

Rheological Properties and Consumer Acceptance of Moin-Moin Premix

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ABSTRACT

Premix was prepared from cowpea flour, pepper powder and onion powder. Pasting characteristics of the cowpea flour as affected by addition of other ingredients were investigated. The consumer acceptability of the premix for preparation of moin-moin was also investigated. Gelatinisation temperature of bean flour was significantly ($p=0.05$) increased by inclusion of pepper but not by inclusion of onion powder. Viscosity of the premix was not

significantly affected, except the set back value, which was significantly lowered. Moin-moin from premix compared favourably with the control sample in all attributes except texture, which was rated lower.

Key words: Premix, rheology, moin-moin ingredients

INTRODUCTION

“Moin-moin” is a popular West African steamed cowpea product that has potential for utilization in other parts of the world (Lasekan *et al.*, 1987). “Moin-moin” is obtained from cowpea paste flavoured with pepper, onion, vegetable oil and salt. Thorough mixing of the slurry is usually done to obtain stable emulsion of the paste and the oil, thus preventing their separation during steaming. The traditional method of preparing fresh cowpea paste from cowpea seeds is labour intensive and time consuming (Olapade *et al.*, 2002; Dovo *et al.*, 1976). The availability of ready-to-use cowpea flour for preparation of this common cowpea dish could eliminate the problems associated with the traditional method of preparing fresh cowpea paste. Cowpea flour has been reported to produce moin-moin with optimum organoleptic qualities (Ngoddy *et al.*, 1986). The popularity of formulated convenience foods places greater emphasis on the reliability of functional properties of the ingredients (Desphande *et al.*, 1982). Novel foods and food ingredients such as cowpea flour must be functionally reliable if they are to be accepted for use. Functionality is defined as any

property of a food or food ingredient other than the nutritional ones that affects its utilization (Pour-El, 1981). In the previous work, it was considered necessary to incorporate other required ingredients to cowpea flour in form of premix to further reduce time and effort that would be input by the end-user of the cowpea flour (Olapade *et al.*, 2004). The effects of added ingredients were studied as they affected functionality of cowpea flour in preparation of akara (a fried cowpea product). The objective of this work is to investigate effects of added ingredients on pasting and other rheological properties of the cowpea flour and the consumer acceptance of the “moin-moin” prepared from the premix.

MATERIALS AND METHODS

Preparation of cowpea flour:

Cowpea seeds, pepper (fresh and powder), onion (fresh and powder), vegetable oil (Kings brand) and mono sodium glutamate seasoning (A-one brand) were all purchased from local markets within Lagos State. The seeds were manually cleaned to remove impurities such as chaffs and stones. The clean seeds were dehulled and milled as described by Olapade *et al.* (2004).

Formulation of premixes

200g cowpea flour (C) was weighed into four places, 5g pepper powder was added to one (CP), 5g onion powder was added to the second (CO), 5g each pepper and onion powder were jointly added to third sample (CPO). The mixtures were separately blended for 2min in a dry food blender (Moulinex), then packaged in moisture-proof polyethylene bags and stored under refrigeration (4°C) for further analysis.

Pasting characteristics of cowpea flour and premixes

Pasting characteristics of the samples were determined using an Amylograph equipment (Brabender, Germany). About 45g-meal sample and 450ml distilled water was stirred into slurry in a beaker. The slurry was then poured in the Brabender cup and heated at a rate of 2.5°C per minute from 30°C. The slurry was heated to 95°C, maintained at that temperature for 15min, then cooled at a rate of 2.5°C per min to 50°C and held for 15min. The parameters such as peak viscosity, viscosity at 95°C, viscosity at 95°C after 15min., viscosity at 50°C and gelatinisation temperature were obtained from the graph.

Preparation of moin-moin

"Moin-moin" was prepared from cowpea flour and the premix according to recipe and method of Dovlo *et al.*, (1976). Also control "moin-moin" was prepared from fresh cowpea paste prepared according to the method described by Dovlo *et al.*, (1976).

