

Technical Note

A Note on the Nutritive Value of Amaranth Seeds

ABSTRACT

Analysis of Amaranthus hybridus seeds shows that they contain a high amount of protein (13.1%) of high biological value. The PER (2.3) is comparable to that of casein (2.5); so also the biological value, digestibility and net protein utilisation. The tannin content (0.15%) seems to be sufficiently low to have no significant effect on the nutritional value.

INTRODUCTION

Amaranth has often been referred to as the giant of the future mainly because both the seeds and the leaves are edible. The seeds contain more lysine than any cereal and the yield is higher than that of maize and most conventional cereals. The leaves are regarded as a delicacy as they go with many traditional West African foods. However, most reports indicate that the seeds have a low Protein Efficiency Ratio (PER) in spite of the favourable amino acid composition (Afolabi *et al.*, 1981).

In Nigeria the Government has embarked on the Green Revolution Programme which aims at providing enough good food for the population and making the country self-sufficient with regard to food. In pursuance of this objective the Institute of Horticultural Research has been established and research is progressing on the different aspects of fruits and vegetables, especially amaranth. Several species of amaranth

have been selected and multiplication is going on together with tests for the fertiliser requirements, etc.

The aim of this report is to give the preliminary results of some of our work on the nutritive value of one of the varieties of amaranth that showed some promise as a good pseudo-cereal.

MATERIALS AND METHODS

The variety *Amaranthus hybridus* was collected from the UNICEF Home Garden Project in Ilesha, Nigeria and dried in the oven at 85°C for 48 h before grinding. Samples were then taken for proximate analysis and for the determination of tannin by the method of Maxson & Rooney (1972). The techniques used for the animal feeding trials were the same as those described by Umoh & Oke (1974).

RESULTS AND DISCUSSION

The proximate composition shown in Table 1 is very similar to previous results (Afolabi *et al.*, 1981), apart from a slightly higher protein content. Table 2 shows that the PER is comparable to that of casein so also the biological value (BV) and the net protein utilisation (NPU). The tannin content (0.15%) was lower than 0.25% obtained for the previous seeds.

In the paper by Afolabi *et al.* (1981) all the rats fed on amaranth seeds lost weight and hence gave a negative PER of -0.4. It was then reported that the high tannin content might be the cause. Out of several species already tested we have now been able to get one that has a nutritive value

TABLE 1
Proximate Analysis of *A. hybridus* (% of dry matter)

% Protein	13.1
Moisture	9.3
Fat	7.5
Fibre	6.8
Ash	2.0
Tannin	0.15

TABLE 2
Performance of Rats on *A. hybridus*

Sample	Average feed intake	Protein efficiency ratio	Net protein utilisation	Biological value	True digestibility
Casein	109 ± 2.8	2.5 ± 0.1	77.2 ± 2.0	80.0 ± 0.8	96.2 ± 2.8
<i>A. hybridus</i>	97.2 ± 2.3	2.3 ± 0.2	71.6 ± 1.7	77.7 ± 0.9	92.1 ± 3.0

comparable to casein. We have succeeded in making local dishes using these seeds as substitutes for millet and sorghum. Considering that the protein is much higher than any of the major cereals and with a much superior amino acid composition, amaranth could therefore become a major pseudo-cereal crop that could help to increase the protein intake in developing countries if it is accepted. It will be recalled that in tropical Africa and in many other parts, only amaranth leaves are eaten as a vegetable; the seeds are mainly used for replanting or else are wasted.

REFERENCES

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