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Original Article

ORGANOLEPTIC ACCEPTANCE OF 'FURA' PRODUCED WITH MALTED GRAINS OF *Pennisetum typhoides* (BURM, F.) (STAPF AND HUBBARD)

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ABSTRACT

Grains of *Pennisetum typhoides* were malted for production of 'fura' beverage and evaluated for organoleptic acceptance, compared with the traditional product made with unmalted grains. The locally obtained grains were cleaned, germinated and kilned. The beverage was produced with the malted and unmalted grains of the *P. typhoides* traditional way. The acceptability of the 'fura' product was determined on a 3-point wanted scales of best (3), second (2), and least (1). The 'fura' product made with two days malt was most significantly ($p<0.05$) acceptable to four groups of assessors in a community that consumed the beverage. Malting influenced the organoleptic characteristics of the product.

Key words: Cereal, Malting, Beverage, Organoleptic acceptance, Product variety.

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INTRODUCTION

Malting of the grains of *Pennisetum typhoides*, like other types of grains including an intentionally controlled germination and kilning. The process of germination increases relative nutritive' value (%RNV) significantly in cereals (Wang and Fields, 1978; Hamad and Fields, 1979; Hashim and Fields, 1979). Germination is also beneficial in reducing some of the antinutritional factors in cereal and legume seeds (Hsu *et al*., 1980; Collins and Saunders, 1976). During the kilning process, colour and flavor ingredients are developed (Westermann, and Huige in Peppler and Perlman, 1979). The malting process therefore imparts nutritional and organoleptic changes in the seeds and subsequently in the food product. Wang (1977) and Hashim and Fields (1979) detected bitterness in the corn products made from germinated corn.

The grains of *P. typhoides*, locally called 'maiwa' are a staple crop, especially in the northern Nigeria. The majority of the people in the developing countries depend mainly on cereal grains as their staple food (Maggie and Fields, 1981). 'Fura' is one of the food products of the millet, which is a popular food drink tha

is traditionally consumed by the Hausas and the Fulanis of Northern Nigeria and the people of the Republic of Nigeria. People of other tribes that settle in Northern Nigeria are also fast adopting 'fura' as a non-alcoholic beverage, The popular cereals for producing 'fura' are the species of this *Pennisetum*, though in some parts of Hausa land rice is also used. Germination and kilning are inexpensive and simple biotechnological method for Improving nutritive and organoleptic characteristics of the grain and the food product.The aim of this study was to evaluate the acceptability of the 'fura' produced with malted millet grains among different age groups of the communities where 'fura' is traditionally consumed. This study was undertaken as a preliminary investigation to a detail study of sensory responses and nutritional impact of malting on the consumers

MATERIALS AND METHODS

Procurement and Malting of the Millet Grains

Three liter bowlfuls (2kg) of grains of *Pennisetum* sp were obtained from Sokoto Central Market. The grains were cleaned of stones and all other foreign materials. Two bowls of the grains were thinly spread on moist jute sack. Water was sprinkled at an interval of 4hour to keep the sack and the grains moist. The condition was maintained in a Well-ventilated (37±2°) room until the grains sprouted for 24 hours and for 48 hours (malting)

At the end of the sprouting the malted grains were dried in oven at 55°C (Kilning). The remaining bowl of the grains served as the unmalted grains for control study.

Production of 'Fura' with the Grains

The malted or unmalted grains were processed in the traditional way for the production of 'fura'. Two kilograms of the malt or grains was used in each process.

Traditionally, fura preparation involves dehusking of grains by abrasion; using mortar and pestle. The endosperm of the grain washed, rinsed, ground into flour and sieved. The flour was mixed with little water to make a paste and then molded with hand into balls, the molds were put into boiling water and cooked for 40 minutes, and they were then crushed in a calabash and mixed with 500 ml of tap water. Fig. 1 shows a flow chat of the traditional production of 'fura'.

