

Effect of Location and Storage Environment on the Quality Attributes of Gari in South-Western Nigeria

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Abstract: A study was carried out to determine the effect of location and storage environment on the quality attributes of gari in some areas in Ibadan located in the southwestern region of Nigeria. Proximate analysis was done to evaluate the compositional attributes of gari from different locations, while consumer acceptability of gari samples were evaluated by untrained ten membered panel randomly selected from male and female adults. Crude protein (1.46%) and ash content (2.39%) of gari from Apata iso-onigari were highest. Gari from Okoro village was significantly higher in ether extract (0.5%). Calcium content (0.3%) was significantly higher in gari from Okoro village than other samples. Also the P (0.0027%), Mg (0.0020%) and K (0.095%) contents of gari from Army barrack was significantly higher. There was an increase in moisture content as the period of gari storage was increased. Sensory evaluation scores showed that all the gari samples were not rejected after 28 days of storage at ambient temperature conditions. Location and storage at ambient temperature did not mar the qualities of the gari samples.

Key words: Gari • ambient temperature • quality • location

INTRODUCTION

In Nigeria, the consumption of starch based food tubers and cereals is very frequent amongst the people. This high intake could be related to their low price and availability throughout the year [1, 2]. It has been estimated that Nigeria produces a total of 10 million tonnes of cassava per annum [3].

Gari is the product obtained when cassava is grated, de-watered, fermented and roasted. It is usually prepared by first peeling the cassava roots, washing and then grating. The resulting pulp is then packed into cloth bags.

Heavy weights such as stone and logs are piled on the bag to press out the moisture and the contents allowed to ferment for four days in the bags. When the meal is sufficiently dry, it is forced through a sieve and then roasted inside a shallow iron pan [2].

Gari although it is poor in protein, is the most important staple food in Nigeria that is eaten equally by both rich and poor [4].

Although gari consumption is very prominent in the Southern part of Nigeria, there is little information on the influence of locational production and storage environment on the quality attributes of the product.

Hence, the objective of this research work is to evaluate the effect of location and storage environment on the quality attributes of gari produced in some popular areas in Ibadan.

MATERIALS AND METHODS

Raw materials: Fresh samples of gari processed from local cassava variety (Okoiyawo) were obtained from eight factories in Ibadan metropolis namely, Ogodo, Orita challenge, Apata Agbekoya, Apata iso Onigari, Eleyele Temidire, Okoro village and Army barracks Sango. They were then packed in polyethylene bags and stored at room temperature for 28 days.

Chemical analysis: All chemical analysis were carried out by AOAC [5].

Sensory evaluation: Sensory evaluation was done by providing gari samples to panelists used to eating it as a meal. Samples were given to them in tasting booths in such a way that there would not be interference in their evaluation.

Drinking water was also provided for the panelist to rinse their mouth. Ten panelist were used and analysis

Table 1: Nutrient composition of gari sampled from eight factories

Factory	Nutrient composition (%)									
	Crude protein	Fat	Crude fibre	Ash	Ca	P	Fe	Mg	Na	K
Ogodo orita challenge	1.40 ^{ab}	0.40 ^b	2.30 ^b	2.11 ^{a-c}	0.22 ^d	0.080 ^{ab}	0.0023 ^{a-c}	0.0017 ^b	0.13 ^{ab}	0.08 ^{ab}
Orita challenge	1.39 ^b	0.39 ^b	2.40 ^a	2.07 ^{bc}	0.21 ^e	0.076 ^a	0.0018 ^c	0.0091 ^{ab}	0.14 ^a	0.04 ^b
Apata agbekoya	1.30 ^c	0.40 ^b	2.31 ^b	2.22 ^{ab}	0.22 ^d	0.077 ^{ab}	0.0091 ^c	0.0021 ^{ab}	0.12 ^{ab}	0.06 ^{ab}
Apata iso onigari	1.46 ^a	0.39 ^b	2.43 ^a	2.39 ^a	0.19 ^f	0.083 ^{ab}	0.0021 ^{bc}	0.0020 ^{ab}	0.14 ^a	0.07 ^{ab}
Eleyele	1.34 ^{bc}	0.44 ^{bc}	2.27 ^{bc}	2.11 ^{a-c}	0.23 ^c	0.074 ^b	0.0024 ^{a-c}	0.0023 ^{ab}	0.11 ^b	0.08 ^{ab}
Eleyele temidire	1.30 ^c	0.50 ^{ab}	2.40 ^a	1.97 ^{bc}	0.25 ^b	0.082 ^{ab}	0.0023 ^{a-c}	0.0023 ^{ab}	0.14 ^a	0.07 ^{ab}
Okoro village	1.31 ^c	0.60 ^a	2.24 ^d	2.20 ^{a-c}	0.30 ^a	0.084 ^a	0.0025 ^{ab}	0.0026 ^a	0.11 ^{ab}	0.05 ^{ab}
Army barracks	1.40 ^{ab}	0.43 ^b	2.36 ^a	1.92 ^c	0.25 ^b	0.086 ^a	0.0027 ^a	0.0026 ^a	0.14 ^a	0.10 ^a

