

## Effect of Replacing Groundnut cake by soybean meal on Performance of Broilers

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### Abstract

Two hundred day old broiler chicks were randomly distributed in five groups with two replicates. Groundnut cake of control diet was replaced by soybean meal at 25, 50, 75 and 100 percent levels. The overall data indicated that the weight gain of birds fed with 75 percent Soybean meal was significantly ( $p < 0.01$ ) higher than other treatments. Feed consumption was significantly ( $P < 0.01$ ) more at 75 percent Soybean meal replacement than other treatment diets. Feed efficiency was best at 100 percent replacement as compared to other treatment. The proximate composition revealed that CP, EE, and total ash of Soybean meal were higher and CF, ME were lower than groundnut cake. It may be inferred that Soybean may be economical at 75 percent and 100 percent replacement.

**Keywords:** Groundnut cake, Soybean meal, Broilers, Performance.

### Introduction

The major object of poultry production is to produce meat and eggs efficiently, at economical rate, which is only possible by using cheaper locally available feed ingredients because the feed alone contribute to 70 to 75 percent of the total cost of poultry production (Panda and Mahapatra, 1989). In India, the cheaper protein source like groundnut cake and fish meal are used as major protein sources in poultry feed formulation, but failure of groundnut crop and susceptibility of groundnut cake to aflatoxin are the limiting factors whereas wide variation in quality due to adulteration in fish meal has initiated search for other potential protein sources. Amongst the other protein sources Soybean meal has emerged as the most promising one because of its better protein quality and fairly consistent nutrient content.

### Materials and Methods

Two hundred day old straight run broiler chicks of vencob strain were divided into five groups with two replicates. Each replicate had 20 chicks. The chicks were reared in deep litter pens for 6 weeks by providing ad lib fresh and clean water and weighed quantity of feed. The control diet (To) was formulated using groundnut cake as major protein source and the experimental diets T1, T2, T3 and T4 were formulated by replacing groundnut cake by soybean meal at 25, 50, 75 and 100 percent levels respectively (Table 1). The diets were made isocaloric and isonitrogenous by adjusting the other ingredients. The proximate

composition of the feed ingredients were analyzed as per A.O.A.C. (1985) and the same is furnished in Table 2, weekly body weights and feed consumption were recorded. The data on body weight gain, feed consumption and feed conversion ratio were statistically analyzed as per her methods of factorial one way analysis of variance. The twenty birds were divided into two homogenous groups and the treatments were repeated twice as replication for 20 birds each and the data were analyzed (Snedecor and Cochran, 1967). Experimental feed was formulated as per recommendation of BIS 1992.

### Results and Discussion

The proximate composition revealed that CP, EE and total ash of Soybean Meal were higher and crude fiber; Nitrogen free extract and metabolizable energy were lower in comparison with groundnut cake.

The final weight gain of birds fed with 100 % and 75% had significantly ( $p < 0.01$ ) superior performance than of To (244.22g) T1 (239.60g) and T2 (247.11g).

Superior performance of birds in T3 and T4 groups was due to high content of lysine and methionine in soybean meal which is in close agreement with the findings of Subbaiah and Rao (1984), Dogan and Aghaz (1989), Aziz et al. (2001). Treatments To, T1 and T2 differ significantly from each other ( $P < 0.01$ ) and recorded lowest body weight gain. It may be due to presence of high crude fiber content and groundnut cake as sole protein source was not efficient for good body weight gain. These findings are in close agreement with Singh and Prasad (1979).

Table – 1 Percent Composition of experimental diets.

Ingredients	Control(To)	T1	T2	T3	T4
Maize	60.00	60.00	60.00	60.00	61.00
Groundnut Cake	33.00	24.75	16.50	8.25	0.00
Soybean Meal	0.00	7.87	15.75	23.62	31.52
Fish Meal	5.00	5.00	5.00	5.00	5.00
DORB	0.00	0.38	0.75	1.13	0.50
Min Mixture	1.50	1.50	1.50	1.50	1.50
Vitamins	0.30	0.30	0.30	0.30	0.30
Coccidiostat	0.20	0.20	0.20	0.20	0.20
Total	100	100	100	100	100
C.P.	21.80	22.00	22.22	22.44	22.62
ME K Cal/Kg (Calculated)	2978.00	2960.87	2943.76	2926.55	2920.67
C/P Ratio	136.60:1	134.58:1	132.48:1	130.42:1	129.12:1

Table – 2 Proximate Composition of different feed ingredients.

Nutrients	Maize	Groundnut Cake	Soybean Meal	Fish Meal	DORB
Crude Protein	9.10	42.10	46.22	49.15	14.10
Ether Extract	4.10	5.03	19.91	5.16	1.08
Crude fiber	2.5	6.96	5.89	3.46	12.42
Nitrogen free extract	81.29	41.00	21.09	23.58	59.13
Total Ash	3.01	4.91	6.89	18.65	13.27
Acid insoluble Ash	1.41	2.61	3.01	9.13	6.21
ME/ Kcal/ Kg	3350	2600	2400	2200	2235

From the table-3, it is observed that all the chicks receiving Soybean meal incorporated feed at 100% level consumed significantly ( $P < 0.01$ ) more feed than the control (groundnut) diet. The energy content of all the diets are similar but the higher fiber content might had induced low feed intake in treatment (To control) Group. The feed intake of T3, T4, T2 and T1 was comparable which was in partial agreement with singh and Prasad (1979). Mohan et al. (1984).

Soybean meal as a sole protein source was superior ( $P < 0.01$ ) in converting the feed than other groups i.e. T1 and To control.

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Table-3. Results of the feed trial

Criteria	Control(To)	T1 (25%)	T2 (50%)	T3 (75%)	T4 (100%)
Body weight gain (gm)	224.22 <sup>c</sup>	239.60 <sup>b</sup>	247.11 <sup>b</sup>	269.60 <sup>a</sup>	267.35 <sup>a</sup>
Feed Consumption (gm)	438.61 <sup>b</sup>	454.72 <sup>ab</sup>	461.54 <sup>ab</sup>	477.15 <sup>a</sup>	462.68 <sup>ab</sup>
F.C.R.	2.00 <sup>c</sup>	1.93 <sup>cb</sup>	1.86 <sup>ba</sup>	1.81 <sup>a</sup>	1.77 <sup>a</sup>

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