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CHARACTERISTICS OF TRADITIONAL MAIZE PRODUCTS

USED IN GHANA

by

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USED IN GHANA

Maize is the principal cereal cultivated in Ghana and is consumed in every part of the country, most especially in the coastal southern regions. Local varieties of maize are white dent. Introduced high yield varieties mostly dent, are also widely cultivated in Ghana. Yellow maize is cultivated and consumed mainly in the Northern and Upper regions of the country where maize is generally used as a substitute for sorghum or millet when these two cereals are scarce.

Milling of whole maize products

Figure 1 shows the different stages of preparing various whole maize products in Ghana. Three main techniques are employed.

- (i) After cleaning, the grain is roasted before it is ground into a brown coloured whole meal called ablemamu.
- (ii) Cleaned maize is finely ground into a whole meal.
- (iii) The grain is cleaned, steeped in water for 1 - 2 days, ground and made into a dough. This is left to ferment for 1-3 days, during which time a sour flavour is developed. The wholemeal as prepared in (ii) may also be made into fermented dough.

Milling of dehulled maize products

As shown in Figure 2, maize is cleaned and dehulled either by pounding or in disc decorticators. The grain obtained may be used as such or it is further processed in the following ways.

FIG I PREPARATION OF WHOLE MAIZE PRODUCTS

IN GHANA

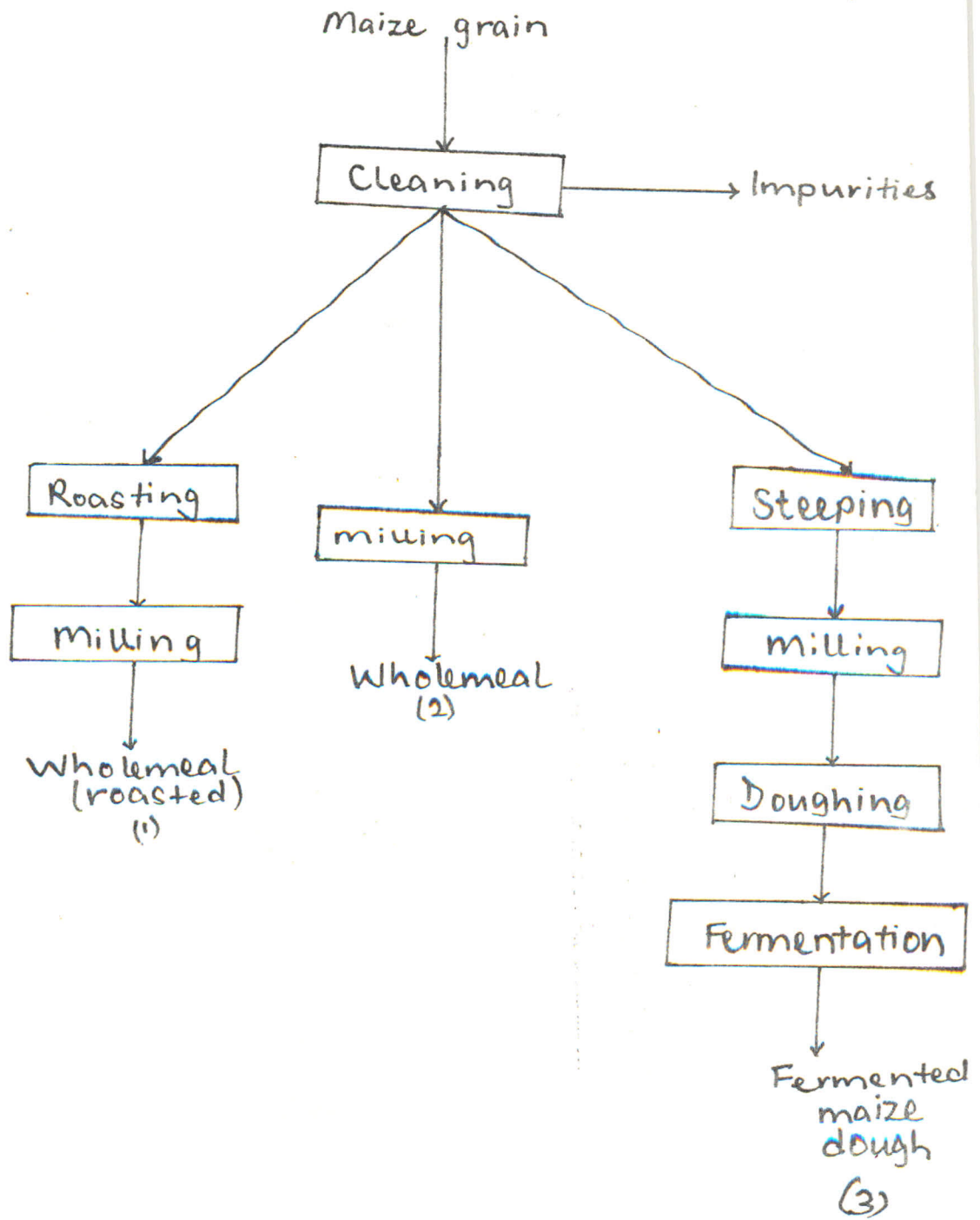
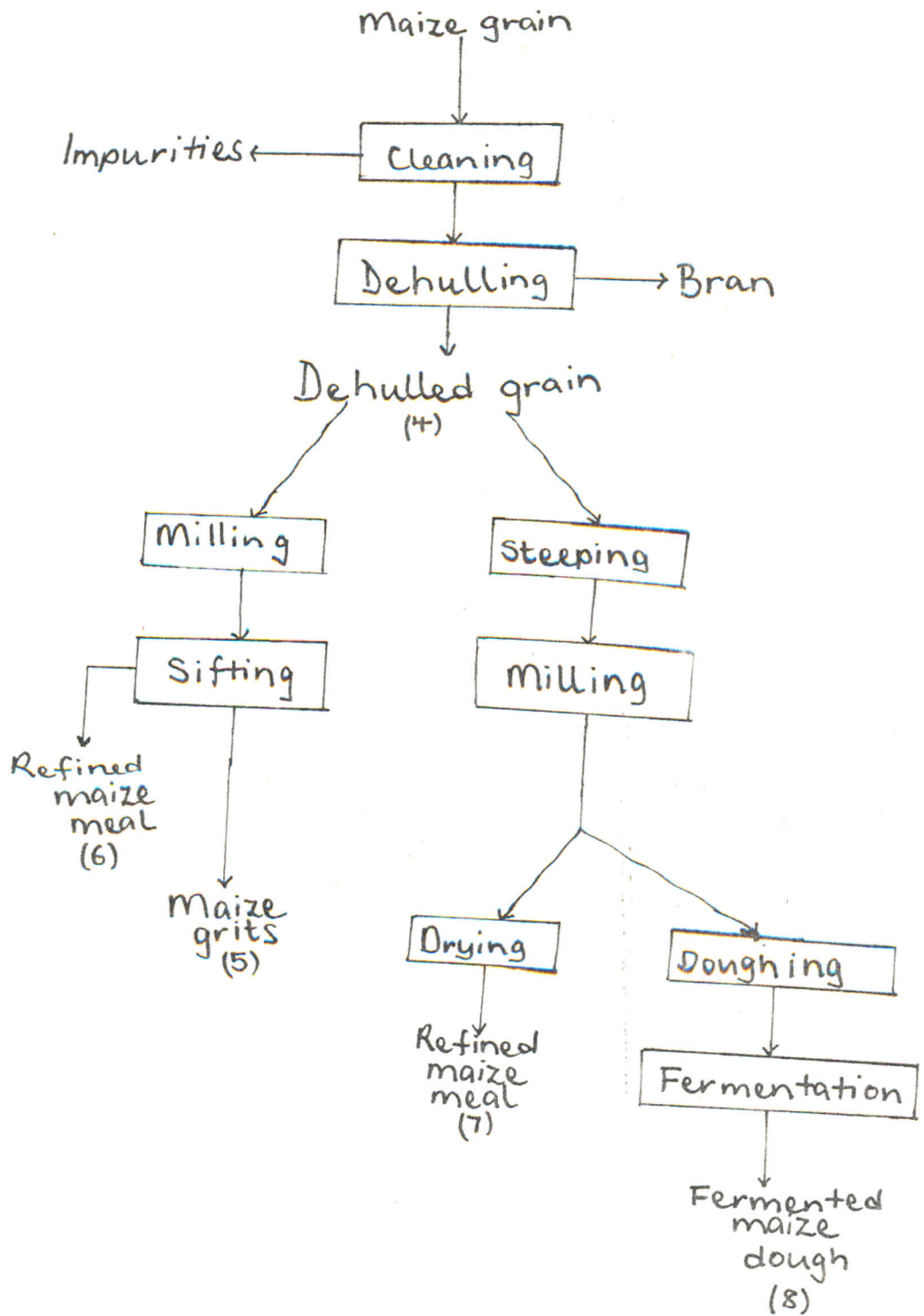


FIG 2. PREPARATION OF DEHULLED MAIZE PRODUCTS

IN GHANA



- (i) It is coarsely ground and sifted to separate the grits from the meal.
- (ii) The dehulled grain is steeped for 1 - 2 days before it is finely ground in attrition mills. The moist meal with a moisture content of about 22% is sun-dried before it is sold on the markets.
- (iii) After steeping and grinding as described above, the meal is made into a fermented dough.

