

# IMPACT OF FEED ON GROWTH AND DEVELOPMENT OF DIFFERENT BROILER-STRAINS

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## ABSTRACT

An experiment was carried out on three broiler-strains viz- Vencove ( $B_1$ ), Hubbard ( $B_2$ ) and Croiler ( $B_3$ ) at the selected poultry farms in Gorakhpur region with the objective to investigate a suitable feed/ration for local poultry raisers. For this purpose three type of feeds were taken as broiler mash 100 percent ( $F_1$ ) considered as a control group, soybean 30 percent + maize 70 percent ( $F_2$ ) and broiler mash 30 percent + maize 70 percent ( $F_3$ ) supplied to 28000, 35150 and 27250 number of birds in each experimental group, respectively with three replications. Initial average body weight of day old, average feed intake, feed conversion efficiency, body weight gain and mortality of Table birds, was recorded and analyzed. The average feed intake in treatment groups  $F_1$ ,  $F_2$  and  $F_3$  was estimated 2.26kg, 2.16kg and 2.23kg, respectively, body weight gain in these groups were calculated as 1.07kg, 1.15kg and 1.08kg per bird and the corresponding value for feed conversion efficiency was 1.94kg, 1.76kg and 1.89kg per bird in all the groups, respectively. Results of experiment show  $F_2$  feed was the best feed in overall experiment. Feed intake, body weight gain and feed conversion efficiency for all the three treatment groups were found to be highly significant ( $P < 0.01$ ).

## INTRODUCTION

Broiler production grew rapidly for many years, fuelled by powerful shifts in consumption patterns and therefore, Broiler production is organized in a distinctive manner. As advances in feeding and formulation technique have been made, it has become a relatively easy task in areas such as Gorakhpur region that have access to a variety of quality feed ingredients to meet the nutritional requirement of poultry. Compared to many other industries, the poultry industry is considerably advanced in terms of understanding how to feed birds to meet maximum growth. Indeed, one needs only to feed all nutrients in excess to meet such growth, although this is a far from ideal method for a variety of reasons, including efficiency and expenses. As a result, the current goal has shifted away from just feeding to reach certain growth standards to meeting maximum growth in the most cost efficient manner, or finding least cost per unit gain. Developing feeding programs that utilize concept such as ideal protein, formulation programs that calculate the ingredient combinations that will closely meets the birds' nutritional requirements at the least possible cost (Pesti and Miller, 1992). Poultry owner of different areas of Gorakhpur region are maintaining chicken strain of their own choice. Some of them are having layer but majority of the person are engaged in broiler production for higher economical return. Most of the poultry owners are preparing their own ration, on the basis of feed ingredients as soybean and maize available at cheaper rate in the local market. Keeping in view the above facts, the present study was planned with the objective to know the current association between effect of different feed ingredients in relation to feed intake,

body weight gain and meat production in broiler-strains. In view of the aforesaid; our study was carried out to study previous factors in our field condition up to 4weeks of age.

## MATERIALS AND METHODS

An experimental trial was carried out on three breeds of fowl viz- Vencove ( $B_1$ ), Hubbard ( $B_2$ ) and Croiler ( $B_3$ ) i.e. three broiler- strain, production at the selected poultry farms in Gorakhpur with the objective to investigate a suitable feed/ration. For this study three treatment groups of feed were taken. These groups of treatments were broiler mash 100 percent ( $F_1$ ) considered as a control group, soybean 30 percent + maize 70 percent ( $F_2$ ) and broiler mash 30 percent + maize 70 percent ( $F_3$ ). The number of birds in each experimental group were 28000, 35150 and 27250 in  $F_1$ ,  $F_2$  and  $F_3$ , including the three replications. Initial average body weight of day old chicks was 41.07gm, 40.63gm and 40.73gm in three treatment groups, respectively. Average feed intake, feed conversion efficiency (FCE), body weight gain and mortality of table birds, was recorded. Above parameters was measured weekly using the following Formula: Feed intake kg/bird = Feed consumption in a replication / No. of live birds in a replication (Ghazi *et al.*, 2012).  $FCE = \text{Feed intake (kg)/weight gain(kg)}$  (Dr. Frank O'Mara). The mortality rate was recorded from 0 weeks until the 4 weeks using the following formula. Mortality % = No. of death birds in a replication / No. of initial birds in a replication X 100. Factorial randomized block design was used for conducting experiment and statistical analysis for test of significant (Ghazi *et al.*, 2012).

