

**RESEARCH ARTICLE :**

# Foxtail millet (*Sataria italica*) instant puliogare mix

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**ARTICLE CHRONICLE :**

**Received :**

10.07.2017;

**Accepted :**

23.07.2017

**SUMMARY :** Foxtail millet (*Sataria italica*) is an annual warm season grass which was used to prepare some foods in some parts of Karnataka. Foxtail millet is highly nutritious, non-glutinous and not acid forming foods. Hence, they are soothing and easy to digest. The present study was focused on development of ready-to-cook puliogare mix using foxtail millet rice. The proximate composition of the puliogare mix was found to contain 13.50 (g), 4.50 (g), 7.71 (g), 68.22 (g) and 365 (Kcal) and 8.20 (mg) of protein, fat, crude fibre, carbohydrates, energy and iron, respectively. The product was stored in three different packaging materials namely, Polyethylene, Polypropylene and Aluminium Laminated Foil pouch for 3 months under ambient condition for shelf-life study. Ready-to-cook puliogare mix was subjected to sensory evaluation and nutritional analysis. The results of the study revealed that ready-to-cook puliogare mix packed in aluminium laminated foil pouch showed highest score with respect to appearance (7.2), colour (7.0), aroma (6.4), taste (7.0) and overall acceptability (7.0) compared to puliogare mix stored in other two packaging materials.

**KEY WORDS :**

Foxtail millet,  
Packaging materials,  
Shelf- life

**How to cite this article :** Satishkumar, Farheentaj, Subramanya, S. and Geethak (2017). Foxtail millet (*Sataria italica*) instant puliogare mix. *Agric. Update*, 12(TECHSEAR-2) : 343-346; DOI: 10.15740/HAS/AU/12.TECHSEAR (2)2017/343-346.

## **BACKGROUND AND OBJECTIVES**

Millets can be cultivated in a wide range of soils and climates are of special importance in semiarid regions because of their short growing seasons (Schery, 1963). *Sataria italica* also known as foxtail millet. Foxtail millet is one of the oldest cultivated millets. Three to four decades ago, foxtail millet was consumed as the staple food. Foxtail millets are widely cultivated in China, India and Africa. Western world and developed nations are slowly accepting it as food for humans as a nutritious substitute for healthier diets

(Baker, 1996). Foxtail millets are cultivated as bird food in America. It has double quantity of protein content compared to rice. It controls blood sugar and cholesterol. It increases disease resistant capacity when consumed and is considered ideal food for people suffering from diabetes and gastric problem.

Foxtail millets are high in calories, giving strength and energy for farmers to work actively in fields. Foxtail is a vegan food and also gluten free cereal. Foxtail is rich in proteins, and low in fat. Foxtail has good amount of fibre content, calcium, iron, potassium, magnesium and carbohydrates. It

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does not have sugar in any form. Consuming organic foxtail has more benefits because it's free of pesticide residues.

Foxtail millet is a diabetic food. Unlike rice, foxtail millet releases glucose steadily without affecting the metabolism of the body. The incidence of diabetes is rare among the population which consumes foxtail millet diet. Foxtail millet is rich in smart carbohydrates, the kind which doesn't increase the blood sugar levels immediately. It is rich in dietary fibre and minerals like iron and copper. Due to this, it helps to reduce the levels of bad cholesterol and keeps the immune system strong.

Foxtail millet provides a host of nutrients has a sweet nutty flavour and is considered to be one of the most digestible and non-allergic grains available. It contains fibre, protein, calcium and vitamins. It is a nutritive food for children and pregnant women. It is rich in dietary fibre and minerals such as copper and iron that keep one's body strong and immune (Schery, 1963).

Rice is obtained by milling the seed to remove the husk. During this process, we take care that the bran is not removed so we get unpolished, whole grain rice. The bran contains vital nutrients which is essential for the wellbeing of our body. Foxtail milletrice can be used to prepare everything that one makes with paddy rice- all the biryanis, pulavs, mixed rices and puliogare etc.

## RESOURCES AND METHODS

### Procurement of raw materials :

Whole Foxtail Millet was procured from PC Unit AICRP on Small Millets, UAS, GKVK, Bangalore. Other ingredients were obtained from local market, Bangalore.

### Milling of foxtail millet :

Milling of foxtail millet was done byAVM centrifugal dehuller.

