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THE NUTRITIVE VALUE OF SOME TANGANYIKA FOODS

II—CASSAVA

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The cassava root (*Manihot utilissima*; Swahili, *muhogo*) is an important famine reserve crop in Tanganyika. A recent book on tropical nutrition assesses the nutritive value of the fresh root as follows:—

Caloric value 145 per 100 g.
Calcium .04, Phosphorus .04, Iron .001 per cent.

Vitamins A, B₁, B₂ and C—very little.

Clark has suggested that the presence of cyanogenetic glycosides in the root and leaves precipitates or causes pellagroid symptoms. In experiments on animals described in support of this statement, rats were fed on minced bitter cassava leaves, forming from three-quarters to the whole of their diet (excluding mineral supplements) and on raw and steamed cassava root. In all cases loss in weight, and in some cases death, followed. Harris and Raymond have cited evidence to show that rats excrete nicotinic acid on a nicotinic acid deficient diet, and Birch and others have shown that on a Goldberger diet rats can live without added nicotinic acid. It is thus doubtful if rats could show symptoms of pellagroid disease. Nevertheless, in view of these reports we decided to investigate the place of the cassava plant, both root and leaves, in East African diets, paying particular attention to the presence in it of cyanogenetic glycosides.

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A—THE ROOT

The importance of cassava as a food crop in East Africa lies in the fact that, unlike sweet potatoes, the other common tuber, it is not seasonal.

The root is used by Africans in at least four ways:—

- (1) Raw in small quantities as a "snack" and thirst quencher; only the sweeter varieties are so used.
- (2) Boiled until tender.
- (3) Roasted.
- (4) In the dried form as flour to replace maize and other cereals.

The place of the cassava root in African nutrition is thus twofold: first as a supplement of the tuber type replacing sweet potatoes, and secondly, as a staple. Though a great deal of attention has been paid to this second use, and we are satisfied that in this form it is less nutritious than other staples such as maize or rice, less appears to have been paid to its use as supplement.

The relatively high indophenol titration given by the fresh root attracted our attention, and so far as we are aware this is the first report of the presence of vitamin C in the root; the mean value obtained from several varieties of differing degrees of freshness being 30 mgm. ascorbic acid per 100 grams of root.

We sought confirmation of this result by preparing qualitatively the 2:4 dinitrophenylhydrazone and by feeding experiments on guinea pigs who were given 1.8 gm. of the fresh root daily, corresponding to .54 mgm. ascorbic acid, their minimum requirements being generally accepted as 0.5 mgm. The results of this experiment are shown in Table I.

TABLE I

Animal No.	Diet	Weight of animal in grams after days									
		0	7	17	20	22	31	38	45	61	75
1	Basal	230	225	207	182	145	Died of scurvy 22nd day.				
2	Basal	210	255	250	225	195	Ditto.				
3	Basal plus 1.8 g. fresh root ..	180	180	215	229	—	242	243	255	260	288
4	Ditto	330	302	312	333	—	313	320	338	356	360
5	Ditto	260	245	260	263	—	248	266	305	288	278
6	Ditto	240	215	260	275	—	300	345	364	360	400