

USE OF RAW SWEET POTATO, RAW PEANUTS AND PROTEIN CONCENTRATE IN RATIONS FOR GROWING PIGS

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ABSTRACT

Twenty-seven weaner Berkshire cross pigs were used in an experiment with three replicates to study the performance of three diets:

- (1) *A control ration based on ground sorghum and protein concentrate,*
- (2) *Raw sweet potatoes and raw whole peanuts,*
- (3) *Raw sweet potatoes and 55 per cent crude protein concentrate.*

Diets (2) and (3) were fed according to a modified Lehmann system. There were significant differences between treatment means for weight gain and food consumption for the three diets. Average daily gain (lb), average daily voluntary food consumption (lb of dry matter) and feed efficiency (dry matter basis) for the three treatments were (1) 1.246, 4.561, 3.662; (2) 0.208, 1.726, 8.533; (3) 0.7193, 3.538, 4.919. One of the pigs on the peanut/sweet potato ration died.

INTRODUCTION

INADEQUATE nutrition and low genetic potential for commercial productivity among the native pigs are the major technical problems facing the development of a pig industry in Papua New Guinea. The large population of native pigs subsists by scavenging and a little hand-feeding with sweet potatoes (Malynicz 1970). The utilization of locally grown feed-stuffs has been considered of fundamental importance in the development of commercial pig production (Iverson 1964) and the main objective of this experiment was to evaluate sweet potato and peanuts, two local foods, in pig rations.

Most of the readily available foods in Papua New Guinea such as sweet potato, cassava, taro and sago, are high in water and carbohydrate but low in protein. Lehmann of Gottingen in Germany devised a feeding system for growing pigs based on the use of a similar starchy staple, the potato. The system consists in feeding a fixed amount of protein supplement from weaning to slaughter, in addition to which a

starchy staple is fed to appetite. The system, with modifications, has been examined by Anon. (1930), Braude and Foot (1941), Butterworth and Houghton (1963) and Devendra (1963). The following paper describes an experiment based on the Lehmann method but utilizing sweet potato as the starchy staple with whole raw peanuts or a protein concentrate as the fixed protein supplement.

MATERIALS AND METHODS

A total of 27 male and female grade Berkshire cross Tamworth weaner pigs was used in the experiment. These were taken from three replicates of nine, allocated at random on the basis of litter origin to plots of three pigs per treatment. There were thus nine groups of three pigs in the experiment. The treatment rations compared are shown in Table 1.

All pigs were housed in open-fronted concrete-floored pens during the experiment which lasted for 12 weeks. Water was available *ad libitum*. Food was given once daily with uneaten residues weighed to allow estimates of food consumption for each treatment group to be obtained. Pigs were weighed at weekly intervals.

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Table 1.—Characteristics of diets based on sweet potato, peanuts, protein concentrate and ground sorghum

Ingredient	Ration		
	1	2	3
Ground sorghum	80 per cent		
Protein concentrate*	20 per cent		to 1 lb daily
Raw peanut kernels		to 1½ lb daily	
Raw sweet potato		<i>ad libitum</i>	<i>ad libitum</i>

*Hutmills, Melbourne, composition—minimum crude protein 55 per cent, salt 2 per cent, per lb Vit A 34,000 I.U., Vit D3 5,800 I.U., Vit E 28 I.U., Vit B2 12 mg.

Table 2.—Treatment effects of diets based on sweet potatoes, peanuts, protein concentrate and ground sorghum ration

	1 Control	2 Peanut	3 Concentrate	Standard Error	Significance
Initial weight (lb)	33	26	31	3.3	Not significant
Average daily gain (lb)	1.246	0.2018	0.7193	0.1201	1-3 $P < 0.01$ 1-2 and 2-3 $P < 0.05$
Daily dry matter consumption (lb)	4.561	1.726	3.538	0.1432	All differences $P < 0.01$
Feed efficiency	3.662	8.533	4.919		

RESULTS

Table 2 shows treatment effects for average daily gain, daily voluntary food consumption and feed efficiency. Analysis of variance and Duncan's test were used to assess significance between treatment means (Steel and Torrie 1960). One of the pigs on the peanut/sweet potato ration died during the experiment and others after its completion.

DISCUSSION

The pigs on the ground sorghum/protein concentrate diet gained weight at the rate of 1.246 lb per day. The concentrate/sweet potato group showed significantly lower ($P < 0.05$) weight gains, as did the peanut/sweet potato pigs ($P < 0.01$). There were corresponding significant differences in voluntary food consumption. Feed efficiency was greatest on the control ration and least on the peanut/sweet potato ration. At Goroka prices the costs per lb of liveweight gains for the sorghum concentrate and the sweet potato concentrate rations were

22.0 and 25.6 cents respectively, which considering the present ruling price of 50 cents per lb liveweight should allow a reasonable return on either ration.

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REFERENCES

- ANON. (1930). *Scot. J. Agric.*, 13 : 30.
 BRAUDE, R. AND FOOT, A. S. (1941). *J. Agric. Sci.*, 32 : 70.
 BUTTERWORTH, M. H. AND HOUGHTON, T. R. (1963). *Emp. J. Exper. Agric.*, 31 : 14.
 DEVENDRA, C. (1963). *Malayan Agric. J.*, 44 : 26.
 IVERSON, K. R. (1964). *The Economic Development of the Territory of Papua and New Guinea* (International Bank for Reconstruction and Development: Washington).
 MALYNICZ, G. L. (1970). Pig keeping by the subsistence agriculturalists of the New Guinea Highlands. *Proc. ANZAAS Conf. Port Moresby*.
 STEEL, R. G. D. AND TORRIE, J. H. (1960). *Principles and procedures of Statistics* (McGraw Hill: New York).

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