

EFFECT OF SOAKING PERIOD ON PROXIMATE COMPOSITION AND CONSUMER ACCEPTABILITY OF OGI PRODUCED FROM SELECTED CEREALS

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Abstract

‘Ogi’ is often dried with the aim of prolonging its shelf life and makes it readily available. Its sensory evaluation with respect to processes are necessary in understanding the functional behaviors and processing condition. This study therefore, examined the effect of soaking period (12, 24, 36 and 48 hours) on proximate composition and consumers acceptability of Ogi produced from three different cereals (maize, millet and sorghum). The cereals were thoroughly cleaned by blowing, sorted and washed. 3kg of each samples of cereals were soaked in water at different periods (12, 24, 36, 48) hours. The grains were rinsed and wet milled using a plate mill. The paste obtained was sieved through a muslin cloth with fine aperture and allowed to sediment. The drained Ogi was dried in the oven at temperature 50°C. The dried Ogi granules were then milled and sieved to obtain fine Ogi powder. The Ogi powder obtained was analyzed for proximate composition and consumer acceptability was also carried out. The proximate and sensory parameters (taste, colour, texture, aroma and overall acceptability) examined showed significant differences ($P < 0.05$) among three cereals evaluated. This implied that, soaking period had a significant effect on consumers acceptability of Ogi produced from the various cereals. The highest consumers acceptability were achieved at 48hr, 36hr and 36hr for Maize, millet and Sorghum respectively.

Keyword: Ogi; proximate Composition; Soaking period; Consumer Acceptability.

Introduction

‘Ogi’ (Pap) is a common West African staple food from cereals such as maize, sorghum, millet, among others. It is the product obtained from fermentation of cereals. The process essentially consisted of soaking the cereals in water for several days. The softened cereals are washed and wet milled and sieved to remove parts of the hull (Bolaji *et al.*, 2014). The commercial manufacture of ‘Ogi’ does not differ substantially from the traditional method, modification had been introduced and this includes dry milling of cereals into a flour and subsequent inoculation of the flour. ‘Ogi’ is a fermented product usually from maize grown in all parts of Nigeria. According to (Bolaji, *et al.*, 2011), the shelf life of wet Ogi is less than seven days at room temperature except when the sour water is regularly decanted and replaced with fresh water. ‘Ogi’ could be dried and packaged in polythene bags to enhance increase in shelf life. If Ogi is dried with the aim of prolonging its shelf life and readily available, its sensory evaluation with respect to processes will be necessary to understand the functional behaviors and processing condition. Therefore, this research work aimed at determining

the effect of soaking period on proximate composition and sensory evaluation of ‘Ogi’ produced from maize, millet and sorghum

Materials and Methods

The materials used in the production of Ogi are: millet, maize and sorghum. The equipment used includes; Big wide bowls, Small bowls, milling machine, muslin cloths and sieves.

Sample Collection and Preparation

White maize (*Zea mays*), Sorghum (*Sorghum bicolor*) and Millet were bought from local market (Towobowo) in Igboora, Oyo State, Nigeria. The cereals were thoroughly cleaned by blowing, sorted and washed. 3kg of each samples were soaked in water at different soaking periods of 12, 24, 36 and 48 hrs. The grains were then rinsed and wet milled using a plate mill. The paste obtained was then sieved through a muslin cloth with fine aperture and then allowed to sediment. The drained sorghum Ogi was dried in the oven at temperature 50°C. The dried Ogi granules were then milled and sieved to obtain fine powder. The Ogi powder were sealed in a air tight plastic bag

prior to subsequent analysis. 0.2kg of powdered Ogi produced from the three cereals were pre-mix with cold water and thoroughly homogenized, then the mixture were added with hot water (100°C) in uniform proportion across the samples and thoroughly homogenized using spoon.

Analytical Procedures

Proximate composition was determined using standard methods of AOAC, (2010).

Sensory Evaluation Procedure

After the Ogi had been prepared into thick paste then it was served hot in a white disposable cup labeled randomly and water was provided for mouth rinsing between samples. An independent sensory evaluation of the composite Ogi samples was carried out by ten

(10) panelists who are very familiar with the product and were selected by simple random sampling techniques comprising staff of Oyo State College of Agriculture and Technology, Igboora. The parameters determined were color, aroma, texture, taste and overall acceptability using hedonic scale, the method employed was questionnaire which was distributed to the panelists, the questionnaires consisted of nine points (9) grading scale ranging from like extremely to dislike extremely.

