

NUTRITION AND NATIVE AGRICULTURE IN EAST AFRICA

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GENERAL CONSIDERATIONS

Dr. W. D. Raymond, in his paper "Minimum Dietary Standards for East African Natives," [1] sets out very clearly the minimum amounts of the more important food substances required to maintain Africans of both sexes and of various ages at different energy levels, and the object of this paper is to translate his biochemical conclusions into terms of peasant agriculture.¹ Grateful acknowledgment is made to Dr. Raymond for permission to make use of unpublished work.

A hardworking adult male African must have about 3,400 calories a day, the bulk of which will be derived from his staple, usually maize, sorghum, pennisetum, eleusine or rice. Weight for weight, there is little to choose between these foods as energy producers, and this may account for the fact that the encouragement of one or another of them has hitherto usually depended on considerations of yield, a very important point but by no means the whole story.

In African diets the staple plays a far more important role than that of a mere producer of energy. There are many areas where at certain seasons of the year it supplies 80 to 90 per cent of the protein intake, practically all the vitamin B₁, nearly all the nicotinic acid and important amounts of other essential substances such as vitamin A, calcium and phosphorus. It is obvious therefore that although the yield to be expected from a staple is very important, in that it determines the quantity of food available, chemical composition is equally important as a measure of its quality and properties. It is sheer waste of time making two ears grow where one grew before unless the two are more valuable than the one they replace.

GRAINS

Bearing these facts in mind, let us consider briefly the relative merits of the common grains.

Maize is a high yielder with low labour costs. There are many quick-growing varieties

and also drought-resistant strains to be had. But maize is dangerous in that the white varieties—that is, almost all those grown in East Africa—are practically devoid of carotene, so that it is scarcely surprising to find vitamin A deficiency widespread among the maize-eating tribes where other foods containing vitamin A or its precursors are not extensively or regularly used. Maize is, moreover, very poor in calcium, and the biological value of its protein is low, viz. 60.

The most popular sorghums are longer maturing than maize and involve more labour, especially when it comes to scaring away the birds; but they are more drought-resistant, richer in calcium, and constitute an important source of carotene, while the biological value of their protein is said to be high, viz. 83. Pennisetum is dietetically on a par with the sorghums, and being still more drought-resistant it is a valuable crop for arid regions—sometimes the only possible one.

Eleusine is thought to be especially rich in calcium (0.2 per cent as compared with 0.007 per cent for maize²); it also contains carotene; it will grow on poor soils, and is quick maturing, but yields are poor and it needs ample water.

Rice, as everyone knows, requires special conditions. It is a tricky crop unless grown under well-controlled irrigation, but properly cultivated on suitable land it will yield more calories per acre than any other grain, and its protein is of high biological value, viz. 80. It is, however, very poor in carotene, and if highly milled loses most if not all of its vitamin B₁. The methods of storing, washing and cooking the grain are also important in respect of B₁. Long storage in sacks after hulling produces an unpleasant tasting product, needing very thorough washing before cooking, with a consequent serious loss of vitamin B₁. This is a point of importance as regards rice sold by traders, but the peasant himself normally stores it in the husk, hulling small quantities as required. Generally speaking, rice is a grain

¹ For the convenience of readers Dr. Raymond's summary of his conclusions is reprinted as an appendix to this paper.—Ed.

² Tanganyika varieties examined in the Dar es Salaam Chemical Laboratory.