CASSAVA AS A LIVESTOCK FEED?

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INTRODUCTION

In 1981, about 34 000 tonnes of compounded stockfeed (that is, feed made up of various ingredients to give a balanced diet), were used in Papua New Guinea. Since the poultry and pig industries are expanding rapidly, this figure could reach 47 000 tonnes by 1985. Of these amounts, over half is made up of imported grains, mainly sorghum.

Some sorghum is grown in the Markham Valley. However, the supply is small and irregular. Unsuitable weather conditions result in crop failure, mould and insect infestations and poor production.

With the price of sorghum now at about K130 per tonne, the cost of importing grain is over 2 million kina. This will rise to over 3 million kina by 1985, unless a suitable locally produced alternative is found.

Cassava is one of the traditional garden crops of Papua New Guinea. It can be grown in most parts of the country. In some experiments, yields of up to 60 tonnes per hectare have been reported, though commercial production would be around 25-40 tonnes per hectare. Fresh tubers contain about 30% dry matter. Thus production of dried cassava root meal is 7.5 to 12 tonnes per hectare.

In comparison, in the Markham Valley, sorghum yields are about 2 tonnes/ha. From these figures it looks as if cassava may be a suitable alternative to sorghum grain as a stockfeed base. One disadvantage of cassava however, is its low protein content compared with sorghum.

Research has been carried out at the Poultry Research Centre, Labu on cassava growing and costs. Feeding trials using broiler chickens were also conducted.

THE RESEARCH

Growing cassava

An area of about 0.1 ha was cleared for planting cassava. Planting material of an unknown variety was collected locally. During the first two months, the area was weeded occasionally. After nine months the tubers were harvested, and the yield per hectare worked out.

All land preparation, planting, weeding and harvesting were done by hand, and the cost of labour was recorded.

Production of cassava chips

Fresh tubers were washed free of soil and cut into chips using a foot-operated machine imported from mainland China

(through the South Pacific Appropriate Technology Foundation, P.N.G.). The chips were then spread thinly on trays and dried in a solar drier for 24 hours. Over the next 48 hours, the drying continued, but the chips were turned from time to time until they were brittle. The dried chips were then weighed.

Labour costs for chipping and drying were worked out. The cost of machinery is not included in the estimates, but chipping machines can be bought from S.P.A.T.F. for around K70 to K100.

For information about the chipping machine and the solar drier, contact the Poultry Research Centre, P.O. Box 73, Lae (Telephone 42 1022).

Broiler feeding trial

Two diets were made up to contain the same energy : protein ratio. One diet was based on sorghum, while the other diet had almost all the sorghum replaced by cassava. Table 1 shows the ingredients of each diet. Since cassava has a lower protein content than sorghum, extra soya bean meal had to be added to that diet to make up enough protein.

As well as these two diets, commercial broiler starter and finisher feed (from the Lae Feed Mill) was used in the trial. No list of ingredients was available for this feed, but it also was sorghum-based. All the feeds were in pellet or crumble form.

Each of the first two diets was tested on four groups of day-old broiler chicks (15 chicks per group). The commercial feed was given to two groups only.

Measurements of feed intake, body weight gain, and feed conversion (grams of feed eaten per gram of body weight gain) were made when the chickens were 32 and 56 days old.

The machine used for chipping cassava

Cassava chips

TABLE 1. COMPOSITION OF THE DIETS (PARTS PER 100.36)

Ingredients	Cassava-based	Sorghum-based
Cassava root meal	50	-
Soya bean meal	30	19
Meat and bone meal	10	10
Sorghum	4	44
Mill run (roughage)	-	21
Tallow	5	5
Vitamin mix	1	1
Mineral mix	0.3	0.3
Choline chloride	0.06	0.06
(Total parts:	100.36	100.36

TABLE 2. FEEDING TRIALS

Diet	Body weight (kg)		Feed conversion	
	32 days	56 days	32 days	56 days
Cassava-based	0.863	2.233	2.00	2.29
Sorghum-based	0.906	2.163	2.01	2.33
Commercial	0.904	2.197	2.11	2.35

TABLE 3. COST OF FEED PRODUCTION

Ingredients	Price per tonne (kina)	Cassava-based (kina)	Sorghum-based (kina)
Cassava root meal	(75.80)	(37.90)	-
Soya bean meal	300	90.0	57.0
Meat and bone meal	320	32.0	32.0
Sorghum	130	5.20	57.20
Mill run	90	-	18.90
Tallow	350	17.50	17.50
Vitamin mix	1000	10.0	10.0
Mineral mix	1000	3.0	3.0
Choline chloride	5000	3.0	3.0
Total cost per tonne		198.60	198.60

RESULTS

Production costs

The yield of cassava from the 0.1 ha plot was 18.4 tonnes/ fresh cassava per hectare. This was converted to 7 tonnes dried cassava per hectare. The cost of producing dried cassava chips was as follows. The figures are all labour costs per hectare.

Land clearing and preparation	K100
Planting and weed control	K 60
Harvesting	K150
Total cost fresh/ha	K310
Chipping	K 60
Drying	K 50
Total cost dry/ha	K420

At a yield of 7 tonnes/ha, the price of dried chips is K60 per tonne. The cost of growing sorghum in the Markham Valley is not known. However, the price of sorghum to growers is K120 - K135 per tonne.

Feeding trials

Results of the feeding trials are shown in Table 2. They show that body weights and feed conversions for the sorghum-based, the cassava-based and the commercial diets are similar.

Costs of feeds

Table 3 gives a breakdown of the cost of the different components of the two made-up diets, using the market values of the raw materials. The ingredients of the commercial feed were not known, but the cost was K255 per tonne.

The sorghum-based diet cost K198.60 per tonne. The cassava-based diet cost K160.70 per tonne, not including the cost of cassava. As both these diets gave similar growth rates, it is reasonable to assume that the feeds should cost the same.

Hence the cassava component would cost K37.90 (that is, K198.60 minus K160.70). As cassava meal made up half the diet, the price of cassava per tonne would be K75.80.

With a production cost of K60 per tonne, growers could expect a profit of K15.80 per tonne of dried cassava, or K110.60 per ha planted.

CONCLUSION

Cassava is known to have lower protein content than sorghum, at the same time, a higher fibre (roughage) content. If these differences are taken into account when making up stock feed, then cassava root meal would make a good alternative to sorghum as a diet base.

The trials at Labu showed that farmers could get a good return from growing and drying cassava for sale as a stock feed.