

## Rubber Seed Meal as a Protein Supplement in Growing Swine Rations

A. S. B. RAJAGURU AND V. RAVINDRAN

*Department of Animal Husbandry, University of Peradeniya, Peradeniya, Sri Lanka.*

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**Abstract :** A study was conducted to investigate the effects of different levels of rubber seed meal on the performance of growing swine. The results indicate that rubber seed meal could be included in swine rations only upto 10% level. Poor performance of swine fed on rations containing 20% and 30% rubber seed meal was attributed to deficiencies of lysine and sulphur amino acids, rather than to the presence of cyanogenic glucoside.

### 1. Introduction

The usefulness of rubber seed meal as a protein supplement in poultry rations is well documented.<sup>2,3,6,7</sup> However there is no record of the use of rubber seed meal in swine rations. Hence it was intended in this study to investigate the possibility of utilizing rubber seed meal as a replacement for coconut poonac which is the traditional protein supplement in rations for growing swine. This trial was conducted at the Swine Production Unit of the Department of Animal Husbandry of the University of Peradeniya, Sri Lanka.

TABLE 1. Chemical composition of rubber seed meal (%)

Dry matter	—	91.14
Crude protein	—	24.70
Ether extract	—	7.18
Crude fibre	—	10.16
Ash	—	5.59
Nitrogen free extract	—	37.61
Hydrocyanic acid	—	0.0019

### 2. Experimental

The rubber seed meal used was supplied by Lever Brothers (Ceylon) Ltd., and the proximate analysis of this material is shown in Table 1.

TABLE 2. Percentage composition of rations used in the trial.

	Control	10% Rubber seed meal	20% Rubber seed meal	30% Rubber seed meal
Coconut poonac	30	20	10	—
Rubber seed meal	—	10	20	30
Wheat flour	40	40	40	40
Rice polish	23	23	23	23
Meat meal	5	5	5	5
Bone meal	2	2	2	2
Zoodry*	0.25	0.25	0.25	0.25
Proximate composition**				
Crude protein %	15.90	16.24	16.58	16.92
Crude fibre %	4.84	4.69	4.54	4.39
Ether extract %	5.31	5.81	6.31	6.81
Ash %	7.20	7.14	7.08	7.02

\*Vitamin and mineral supplement      \*\*Calculated values.

Thirty two crossbred swine, of approximately three months of age and weighing an average of 18.12 kg, were allocated at random to four treatments. A coconut poonac based ration, which was balanced to carry the nutrient requirements of growing swine as recommended by the National Research Council<sup>5</sup>, served as the control. The coconut poonac was replaced by 10, 20 and 30 % levels of rubber seed meal in the experimental rations. Composition of ration is presented in Table 2.

The housing and feeding procedures used in this trial were identical to those described by Rajaguru *et al.*<sup>8</sup> Intake capacity of feed in each group was estimated at the beginning of each week, on the basis of feed consumption per half an hour. The feed provided per meal, in all groups, was then restricted to the lowest estimate recorded per group, so that the feed intake between groups was maintained at the same level. The feed intake determined this way was used as the basis of feeding during the week. Weekly weight gains were recorded throughout the trial period, which lasted eight weeks.

### 3. Results

The effect of different levels of rubber seed meal on the performance of growing swine is shown in Table 3.

TABLE 3. Mean effects of different levels of rubber seed meal on rate and efficiency of gain of growing swine.

	Initial weight (kg)	Final weight (kg)	Weight gain (kg)	Feed consumption (kg)	Feed Conversion efficiency
Control	17.50	35.64	18.14 <sup>a</sup>	70.0	3.85 <sup>a</sup>
10% Rubber seed meal	17.67	34.12	16.45 <sup>a</sup>	70.0	4.25 <sup>a</sup>
20% Rubber seed meal	19.09	33.57	14.48 <sup>b</sup>	70.0	4.80 <sup>a</sup>
30% Rubber seed meal	17.61	25.97	8.36 <sup>c</sup>	70.0	8.37 <sup>c</sup>

Statistical significance at 5% level is denoted by different letters.

There is no significant differences in the weight gains or feed conversion efficiency of growing swine fed on control ration and those fed on rations containing 10% rubber seed meal. However, the growth response and feed conversion efficiency were depressed progressively and significantly as the levels of rubber seed meal in the rations were increased.

#### 4. Discussion

The results indicate that the rubber seed meal could be used only upto 10% level in growing swine rations. Increasing the levels of rubber seed meal over 10% depressed performance of growing swine. This effect may be attributed to amino acid imbalance rather than any other nutrient deficiency, since the composition (Table 1) and metabolizable energy values<sup>9</sup> of rubber seed meal are somewhat similar to those of coconut poonac. When the essential amino acid requirements of growing swine<sup>5</sup> was compared with the amino acid profile of rubber seed meal,<sup>4</sup> it was revealed that rubber seed meal is deficient in lysine and sulphur amino acids for growing swine. Various workers have suggested similar amino acid imbalances in rubber seed meal based poultry rations.<sup>3,7</sup> Thus by supplementing these essential amino acids, it may be possible to improve the nutritive value of rubber seed meal for growing swine. Further research in these lines is suggested.

The presence of cyanogenic glucoside in rubber seed meal was reported first by Bredemenn.<sup>1</sup> This deleterious factor is mainly found in the kernel of the seed and would be destroyed at temperatures above 25°C.<sup>9</sup> The decorticated rubber seed meal used in this trial contained less than 0.002% (20 PPM) HCN hence, this could not have been the reason for the poor performance of swine fed 20% and 30% rubber seed meal. Rajaguru *et al*<sup>8</sup> reported that growing swine could tolerate cyanide levels higher than this.

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