Sensory evaluation of "moin-moin"

Prepared samples of "moin-moin" were presented

to 20-member panel of judges, who are familiar with "moin-moin" for sensory evaluation. The attributes evaluated were colour, taste, texture, flavour and overall acceptance. Nine point Hedonic scale was used to score the samples, where 9 represents extremely like, and 1 represents extremely disliked.

Statistical analysis:

Data obtained were subjected to analysis of variance and the samples' means were separated using Duncan's multiple test procedure (Duncan 1955).

RESULTS AND DISCUSSION

Amylograph pasting characteristics of the premixes and cowpea flour are presented in Table 1. Inclusion of pepper and onion separately or jointly resulted in appreciable changes in gelatinization temperature of the cowpea flour (72°C). The pasting temperatures observed were close to the pasting temperature (80°C) of fresh cowpea paste reported by Henshaw *et al.* (2002). Peak viscosity values were not significantly different for the samples but viscosity values at 95°C were appreciably affected. Set back value, a measure of the retrogradation tendency of starch products, was lowest for premix CPO (50Bu) whereas it was highest for cowpea flour (160Bu). Pasting index value, a measure of consistency, was highest for premix CO and lowest for premix CPO. These results contrasted the observation of Akinjayeju (2002), that reported that bean flours produced amylograph pasting curves characterized by restricted swelling.

Table 1: Means, pasting characteristics of premixes^{1,2}

Sample	Pasting Temp. (°C)	Peak Visc. Vp (Bu)	Visc. at 95°C (Bu)	Viscosity at 95°C after 15min (Bu)	Visc. at 50°C Vc (Bu)	Set back value at (Vc-Vp) (Bu)	Pasting index (Vc-Vr) (Bu)
Cowpea flour	72 _b	340 _a	340 _a	385 _a	500 _a	160 _a	115 _b
Cowpea flour and onion (CO)	79 _{a b}	345 _a	300 _b	300 _b	480 _{a b}	135 _{a b}	180 _a
Cowpea flour and pepper (CP)	82 _a	310 _a	280 _b	305 _b	420 _b	110 _b	115 _b
Cowpea, pepper and onion (CPO)	82 _a	330 _a	330 _a	270 _b	380 _c	50 _c	110 _b

¹ Mean of three replicates² Mean with the same subscripts in a column are not different (p=0.05)

Bu- Brabender unit

Visc.- Viscosity

The results of sensory evaluation of samples of moin-moin from different sources are presented in Table 2. "Moin-moin" prepared from both cowpea flour and the premix compared favourably with the control sample from fresh paste in all attributes. No significant difference was observed among the means (p=0.05). Except for texture in which the premix sample was lower in rating than the control, other attributes were equally rating with the control. The lower rating of the texture

of the premix could be attributed to lower set back value as revealed by amylograph test (Table 1). Set back value is a measure of the retrogradation tendency of starch products. The results obtained, nevertheless, corroborated the observations of earlier workers that cowpea flour produced acceptable "moin-moin" (Ngoddy *et al.*, 1986; Lasekan *et al.*, 1987) with optimum organoleptic properties.

Table 2: Mean sensory scores of samples of moin-moin^{1,2}

Sample from	Colour	Taste	Texture	Flavour	Overall acceptance
Fresh paste	8.3 _a	8.6 _a	8.2 _a	8.6 _a	8.8 _a
Cowpea flour	7.8 _a	7.9 _a	7.9 _a	8.1 _a	8.4 _a
Premix (CPO)	8.0 _a	8.2 _a	7.0 _b	8.3 _a	8.2 _a

¹ Mean of three replicates² Mean with the same subscripts in a column are not different (p=0.05)

CONCLUSION

The investigation on pasting characteristics and acceptability of "moin-moin" prepared from the premix has revealed that inclusion of other ingredients did not significantly affect the performance of the premix in the preparation of "moin-moin".

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