### Ingredient used for instant foxtail millet puliogare mix :

*Preparation of instant foxtail millet puliogare:*

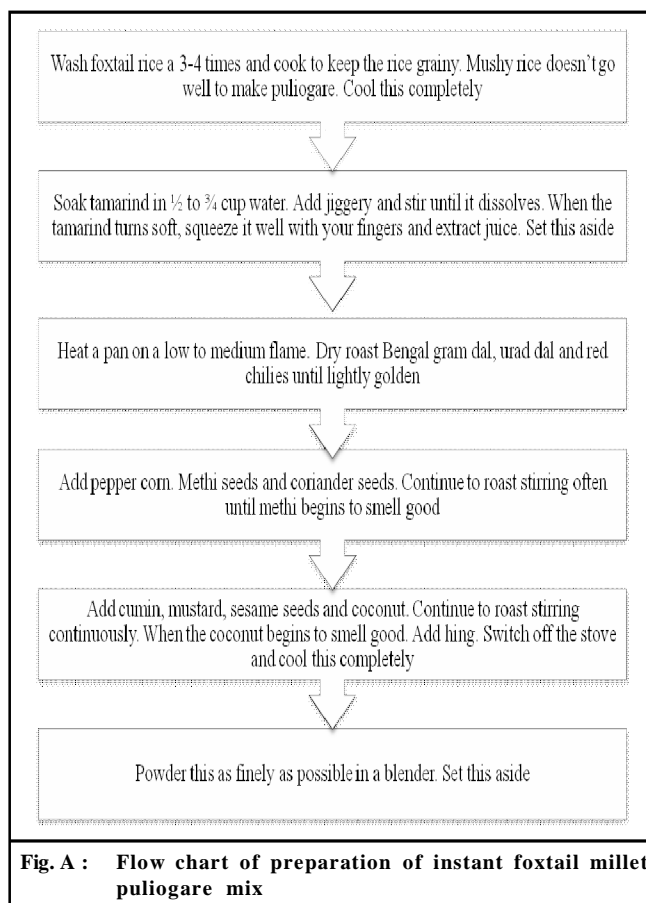
*Preparation of puliogare from foxtail millet puliogare mix :*

Take the puliogare millet mix add 2 cup of water to it, put it into pressure cook for 4 Whistle.

*Nutrient composition of foxtail millet puliogare mix :*

Nutrient compositions of developed mix were

Ingredients	Compositions
Foxtail millet rice (g)	250
Red chilli (g)	15
Urad dhal (g)	5
Black pepper (g)	5
Zeera (g)	7.5
Mustard seed (g)	5
Jaggery (g)	20
Dry coconut (g)	45
Curry leaves	5
Hing (g)	2.5
Salt (g)	7.5
Dhaniya powder (g)	12.5
Tamarind powder (g)	30
Ground nut (g)	50
Till (g)	15
Oil (ml)	10-20
Methi seeds (g)	2.5
Bengal gram(g)	5
Bengal gram (dal g)	7.5



**Fig. A : Flow chart of preparation of instant foxtail millet puliogare mix**



**Fig. B : Foxtail millet puliogare**

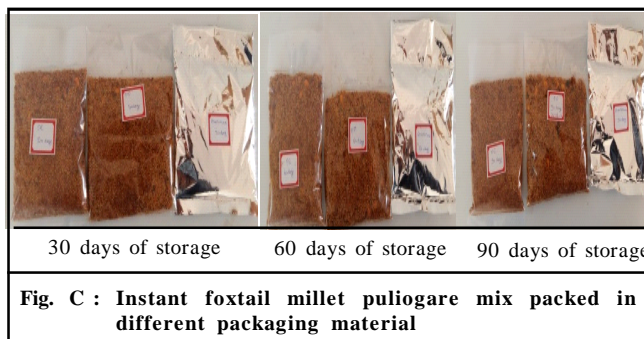
calculated by computational method using the analyzed nutritive value of foxtail millet.

**Sensory evaluation of instant foxtail millet puliogare:**

Developed products were evaluated by 10 semi-trained panel members from the Centre of Excellence on Small Millets, and AICRP on Post-Harvest Engineering and Technology, GKVK, UAS, Bangalore. The products were evaluated for appearance, colour, aroma, taste and overall acceptability using 9 point hedonic scale.

**Shelf-life study of developed instant foxtail millet puliogare mix :**

The accepted foxtail millet puliogare mix from sensory evaluation were packed in three different packaging materials namely, Polyethylene covers (PE 200 gauge) Polypropylene covers (PP 200 gauge) and Aluminium Laminated Foil Pouches (200 gauge) for



**Fig. C : Instant foxtail millet puliogare mix packed in different packaging material**

shelf- life studies under ambient condition (28±2°C). The sensory evaluations of these stored products were done at interval of 0, 30,60and 90days.

