of Escherichia coli, salmonella, total bacterial count and total yeast and mould count.

Keyword: Kambu-a pearl millet,Shelf life, Microbial activity,

I. INTRODUCTION

There is no breakfast food that offers convenience and nutrition the way cereal does. But, when you go down the cereal aisle, you may be overwhelmed by the choices. How much sugar is too much? How much fiber and whole grains should you shoot for? You will be glad to hear that research is on cereal's side. In fact, a study published in this month's Journal of the American Dietitian Association found that 35 percent of children (9 to 13 years) and 25 percent of adolescents (14-18 years) consumed ready-to-eat cereal. When compared to the breakfast skippers and non-cereal eating kids, the cereal eaters had diets lower in fat and cholesterol and higher in fiber, vitamins, and minerals and these kids were leaner.(Deshmukh-Taskar PR. Et al, 2010)

It is known that "staling" occurs within a short period of time for fresh-baked goods. Thus, those prepared at a bakery for immediate sale have a very short shelf life, typically a day or two, up to at most one week. Packaging can extend that shelf life somewhat, but again such products inevitably will stale in a short time, typically within a week or two, at most. "Staling" involves many different physical and chemical factors. Texture staling is caused by recrystallization of the gelatinized starches, moisture drying, chemical changes causing flavor changes, and microbiological spoilage. Of particular importance is recrystallization of the starches(www.thecookieblog.com, cookies shelf life testing.)

II. MATERIALS AND METHODS

a). Preparation, procedure for Kambu cookies

Ingredients

Kambu flours-– 100grms

Maida flour - 20 grams

Icing Sugar – 100 grams

Butter – 50 grams

Raisin – 10 grams

Baking powder – ¼ tsp.

Vanilla essence-1/2 tsp

Salt-a pinch

Method of preparation

1. Sift the cereal flour and Maida in a big bowl and make a well in the centre.
2. Combine wheat flour, icing sugar, butter, a pinch of salt, baking powder and vanilla essence.
3. Beat on medium speed until essence very fluffy and well blended.
4. Divide the dough into desired size as per your cookies moulds.
5. Drop the dough on to the cookies moulds.
6. Bake at 100^0_C for 10 minutes.

b).Shelf Life

The cookies were subjected to shelf life analysis, which determines the accurate dates of the products, ensuring the quality remains acceptable and safe for consumers. The formulated five cereal based cookies and commercial cookie was examined initially, periodically after15 days, 45th day and 60th day for their microbial content. Escherichia coli, salmonella, total bacterial count and total yeast and mould count were carried out.

Bacteria, Yeasts and Molds spoil food after harvesting, during handling, processing and storage. But not all microorganisms cause spoilage of the food. Eg, Lactic Acid fermentation is involved in producing bacteria in the making of cheese and major dairy products and yeasts as leavening agents for the production of wine. However, except the microorganisms that is specially cultivated under controlled conditions for their beneficial effects. (Kendall, 2000).

Yeast are unicellular plants (fungi) widely distributed in nature and they grow well in a slightly acid medium in the presence of sugar and water. They are found in fruits, cereals and other sugary foods. They are also found in air, soil and skins of animals. They are larger than bacteria. The individual cell length is of about 10µm and the diameter is about a third of this size. Most yeast is spherical or ellipsoidal in shape(Khotari et al., 2003). Bacteria, Yeast, Molds multiply best between 16° to 38°C. Some grow even at 0° C and other at a temperature as high as 100°C. They alter food constituents. Some can hydrolyze starch and other complex organic matter like cellulose, lignin and pectin. Others can hydrolyze lipids and produce rancidity. Still others digest proteins and produce putrid and ammonia like odours. They can also bring about decolourization of foods, produce acids, gases or toxins. (John, 2009)

In the present study, the microbial analysis has been carried out thrice that is on 15th day of the product,45th day and 60th day for five varieties of developed cookies and commercial cookies.

Consolidation and Analysis of the data

The collected data was then compiled and interpreted statistically. The following statistical analysis was done. Mean standard deviation were calculated for the microbial growth of kambucookie.