Statistical Analysis

Results were statistically analyzed using analysis of variance (ANOVA) and the level of significance within mean were calculated using Minitab 18 software at $p < 0.05$.

Result and Discussion

Result

Table 1: Proximate Composition of Ogi Produced from Maize

Soaking period (hrs)	Moisture	Protein	Fat	Fibre	Ash	Carbohydrate
12	8.590±0.147 ^a	9.110±0.020 ^a	3.210±0.120 ^a	4.123±0.049 ^a	1.977±0.015 ^a	75.517±0.166 ^d
24	8.063±0.306 ^b	8.763±0.025 ^b	2.716±0.379 ^b	3.796±0.162 ^b	1.763±0.100 ^b	76.303±0.051 ^c
36	6.840±0.557 ^c	8.297±0.040 ^c	2.470±0.113 ^c	3.160±0.105 ^c	1.460±0.026 ^c	76.953±0.021 ^b
48	5.97±0.100 ^d	6.367±0.155 ^d	1.857±0.035 ^d	2.460±0.026 ^d	1.343±0.025 ^c	77.907±0.064 ^a

Values on the same column having the same superscript letters are not significantly different ($p > 0.05$).

Table 2: Proximate Composition of Ogi Produced from Millet

Soaking period (hrs)	Moisture	Protein	Fat	Fibre	Ash	Carbohydrate
12	7.207±0.110 ^a	10.913±0.116 ^a	3.653±0.115 ^a	2.743±0.110 ^a	2.500±0.226 ^a	63.657±0.120 ^d
24	6.847±0.117 ^a	10.407±0.332 ^b	2.840±0.171 ^b	2.743±0.110 ^a	2.433±0.110 ^a	64.180±0.123 ^c
36	6.417±0.208 ^b	9.770±0.095 ^c	2.453±0.085 ^c	1.883±0.021 ^b	1.883±0.021 ^b	65.897±0.031 ^b
48	5.790±0.177 ^c	7.930±0.026 ^d	2.163±0.025 ^c	1.890±0.030 ^b	1.890±0.030 ^b	66.888±0.095 ^a

Values on the same column having the same superscript letters are not significantly different ($p > 0.05$).

Table 3: Proximate Composition of Ogi Produced from Sorghum

Soaking period (hrs)	Moisture	Protein	Fat	Fibre	Ash	Carbohydrate
12	11.653±0.035 ^a	12.317±0.006 ^a	2.950±0.020 ^a	5.180±0.061 ^a	2.093±0.025 ^a	77.177±0.035 ^d
24	8.087±0.015 ^c	10.890±0.010 ^b	2.463±0.031 ^b	4.820±0.027 ^b	1.870±0.020 ^b	77.453±0.035 ^c
36	9.947±0.035 ^b	9.243±0.015 ^c	2.157±0.035 ^b	4.590±0.060 ^c	1.167±0.025 ^c	77.643±0.021 ^b
48	7.573±0.095 ^d	7.867±0.032 ^d	1.801±0.021 ^c	4.207±0.021 ^d	0.887±0.015 ^d	78.920±0.044 ^a

Values on the same column having the same superscript letters are not significantly different ($p > 0.05$).

**Table 4 Sensory Evaluation of Ogi Produced from Maize**

Soaking period (hrs)	Characters considered from the evaluation				
	Taste	Colour	Aroma	Texture	Overall acceptability
12	3.900±0.994 ^b	5.100±0.994 ^b	5.700±1.494 ^c	4.200±1.317 ^c	3.700±0.949 ^c
24	5.800±0.919 ^c	6.60±0.843 ^a	6.000±0.816 ^{bc}	5.600±0.966 ^b	6.100±0.994 ^b
36	6.900±0.876 ^d	7.000±0.816 ^a	7.300±1.337 ^{ab}	6.700±0.949 ^{ab}	7.000±0.816 ^b
48	8.000±0.816 ^a	7.500±1.080 ^a	7.800±0.789 ^a	7.900±0.738 ^a	8.400±0.699 ^a

Values on the same column having the same superscript letters are not significantly different ($p>0.05$)