Means in the same column having the same letter are not significantly different from each other at p<0.05

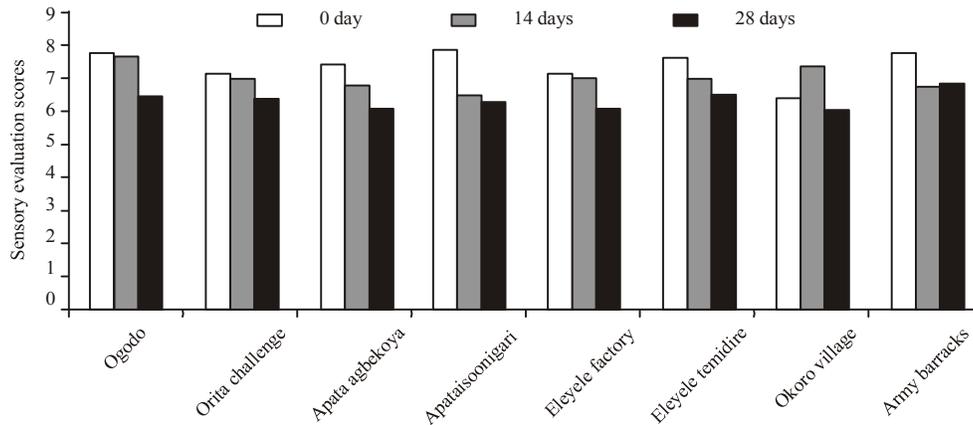


Fig. 1: Changes in the colour of gari during storage at ambient temperature

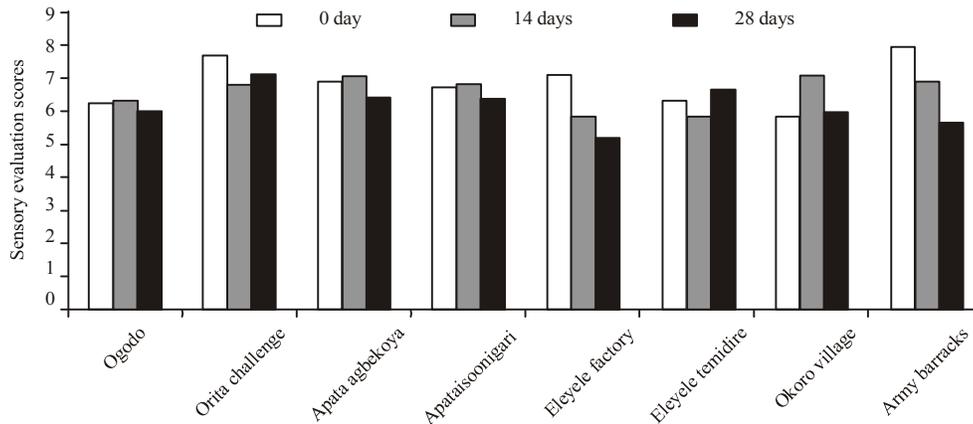


Fig. 2: Changes in the taste of gari during storage at ambient temperature

was on a nine-point hedonic scale basis (1=extreme dislike and 9=extreme likeness) [6].

