

AMINO ACID ANALYSIS OF SWEET POTATO (IPOMOEA BATATAS) FROM THE HIGHLANDS
OF PAPUA NEW GUINEA

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About 40% of the population of Papua New Guinea live in the highland valleys where the sweet potato is the main source of protein in the diet. However, the protein content of sweet potato is low. It is likely that this low protein content, along with the high bulk of the tuber, affects the growth of young highland children. The aim of this study, therefore, was to determine the amino acid composition of different cultivars of this staple.

The fresh tubers were weighed on collection and then flown to Sydney where they were again weighed, sampled and freeze-dried. Acid hydrolysis was performed and the amino acids analysed by ion-exchange chromatographic separation and post-column ninhydrin reaction on a JEOL amino acid analyser (Pusztai and Morgan 1963). Cystine/cysteine were measured (and are expressed) as cysteic acid by treating a sample with performic acid before acid hydrolysis and analysis on the autoanalyser (Moore 1963). A method to analyse tryptophan by HPLC (DeVries et al. 1980) is being developed. The Table shows the mean content and relatively wide range of amino acids in the eight different cultivars so far tested. Protein content was 0.92 ± 0.25 g/100 g food.

Mean and range of amino acids in sweet potato from Simbu Province

	<u>Lys</u>	<u>His</u>	<u>Arg</u>	<u>Asp</u>	<u>Thr</u>	<u>Ser</u>	<u>Glu</u>	<u>Pro</u>	<u>Gly</u>
nmol/mg DM	11.2	4.5	9.9	42.1	13.4	18.3	29.6	13.2	18.2
range	7-15	3-6	7-14	30-54	8-20	12-24	19-43	8-18	12-26
g/16g N	5.9	2.5	6.2	20.2	5.7	6.9	15.7	5.5	4.9
FAO ref.pattern	4.2				2.8				
	<u>Ala</u>	<u>Cys</u>	<u>Val</u>	<u>Met</u>	<u>Ile</u>	<u>Leu</u>	<u>Tyr</u>	<u>Phe</u>	<u>Try</u>
nmol/mg DM	20.6	3.5	13.4	3.6	10.7	16.4	7.1	11.4	-
range	14-28	(a)	9-28	3-6	6-14	11-21	4-11	7-16	-
g/16g N	6.6	2.1	5.6	1.9	5.1	7.7	4.6	6.8	-
FAO ref.pattern		2.0	4.2	2.2	4.2	4.8	2.8	2.8	-

(a) One sample only

The results show that methionine is the limiting amino acid in sweet potato and that the levels of amino acids vary markedly between cultivars. This information will contribute to the selection of cultivars with the most desirable characteristics for use in nutrition and land-use programs.

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