



MINI-REVIEW

Utilization of finger millet in food preparations: a mini review

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ABSTRACT

In India, finger millet occupies the largest area under cultivation among the small millets. Finger millet stands unique among the cereals such as barley, rye and oats with higher nutritional contents and has outstanding properties as a subsistence food crop. With the changes in scenario of utilization of processed products and awareness of the consumers about the health benefits, finger millet has gained importance because of its functional components, such as slowly digestible starch and resistant starch. Finger millet can be used in a variety of ways and is a great substitute for other grains such as rice and other starchy grains. Processing them using traditional as well as contemporary methods for preparation of value added and convenience products would certainly diversify their food uses. Their exploitation for preparation of ready-to-use or ready-to-cook products would help in increasing the consumption of millets among non-millet consumers and thereby nutritional security. This review will focus on the possibilities of utilizing finger millet as one of the basic ingredients that are being incorporated in food products and their effect on the quality attributes of the prepared products..

Keywords: Finger millet, nutrition enhancement, nutrient rich bakery foods, nutrient rich traditional foods

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INTRODUCTION

Finger millet grains contain high quantities of dietary fibre, carbohydrates, iron and calcium in comparison to other cereal grains. It also contains various antioxidant rich phenolic compounds. The essential amino acids like arginine, lysine, methionine etc. are present in large amounts and contribute for essential health promoting functions. Processing of finger millet grains assist in converting the grains to edible forms of food products. It is usually made into flour and a variety of food preparations like cake, pudding, porridge, papad etc. are made. The malting process can be used in making cheap digestible liquid foods for infants and children. The total dietary fiber of finger millet grain is relatively higher than that of most of other cereal grains wheat, rice, maize and sorghum. Dietary fibers can provide a multitude of functional properties. Besides health benefits, dietary fiber supplementation increase the bulk by enhancing water binding capabilities and carries great economic advantages for both the consumers and processors. In the current review an attempt has been made to collect the available information from existing literature related to the food products developed utilizing finger millet to improve the nutritional properties.

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PROCESSING OF FINGER MILLET

Finger millet grains can be processed in several ways to meet the requirement of the consumers. In order to develop consumable products, the different processing techniques include milling, malting, popping, puffing, flaking, debraning, etc. (Shobana et al., 2013) are being carried out. Besides having a good shelf life, the flour is fat and gluten-free, is easily digestible and requires little cooking (Saturni et al., 2010). The malted grain flour is also good nourishing food for infants and invalids. In order to make millet value chain sustainable the production and promotion of various high yielding varieties of millets along with production and preparation of various millet based products like bakery products, extruded foods and beverages is very essential.

Finger millet cookies

Sudha et al. (2019) have explored the potentiality of using finger millet flour in the preparation of cookies. Process technology was developed for millets by making cookies from finger millet flour and wheat flour blends. The various ratios of wheat flour and finger millet flour used were 0:100 (T₀), 20:80 (T₁), 30:70 (T₂) and 40:60 (T₃). It is concluded that the sample at blend ratio Wheat flour: Finger millet flour: 260:760g (T₂) for variety "VR-988" was best cookies highly acceptable by panel members for their taste, flavor and texture than cookies of other composition cookies and even in other varieties.

Similarly findings of Kohli et al. (2019) revealed that the fiber, protein, vitamin C and ash content of biscuits increased with addition of pomace and germinated finger millet flour. The biscuit was prepared by addition of dried amla pomace powder and germinated finger millet flour. The fiber and vitamin C content of biscuits increased with increase in pomace concentration in the biscuits. The protein and ash content of biscuits are higher than the controlled biscuits. The fat content of biscuits decreases with increase in pomace concentration. The inclusion of amla pomace powder for biscuit is the good approach to have the good amount of fibre and vitamin C in bakery products. The use of finger millet flour also improved the nutritive value of the biscuits.

Malted ragi flour cake

Cake is one of the most popular bakery product. Generally it is prepared from refined wheat flour and is a rich source of protein, fat and carbohydrates but limiting in minerals and dietary fibres. Desai et al. (2010) have investigated the effect of addition of malted ragi flour on the sensory and nutritional qualities of cake. The mineral and fibre contents of cake samples were improved by the use of various blends of wheat flour and malted ragi flour (80:20; 60:40; 50:50; 40:60 and 30:70) with other ingredients. The results showed that cake samples enriched with malted ragi flour were rich in mineral contents like calcium, iron, phosphorus and crude fibre as compared to the control sample which was prepared using only ragi flour. Sensory scores of cake sample prepared with 50% wheat flour and 50% malted ragi flour was same as the control. The cake prepared with 70% malted ragi flour had highest mineral and fibre content, but the sensory score was low due to the loss in sponginess and increased intensity of brown colour. All the cake samples prepared with different combinations of malted ragi flour were organoleptically acceptable to the panellists. These cakes may be beneficial for growing children, teenagers and pregnant and lactating women due to its high nutritive value.

Finger millet porridge

There is an increased interest in finger millet due to its excellent nutritional value and health benefits. Because of its good thickening properties traditionally in some parts of India it is used for preparation of porridge. Porridge (koozh) is one of the traditional foods made from finger millet grains. Subastri et al. (2015) have investigated the preparation of porridge from germinated and fermented finger millet flour. Germinated and non-fermented koozh has more macro-nutrients when compared to those of other preparations; on the other hand free amino acid, phytochemicals, micro-nutrients such as selenium and radical scavenging activity are higher in fermented koozh sample. The major minerals such as calcium, potassium and phosphorous were higher in all preparations of koozh when compared to those of other mineral contents. But calorific value of koozh samples did not show any considerable difference among different samples. It is evident in the koozh prepared from germinated grains brings out desirable nutritional changes due to break down of complex compounds into a simple form, where as fermentation intensifies the flavor and further simplify the protein and carbohydrate. Hence it may be concluded the koozh made from germinated and fermented grains is considered to be easily digestible and energetic drink.

Finger millet khakhra

A major reason behind popularity of finger millet is roti making quality of its flour due to lack of gluten. This problem is answered by adding wheat flour to the finger millet flour in a fixed proportion to impart it elasticity. Khakhra is a very thin, crispy, crunchy, healthy and flavoured snack product usually served as a breakfast dish and mostly common in the Gujrat and Rajasthan. Khakhra is made by mixing of wheat flour, salt and masala. Oil, water or milk are added and kneaded to make a soft dough. This dough is then rolled into small balls and flattened. These are then roasted over low heat and pressed via wooden press, until crisp and light brown in color.

According to the investigations of Giridhar et al. (2019) the khakhra when prepared by using finger millet as a major ingredient provided a much more nutrition in terms of protein, carbohydrates, minerals and dietary fibers in comparison with the traditional khakhra that is made of wheat flour. Addition of finger millet flour into traditional khakhra makes it more nutritious and also helps in improving the keeping quality of the end product. The optimum amount of finger millet flour that can be used in the process of preparation of khakhra is up to 10%.

CONCLUSION

The underutilized finger millet can be processed and value added effectively to produce consumer acceptable products. Production of these nutritionally enriched processed foods will be the best way of dissemination and augmentation of its consumption among the population. Foods from millets will not only help the producer in improving their socio-economic status but also help in improving the health of the nation.


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