

THE USE OF PEANUT PLANT MEAL ("ARACHIS HYPOGAEA") AND BEAN SEED MEAL ("PHASEOLUS VULGARIS") IN CHICKEN STARTER RATIONS

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ABSTRACT

Various levels of peanut plant meal were substituted in a maize/soybean ration and fed to chickens from hatch to 19 days of age. When compared with a maize/soybean ration containing a similar crude protein level of 21 per cent., it was found that peanut plant meal included in the ration in concentrations of 10 and 20 per cent. did not alter the growth rate of the birds significantly, and that concentrations of 30, 40 and 50 per cent. depressed growth.

Chickens fed 5, 10 and 15 per cent. of bean seed meal either raw or cooked, when compared with chickens fed a maize/soybean meal ration, were not significantly different in weight. At a concentration of 20 per cent. a growth depression occurred.

INTRODUCTION

THE use of peanut plant meal in poultry growing and laying rations has previously been reported by Springhall (1967). Since that report, further trials have been undertaken to determine the use of this material in chicken starter rations.

Bean meal has been included in poultry rations previously (Heuser, 1955). It has been suggested that it is better to cook beans before feeding them to poultry. As beans are available in the Territory of Papua and New Guinea, their ability to support growth of poultry at various levels was investigated.

MATERIAL AND METHODS

Peanut plant meal was prepared similarly to that already described by Springhall (1967).

A quantity of bean seeds, *Phaseolus vulgaris*, was obtained. Half the material was fed raw and the remainder was boiled then dried. The analysis of the test ingredients is shown in Table 1.

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Table 1.—Analysis of ingredients.
(Expressed as grams per 100 grams, on an air dry basis).

Material.	Crude Protein.	Ash.	Fat.
Peanut Plant Meal	16.6	8.2	20.5
Bean Seed Meal	20.6	2.7	3.5

The composition of the rations is shown in Table 2. The vitamin and mineral pre-mixes were composed similarly to those previously described by Springhall (1967).

Meat strain chickens were obtained from a commercial hatchery. The birds were then selected at random, weighed, wing banded, and placed in groups of 10, into pens in an electric brooder unit which had wire floors. Two groups were allotted to each treatment.

The experiment was conducted from hatching to 19 days of age. Body weights were recorded on the 12th and 19th days. Feed and water were provided *ad libitum* and continuous lighting was supplied.

The composition of the control and experimental rations is shown in Table 2. All the experimental rations were compounded by substituting the test material for a portion of maize and soybean meal at the levels indicated. All test rations were calculated to contain 21 per cent. crude protein by adjusting the quantities of maize and soybean meal in the control ration to compensate for the added ingredient. No attempt was made to balance the energy content of the rations. The materials were hammermilled before using.

Statistical treatment of the data consisted of the analysis of variance (Snedecor, 1964) and the multiple range test (Duncan 1955, Kramer 1956).

RESULTS AND DISCUSSION

The results of the feeding trial using peanut plant meal are shown in Table 3.

At 19 days the birds receiving the rations containing 10 and 20 per cent. peanut plant meal were not significantly different in weight from those on the control ration. However, at higher concentrations, (30, 40 and 50 per cent.), the body weights were not as great as those of the birds receiving the 10 and 20 per cent. rations.

The feed conversion followed a similar pattern, namely that 10, 20 per cent. and control rations were slightly better than the 30, 40 and 50 per cent. group.

Table 2.—Composition of Peanut Plant and Bean Seed Meal Starter Rations (%).

Ingredient.	Control.	Experimental Rations.								
Maize	64.3	56.1	48.0	39.8	31.7	23.5	60.7	57.1	53.5	49.9
Soybean Meal (50%)	30.4	28.6	26.7	24.9	23.0	21.2	29.0	27.6	26.2	24.8
Peanut Plant Meal	—	10	20	30	40	50	—	—	—	—
Bean Seed Meal	—	—	—	—	—	—	5	10	15	20
Dicalcium Phosphate	4	4	4	4	4	4	4	4	4	4
Salt	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Vitamin and Mineral Premix	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total	100	100	100	100	100	100	100	100	100	100

Table 3.—Mean body weights of birds fed rations containing graded levels of peanut plant meal.

Group.	Per cent. Peanut Plant Meal.	19 day weight (g) Mean of 2 replicates.	Feed Conversion.	Mortality per 20 birds
1	0	211	1.9	0
2	10	200	1.8	1
3	20	196	1.7	0
4	30	166	2.0	0
5	40	141	2.2	1
6	50	123	2.3	0

Table 4.—Mean body weights of birds fed graded levels of raw and cooked bean seed meal.

Group.	Per cent. Raw Bean Meal.	19 day weight (g) mean of 2 replicates.	Feed Conversion.	Mortality.	Per cent. cooked Bean Meal.	19 day weight (g) mean of 2 replicates.	Feed Conversion.	Mortality per 20 birds
1	0	211	1.9	0	0	211	1.9	0
2	5	203	1.7	0	5	186	1.9	0
3	10	194	1.9	1	10	195	1.9	1
4	15	183	2.0	0	15	179	1.9	0
5	20	163	2.2	0	20	160	2.2	0

From the results of this trial in which peanut plant meal was compared with a maize/soybean ration it is suggested that peanut plant meal should not be included in poultry starter rations in concentrations greater than 20 per cent. of the ration.

The cooking of the bean meal did not significantly improve the growth rates at any level fed (PK.01). From the results obtained it is suggested that the optimum levels of bean meal should not exceed 15 per cent. in starter rations, when compared with a maize/soybean meal ration.

SUMMARY

1. Chickens fed 10 and 20 per cent. peanut plant meal for 19 days did not have significantly different growth rates from those fed a maize/soybean ration. It is suggested that concentrations greater than 20 per cent. be not used in chicken starter rations.
2. Chickens fed 5, 10 and 15 per cent. bean seed meal for 19 days did not show significantly different growth rates. Similar levels of cooked bean seed meal produced

similar results. If this material is used for young chicks, it is recommended that the amount included in the ration be not greater than 15 per cent., when compared with a maize/soybean meal ration.

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