III. RESULT AND DISCUSSION

Kambu Pearl Millet

In India, staple crops such as pearl millet (PM; Pennisetumglaucum) are consumed as part of the daily diet, particularly in Maharashtra, Gujarat, Rajasthan and Karnataka. The iron and zinc concentration in biofortified PM is reported to be 70–85 and 35–40 parts per million (ppm), respectively. (Huey SL, 2017).Pearl millet /Pennisetumglaucum is the sixth most important cereal in the world and is the widely cultivated among all the millet species worldwide, followed by finger millet (Eleusinecoracana), foxtain millet (Setaraiaitalica) and proso millet (Panicummiliaceum).(Food and Agriculture Organization of the United Nation, 2016)

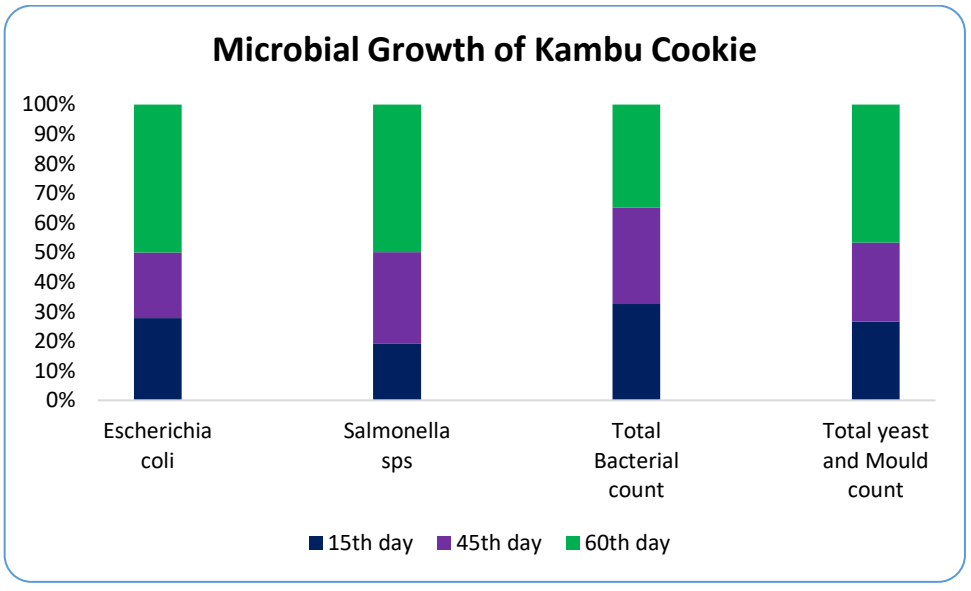
Pearl millet is a major cereal in arid and semi-arid regions both in India and sub-Saharan Africa where it contributes to food security, but it also has other uses, such as source of feed and fodder for livestock, fuel and construction materials. It is mostly grown in areas with limited agronomic potential characterized by low rainfall (300–500 mm) and marginal soils. These aspects make millet an important food staple all over the African

continent, especially in the semi-arid areas of the Western Sahel where other crops tend to fail because inadequate rainfall and poor soil conditions. (Yadav HP, 2016).

Mean and Standard Deviation ofKambu Cookies with Respect to Microbial Growth in 15th Day, 45th Day & 60th Day of The Product

Microbes	Mean ± SD	Days		
		15th	45th	60th
Escherichia coli	Mean	1.67	1.33	3.00
	SD	(.58)	(.58)	(1.00)
Salmonella sps	Mean	1.67	2.67	4.33
	SD	(1.15)	(.58)	(.58)
Total Bacterial count	Mean	4.67	42.67	45.67
	SD	(2.52)	(2.52)	(2.52)
Total yeast and Mould count	Mean	1.33	1.33	2.33
	SD	(.58)	(.58)	(.58)

On 15th day of the product,the mean value of Total yeast and moulds is 1.33 CFU,the value is less than other microbes.The mean value of E. coli and salmonella is equivalent (1. 67CFU).The value of total Bacterial count is higher than rest of the microbes(42.67CFU).On 45th day,the mean value of E. coli and Total yeast and mould count is equivalent (1.33CFU). The mean value of salmonella is slightly higher than 15th day.The value of Total Bacterial Count is too high (42.67CFU). On 60th day the mean value of Total Bacterial Count is (45.67CFU) and salmonella is 4.33CFU), both are double the volume than 45th day. On 60th day, the microbial activity of all microbes are increased gradually.



SUMMARY AND CONCLUSION

The microbial activity of Kambu cookie was done by using Total count that measures the number of viable bacterial in a sample and also carried out by the standard AOAC method.The microbial activity of Total Bacterial Count, Salmonella, E.coli was proliferated from the 15th day of the kambu cookies. It proven that the shelf life of a homemade kambu cookie is 15 days.

This study was focused on the need and important of low cost cereal based cookies and the product development in extending the shelf life of cookies.I am sure this information will be much useful to know about the nutrition behavior in model systems and empirical results from a variety of baked products. The results should be especially useful in product development to optimize product quality and nutrient content.

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