Statistical analysis: All data were subjected to analysis of variance and the means were separated by Duncan Multiple Range Test [7].

RESULT AND DISCUSSION

Nutrient composition of gari from eight factories:

Table 1 shows that gari obtained from Apata iso onigari was significantly higher in protein (1.46%) and ash (2.39%) than other samples at p<0.05. Also the ether

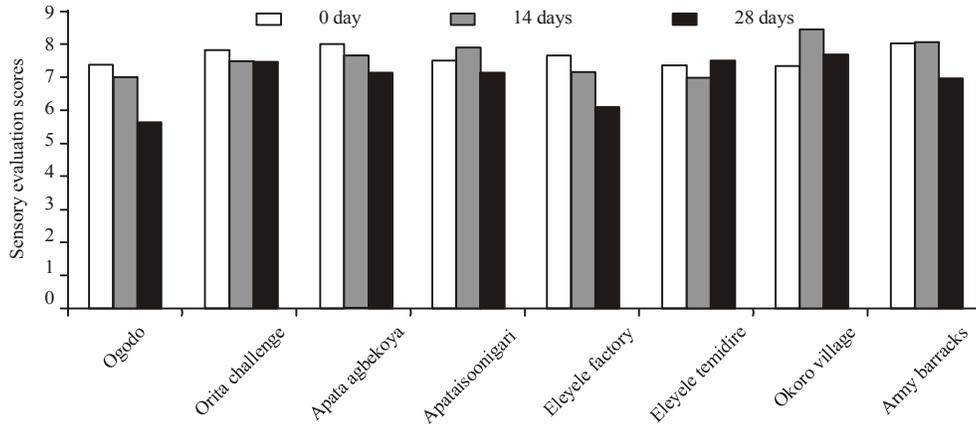


Fig. 3: Changes in the flavour of gari during storage at ambient temperature

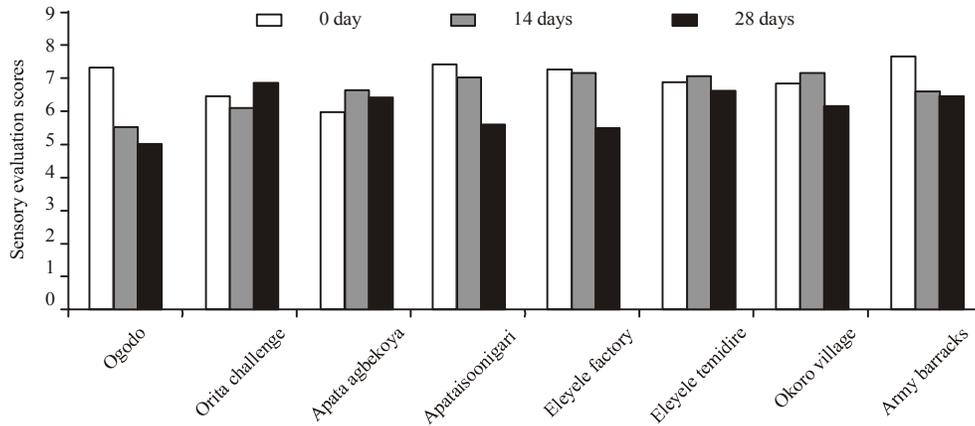


Fig. 4: Changes in the crispness of gari during storage at ambient temperature

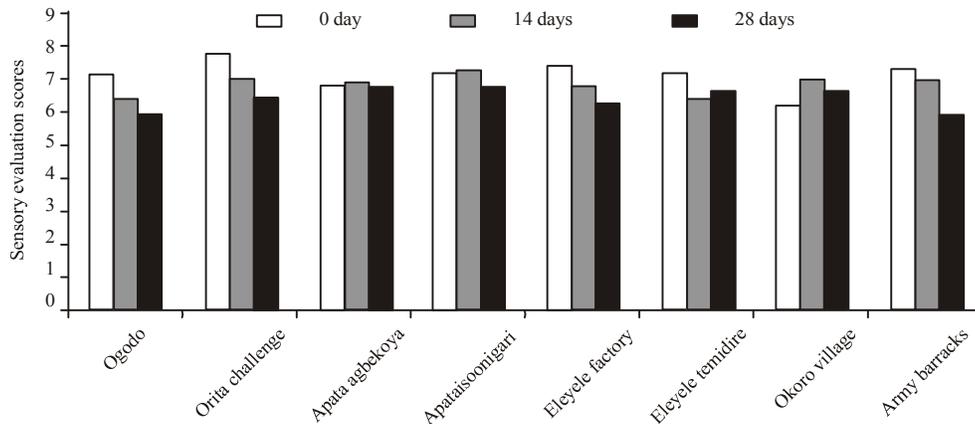


Fig. 5: Changes in the general acceptability of gari during storage at ambient temperature

extract (fat) of gari from Okoro village (0.6%) was significantly higher than other samples at $p < 0.05$. The crude fibre content of gari from Apata isoogari (2.43%), Oritá challenge (2.40%), Eleyele-temidire (2.40%) and Army barracks (2.36%) were not significantly different from each other but are significantly higher than other samples at ($p < 0.05$).

The calcium content of gari from Okoro village (0.30%) was significantly higher than other samples at $p < 0.05$. However, the phosphorus (p) contents of Okoro gari (0.084%) and Army barracks (0.086%) were not different from each other but significantly higher than other samples at $p < 0.05$. Also, Army barracks gari was rated very high in Fe (0.0027%), Mg (0.0026%) and