#### Characteristics of maize Products

Table 1 shows the results of sieving analysis of milled products. The particle sizes of the various products are: dehulled maize grain, 4000 - 5660 micron; maize grits, 420 - 840 micron; dehulled maize meal and whole maize meal, 297 - 420 micron and roasted maize meal, 177 - 420 micron.

The proximate chemical composition of Ghanaian maize products is shown on Table 2. The ash content of dehulled products is quite low ranging from 0.1% to 0.3%. Fat content is high in products which contain the whole grain (3.4 - 5.2%). Storage studies carried out in Ghana indicated that due to high fat content, wholemaize meal (unroasted) develops rancidity and off flavour after two weeks.<sup>(1)</sup>

Lactic acid bacteria are reported to be responsible for the fermentation of maize dough.<sup>(2)</sup> At the peak of fermentation, the dough has a pH value of 3.5 - 4.5. Moisture content of maize dough is about 45%. With the exception of roasted maize meal which is light brown in colour, all other products are white.

Uses of maize

Fermented maize dough is an important intermediate product from which a variety of staple dishes are derived. These include kenkey, banku, akple and akasa.

Kenkey is the principal dish that is made from maize in Ghana. It is prepared from fermented maize dough. The dough is divided into 2 portions. One portion is cooked and mixed with the uncooked portion. The mixture is made into balls which are wrapped in dried plantain leaves or maize husks and boiled. Different types of kenkey are made in different parts of Ghana. Kenkey may be prepared from wholemeal dough or dough from dehulled grain. It is flavoured in certain areas with salt and in others with sugar.

Banku or akple are thick smooth pastes made by boiling maize meal (unroasted) or fermented maize dough. Akasa is a general name given to different thin porridges prepared from the various maize meals and from fermented maize dough.

Roasted maize meal is cooked in palm soup into a thick mass called aprapransa. This dish may contain beans and fish and is eaten as a complete meal. A thin gruel is prepared by steeping dehulled maize grain over-night followed by boiling. The grain may also be wrapped in corn husks after steeping and boiled until soft. It is eaten with boiled groundnuts or pieces of mature coconut flesh. Maize grits is used as a substitute for rice to prepared a dish similar to boiled rice. This dish is called eburwmo which means "maize rice". A thin gruel is also made from the grits.

Each of the different types of maize meal or fermented dough may be mixed with pounded ripe plantain to prepare a number of sweet dishes which are either fried or baked.

Potential for industrial production

Provided the moisture and fat contents are kept low, maize meals are capable of storing for months if they are well packaged. Products with low fat content such as maize grits and the meal prepared from dehulled grain have the potential to be produced on industrial scale provided the local raw material source is sufficient to support a large scale operation. Similar products are already being produced on industrial scale in Zambia.

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Table 1

SIEVING ANALYSIS OF MILLED MAIZE PRODUCTS  
(Percent weight retained)

Aperture size of Sieve (micron)	MILLED PRODUCTS				
	Dehulled maize (4)	Maize grits (5)	Maize meal (dehulled) (7)	Whole maize meal (roasted) (1)	Whole maize meal (2)
5660	8				
4000	65				
2000	26.5				
1410	0.6	1			
840		26.5	0.2	0.2	0.6
420		64.5	5.6	1.7	13.2
297		8.2	63.9	56.6	54.5
177			24.0	33.3	26.4
105			5.6	6.2	4.1
< 105			0.8	2.3	1.2

Source: Unpublished data

(1), (2), (4), (5), (7) refer to products as indicated  
on Figures 1 & 2.

Table 2

PROXIMATE COMPOSITION OF GHANAIAN MAIZE PRODUCTS  
(D.W.B. (unpublished data))

Products	Protein (N x 6.25)	Fat %	Ash %	Fibre %
Maize grain	9.6	3.4	1.5	
Dehulled maize <sup>(4)</sup> grain	8.8	2.0	0.2	
Maize grits <sup>(5)</sup>	9.4	1.4	0.2	
Maize meal <sup>(6)</sup> (dehulled)	7.7	2.2	0.3	
Maize meal + <sup>(7)</sup> (dehulled)	9.6	0.1	0.1	0.5
Whole maize + <sup>(2)</sup> meal	10.2	4.3	1.2	2.9
Whole maize* <sup>(1)</sup> meal (roasted)	9.8	5.2	1.7	1.3

\* Eyeson and Ankrah (1975)

+ Andah (1976)

(1), (2), (4), (5), (6), (7) refer to products as indicated on  
 Figs. 1 & 2.