Table 5 Sensory Evaluation of Ogi Produced from Millet

Soaking period (hrs)	Characters considered from the evaluation				
	Taste	Colour	Aroma	Texture	Overall acceptability
12	6.000±0.816 ^c	5.300±0.823 ^{bc}	5.900±0.738 ^b	5.900±0.738 ^b	5.900±0.944 ^b
24	6.900±0.738 ^b	6.100±0.738 ^b	7.000±0.816 ^a	7.200±0.919 ^a	6.500±0.972 ^b
36	8.500±0.527 ^a	8.200±0.789 ^a	7.800±0.919 ^a	8.000±0.816 ^a	8.400±0.699 ^a
48	4.100±0.738 ^b	4.800±0.789 ^c	5.200±1.033 ^b	3.300±0.949 ^c	4.400±0.966 ^c

Values on the same column having the same superscript letters are not significantly different ($p>0.05$)

Table 6 Sensory Evaluation of Ogi Produced from Sorghum

Soaking period (hrs)	Characters considered from the evaluation				
	Taste	Colour	Aroma	Texture	Overall acceptability
12	6.100±0.738 ^b	6.300±1.059 ^b	5.600±0.699 ^b	6.100±0.738 ^c	5.700±0.823 ^c
24	8.200±0.789 ^a	7.900±0.994 ^a	8.100±0.738 ^a	8.700±0.483 ^a	8.700±0.423 ^a
36	7.200±0.632 ^{ab}	7.200±1.033 ^b	7.300±0.675 ^a	7.500±0.850 ^b	7.400±0.699 ^b
48	4.600±0.843 ^c	5.000±1.054 ^c	4.200±1.299 ^c	4.700±1.160 ^d	3.700±0.949 ^d

Values on the same column having the same superscript letters are not significantly different ($p>0.05$)

Discussion

The proximate composition of Ogi flour produced from maize, millet and sorghum at different soaking periods were presented in table 1, table 2 and table 3 respectively. The moisture content of Ogi powder produced from maize ranged from 5.970% to 8.59%, millet ranged 5.790% to 7.207% and Ogi produced from sorghum ranges from 7.537% to 11.653%. The higher moisture contents were recorded in samples soaked for 12hr for all the cereals considered in this study while lowest values were recorded in samples soaked for 48hr. There were decrease in moisture content with increase in the soaking periods. Low moisture values obtained in the cereals showed that Ogi powder would have longer shelf life thereby preventing deterioration (Makanjuola and Makanjuola, 2012). The protein values of Ogi powder obtained from this study for maize was lower when compared with those reported by Olorunjuwon *et al.*, (2018) while those recorded for millet and sorghum were higher than those values reported. The higher

value obtained from this study for sorghum and millet could be attributed to decrease in soaking period as against 96hrs reported by Olorunjuwon *et al.*, (2018). The fat contents showed significant difference ($P<0.05$) among samples evaluated. The result obtained ranged from 2.470% to 3.210%, 2.453% to 3.653% and 1.801% to 2.959% for maize, millet and sorghum respectively. From the result, it was observed from the three cereals samples that the fibre and ash contents decreases with increase in soaking period while carbohydrate contents increase as the soaking period increased. There was significant difference ($p<0.05$) in the fibre, ash and carbohydrate contents of the Ogi powder produced from maize, millet and sorghum.

At the end of the Sensory Evaluation, the result obtained were analyzed using analysis of variance (ANOVA) and the level of significance within means were calculated as presented in table 4, 5 and 6 for maize, millet and sorghum respectively. The sensory parameters (taste, colour, texture, aroma and overall

acceptability) examined showed significant difference ($P < 0.05$) among three cereals evaluated. This implied that, soaking period had a significant effect on consumers acceptability of Ogi produced from maize, millet and Sorghum. The highest means of consumers acceptability were achieved at 48hr, 36hr and 36hr for Maize, millet and Sorghum respectively.

Conclusion

This study revealed that Ogi produced from maize, millet and sorghum can be processed into powder form to improve the shelf life of the product. The effect of soaking period on proximate composition and consumers acceptability considered on the three cereals for the production of Ogi. It was observed that, there was significant difference ($P < 0.05$) among three cereals evaluated on proximate composition and sensory evaluation of the characters examined. However, further studies should be carried out to examine the storage period of the product as it affects the proximate composition and consumers acceptability.

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