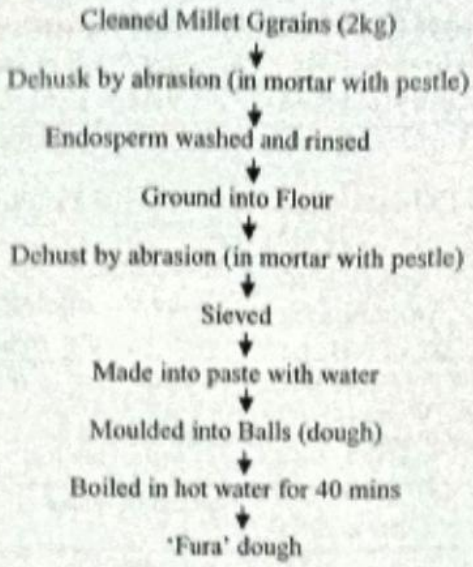

Fig. 1 Flow Chart of Traditional Preparation of Fura (Personal Communication)

Acceptability Evaluation

'Fura' types made from unmalted grains of millet and malt from 24hrs and 48 hrs germination were compared based on general acceptability, namely taste, colour and texture. The best was scored 3, second 2, and the least 1. Assessments of the fura types were done by four groups of persons; Primary school pupils (16), Secondary School Students (18), University Undergraduates (18) and the Community Elders (18).

Statistical Analysis

The data generated were analyzed for significance differences using one way and 2 – way ANOVA. One way ANOVA analyzed for difference in values for samples of 'fura' by each group of persons. The 2 – way ANOVA closings compared the assessments given by the different group of persons to judge overall acceptability of the 'fura' types.

RESULTS AND DISCUSSION

The 'fura' product that was the most acceptable to pupils was that produced from millet malts from 48 hrs germination (2.78) followed by that from malts of 24 hrs germination (2.0). 'Fura' from unmalted grains (1.17) was least wanted. The mean scores by secondary school students of the 'fura; products were in the same pattern as the pupils; 48 hrs malted (2.78), 24 hrs malted (2.0) and unmalted (1.22). Undergraduates scored the 'fura' products as 2.89, 2.0 and 1.11 for fura from 48 hrs malt, 24 hrs malt and unmalted grain 'fura' respectively. Similarly, the elders scored them as 3.0, 2.0 and 1.0 (Table 1) respectively. The assessments of 'fura' types by the different groups of persons showed no significant difference ($P>0.05$) (Table 2). The responses from difference groups of persons were similar on each of the malt products.

Table 1: Mean taste scores of 'fura' made from malted and unmalted grains of millet

Assessors	Malted for 24 hrs	Malted for 48 hrs	Unmalted
Prim. Sch. Pupils	2.0[b]	2.78[a]	1.17[c]
Sec. sch. Students	2.0[b]	2.78[a]	1.22[c]
Undergraduate students	2.0[b]	2.89[a]	1.11[c]
Elders	2.0[b]	3.0[a]	1.0[c]

Means with same letter are not significantly different

Table 2: Comparison of means of scores from malted and unmalted 'fura; by different groups of assessors

Assessors	Number of values	Mean score
Pri. Sch. Pupils	48	2.0[a]
Sec. sch. Students	54	2.0[a]
Undergraduates	54	2.0[a]
Elders	54	1.98[a]

Scores are not different

Statistical comparison of the 'fura' products showed that both 24 hrs and 48 hrs malted grains were significantly different ($P<0.05$) from each other and from the product of unmalted grains of *P. typhoides*. This observation confirmed an acceptability of a food may be due to taste, colour and appearance (Paradez-lopez *et al*., 1990).

Kneen and Dickson (1967) reported that modification of the cell wall during malting is primarily responsible for the physical changes; this may as well be true of the result of this study since the husking is similar to cell wall modification. Early in malting, proteolytic enzymes are elaborated and renders about 40% of the protein soluble in dilute salt solution; implying an increase in relative nutritive value (%RNV). In later stage of malting, starch is hydrolyzed to increase the sugar content and also improve Vitamin C and the flavour (Oyenuga, 1968). 'Fura' produced with the longer malting period therefore, is likely to contain higher content of sugar. Higher sugar content is also likely to impart longer shelf life on the 'fura'.

The acceptability of the 'fura' products of malted and unmalted grains show that there is higher preference for 'fura; produced with longer malt period. The eventual decision to go for a particular type of 'fura' would depend, apart from taste, on the yield of 'fura' derivable from a given quantity of grains and the nutritional value. Further work is

therefore recommended to determine the yield 'fura' per quantity of grain type, the length of malting and their likely respectively nutritional attributes.

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