EFFECT OF COWPEA FLOUR PARTICLE SIZE AND ITS DISTRIBUTION ON CHARACTERISTICS OF AKLA

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INTRODUCTION

'Akla' (fried cowpea paste) a favourite snack food in Ghana, requires for its preparation, the whipping of cowpea batter until light for frying. Certain characteristics are preferred for good quality Akla, among these are compact inner texture, sponginess, external crispness and crunchiness. The mechanically produced cowpea flour coded DMED (O) was assessed for these qualities.

Method

Cowpea grains purchased from the local market were cleaned and milled using screens attached to the Hammer Mill which are designated as 2/64 (Fine) 3/64 (Medium) and 4/64 (Coarse). From the screens, the flours were passed through replaceable mesh sieves that have different aperture dimensions defined as 250, 430, 600 and 850 microns. The Simon Sifter on the mill has four screens with pore size dimensions designated as: 40 GG (475 microns) 10XX (129 microns) 11XX (117 microns) 12XX (112 microns) and the collector wooden basin (below 112 microns). The sifter has a shaker device which when in operation, causes the flour particles to be separated onto the various screens. The uniformity among the Ohawu flours were expressed in three classes as: DMED (O) Coarse, Medium and Fine, depending on the mill screen used. These samples were sifted into the various particle sizes using the Simon sifter to determine the particle size composition of the flours. (Table I)

TABLE I

Particle Size Composition of Ohawu Flour (2)

TYPE	Percentage Through			
	40 GG 475 Microns	10XX 129 Microns	11XX 117 Microns	12XX 112 Microns
DMED(0) Coarse	64.2	61.8	51.2	21.8
DMED(0) Medium	67.1	65.0	57.2	25.2
DMED(0) Fine	73.5	69.6	62.6	23.3

Traditionally processed flours

Samples of traditionally processed flours were obtained from local Akla processors to use in comparison with the mechanically dehulled flours. The market samples were coded SMAD (L)[1] and their particles size composition determined. (Table ?)

Akla Preparation and Ink Blots

100 grams of each flour sample was made into paste with 140 ml of water. This was whipped for 15 minutes to homogeneity. Using speed 2 of a Kenwood mixer. The resulting batter was fried into balls in hot vegetable oil at 190° till golden brown, taking 5 minutes. Ink blots were prepared from horizontal sections of each Akla sample and internal characteristics observed. (Fig. 1-7).

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[1] SMAD (L) - Soaked Manually Dehulled.

TABLE 2 Particle Size Composition of Traditionally Processed Cowpea Flours (3)

SAMPLES	Percentage Through			
	40 GG 475 Microns	10 XX 129 Microns	11 XX 117 Microns	12 XX 112 Microns
SMAD (L) 1	96.8	48.4	24.1	9.1
" 2	94.2	44.9	31.4	13.9
" 3	95.5	53.0	32.8	22.5
" 4	97.6	49.8	36.6	14.4
Av.	96.0	49.0	31.2	14.7

The top four blots (Fig.1-4) show characteristics of the market samples. Fig 5-7 show those of the mechanically dehulled flours, DMED (O) Fine, Medium and Coarse respectively.

Discussion

The air spaces in Fig.1, have been marked at the boarders with particles closely packed in the product. In Fig.2, the air spaces were pronounced internally. Fig.3 had several air spaces and in Fig.4 the air spaces were internally diffused with a few at the boarders. The DMED (O) Fine (Fig.5) show good degree of compactability with a few air spaces. The same was observed for DMED (O) Medium and Coarse. (Fig.6 & 7) both of which had less air spaces in the products.

On the whole, the product from DMED (O) Medium was adjudged the best for its quality.

The results show that the finer the cowpea flour, the more abundant and dispersed the air spaces in the product. And the more the air spaces, the lighter the Akla. Such a product is less satisfying. The products from the Ohawu flours were compact with less air spaces. (Fig.5-7) and therefore have greater satiety value.

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