**OBSERVATIONS AND ANALYSIS**

The results obtained from the present study as well as discussions have been summarized under following heads:

**Nutritive value :**

The nutritional composition of foxtail millet puliogare mix revealed that it contained high protein, fat, crude fibre, carbohydrates, energy and iron content of 13.50 per cent, 4.50 per cent, 7.71 per cent, 68.22 per cent 365 Kcal and 8.20 mg, respectively.

**Shelf-life study :**

The effect of storage on the sensory evaluation of the foxtail millet puliogare mix stored at ambient temperature is presented in the Table 1. As the storage time increases the scores for all sensory characteristics decreases. There is a significance difference were observed in appearance, colour, aroma, taste and overall acceptability scores under different packaging condition.

The sensory score for “Appearance” of puliogare mix stored in various packages for different storage

**Table 1: Mean sensory scores of puliogare prepared from stored foxtail millet puliogare mix**

Sensory parameters	Packaging materials											
	Polyethylene				Polypropylene				Aluminium laminated pouches			
	Storage period (Days)				Storage period (Days)				Storage period (Days)			
	0	30	60	90	0	30	60	90	0	30	60	90
Appearance	7.5	7.0	6.5	6.5	7.5	7.5	7.0	6.3	7.5	7.5	7.4	7.2
Colour	7.5	7.0	6.0	6.0	7.5	7.3	7.0	6.5	7.5	7.3	7.0	7.0
Aroma	7.0	7.0	6.5	6.3	7.0	6.7	6.4	6.2	7.0	6.8	6.5	6.4
Taste	7.5	7.0	6.5	6.0	7.5	7.2	6.5	5.6	7.5	7.5	7.3	7.0
Overall acceptability	7.5	7.0	6.5	6.0	7.5	7.2	6.9	5.8	7.5	7.5	7.3	7.0

periods are presented in Table 1. The Appearance scores generally decreased with storage period. The Appearance scores of puliogare mix decreased from an initial value of 7.5, 7.0, 6.5 and 6.5 in Polyethylene; 7.5, 7.5, 7.0 and 6.3 in Polypropylene; 7.5, 7.5, 7.4 and 7.2 in Aluminium laminate pouch after 0, 30, 60 and 90 days of storage, respectively. The results showed that puliogare mix packed in aluminium laminate pouch maintained a high acceptability score of 7.2.

The sensory score for “Colour” of puliogare mix stored in various packages for different storage periods are presented in Table 1. The colour scores of puliogare mix decreased from an initial value of 7.5, 7.0, 6.0 and 6.0 in Polyethylene; 7.5, 7.3, 7.0 and 6.5 in Polypropylene; 7.5, 7.3, 7.0 and 7.0 in Aluminium laminate pouch after 0, 30, 60 and 90 days of storage, respectively.

The Aroma scores generally decreases with increase in storage period. The Aroma scores of puliogare mix decreased from an initial value of 7.0, 7.0, 6.5 and 6.3 in Polyethylene; 7.0, 6.7, 6.4 and 6.2 in Polypropylene; 7.0, 6.8, 6.5 and 6.4 in Aluminium laminate pouch after 0, 30, 60 and 90 days of storage, respectively. The results showed that puliogare mix packed in Aluminium laminate pouch maintained a high acceptability score of 6.4.

The sensory score for “Taste” of puliogare mix stored in various packages for different storage periods are presented in Table 1. The taste scores generally decreases as the storage period increases. The taste scores of puliogare mix decreased from an initial value of 7.5, 7.0, 6.5 and 6.0 in Polyethylene; 7.5, 7.2, 6.5 and 5.6 in Polypropylene; 7.5, 7.5, 7.3 and 7.0 in Aluminium laminate

pouch after 0, 30, 60 and 90 days of storage, respectively.

The overall acceptability scores of puliogare mix decreased from an initial value of 7.5, 7.0, 6.5 and 6.0 in Polyethylene; 7.5, 7.2, 6.9 and 5.8 in Polypropylene; 7.5, 7.5, 7.3 and 7.0 in Aluminium laminate pouch after 0, 30, 60 and 90 days of storage, respectively. The results showed that puliogare mix packed in aluminium laminate pouch maintained a high acceptability score of 7.0.

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