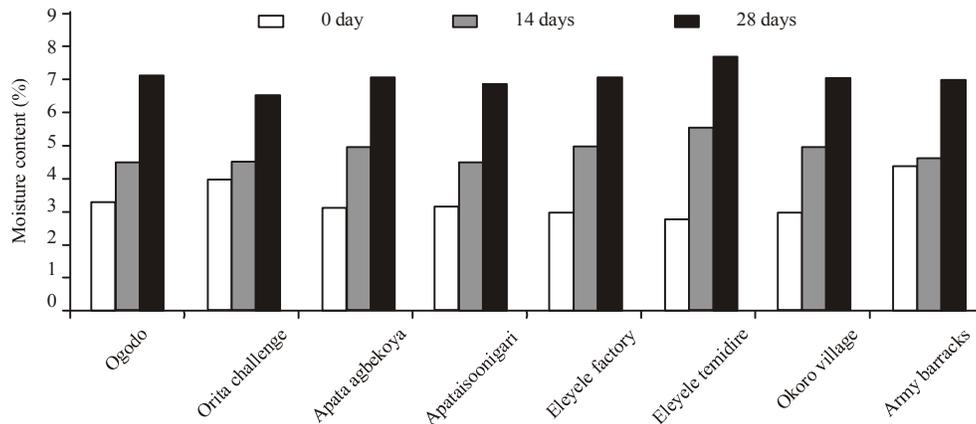


Fig. 6: Changes in the moisture content of gari during storage at ambient temperature

K (0.10%). The Na content (0.145) of gari from Apata iso onigari and orita challenge (0.114%) are not significantly different from each other.

Moisture content of gari at 0,2 and 4 weeks of storage: It was observed that there was a gradual increase in the moisture content of gari samples in the first 14 days and the range on the 14th day was between (14.25 to 14.75%) (Fig. 6).

The highest moisture content was recorded for gari obtained from eleyele Temidire (15.84%) on the 28th day of storage.

Sensory evaluation of gari at 0,2 and 4 weeks of storage at ambient temperature: Figure 1 shows that there was a decreasing trend in the sensory scores for colour of gari obtained from all the factories as period of storage increases. However higher scores were given to all the samples during the period of investigation. This same trend was noticeable in taste, flavour, crispness and general acceptability (Fig. 2-5).

It can however be deduced that all gari samples showed better quality attribute and no sample was rejected throughout the period of storage.

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