**Table 1: Average feed intake, Body weight gain and Feed Conversion Efficiency of different strains of Fowl**

Breed	Average feed intake (kg/bird)			Average body gain weight (kg/bird)			Average feed conversion efficiency (kg/kg bird)		
	F1	F2	F3	F1	F2	F3	F1	F2	F3
B1	2.01 ± 0.02	1.94 ± 0.02	1.98 ± 0.07	1.02 ± 0.02	1.13 ± 0.02	1.05 ± 0.07	1.73 ± 0.03	1.58 ± 0.04	1.63 ± 0.03
B2	1.97 ± 0.02	1.86 ± 0.05	1.87 ± 0.04	1.03 ± 0.02	1.09 ± 0.05	1.04 ± 0.04	1.67 ± 0.03	1.52 ± 0.07	1.60 ± 0.03
B3	2.80 ± 0.04	2.68 ± 0.05	2.85 ± 0.06	1.03 ± 0.03	1.06 ± 0.05	1.05 ± 0.02	2.43 ± 0.05	2.20 ± 0.07	2.38 ± 0.05
Mean	2.26	2.16	2.23	1.02	1.09	1.04	1.94	1.76	1.89

**Table 2: Analysis of variance for different breeds and feeds:**

Sources of Variance	F Calculated Value		Body weight gain		FCE		F Table Value				
	Feed Intake	CD	CD	CD	CD	CD	CD	CD			
	F <sub>Cal</sub>	5%	1%	F <sub>Cal</sub>	5%	1%	F <sub>Cal</sub>	5%	1%	5%	1%
Feed	154.25**	-	-	0.71	-	-	496.04**	0.05	0.07	3.63	6.23
Breed	3.88*	0.05	0.07	15.50**	-	-	24.29**	0.05	0.07	3.63	6.23
Interaction	1.42	-	-	-	-	-	0.88	-	-	3.01	4.77

\*\* Significant at 1% level of significance ( $P < 0.01$ ); Significant at 5% level of significance ( $P < 0.05$ )

## RESULTS AND DISCUSSION

### Feed Intake

Average feed intake of birds in B<sub>1</sub>, B<sub>2</sub> and B<sub>3</sub> groups were estimated as 2.01 ± 0.02Kg, 1.97 ± 0.20Kg, and 2.80 ± 0.04Kg per birds, respectively. minimum feed intake was in B<sub>2</sub> group (1.97 ± 0.02kg/ bird) followed by B<sub>1</sub> group (2.01 ± 0.02kg/ bird) and the maximum in B<sub>3</sub> group (2.80 ± 0.04kg/bird) with an overall average of 2.26kg/bird in F<sub>1</sub>, control group of treatment (broiler mash). In F<sub>2</sub> treatment (30 per cent soybean + 70 percent maize) the average feed intake in B<sub>1</sub>, B<sub>2</sub> and B<sub>3</sub> groups were 1.94 ± 0.20, 1.86 ± 0.05 and 2.68 ± 0.05kg/bird, respectively, with the maximum feed intake in B3 group (2.68 ± 0.05kg/bird), followed by groups B<sub>1</sub> and B<sub>2</sub>. Overall average value of F<sub>2</sub> treatment was 2.16kg/bird. Similarly in F<sub>3</sub> treatment the average feed intake was recorded to be 1.98 ± 0.07, 1.87 ± 0.04 and 2.85 ± 0.06 kg/bird with an overall average of 2.23kg/bird in B<sub>1</sub>, B<sub>2</sub> and B<sub>3</sub> groups, respectively (Table 1). The findings of our research were similar to the observations reported by Rajendran *et al.* (1990) according to him, for the groups 1 and 2 average feed intake per broiler was 1.196 and 1.127 in the starter phase and 2.259 and 2.777kg in the finisher phase. Torres *et al.* (2003) also conducted an experiment on Hubbard broilers and evaluated that corn and soybean meal based diet reduced feed intake and improved feed conversion in birds. Maximum feed intake was found in B3 groups followed by B<sub>1</sub> and B<sub>2</sub>. A highly significant difference was estimated between the three treatment groups of feed as well as three broilers – strains ( $P < 0.01$ ), (Table 2). Kumar *et al.* (1995) reported that 2.25 kg feed intake per kg broiler production.

### Body weight gain

Average body weight gain in B<sub>1</sub>, B<sub>2</sub> and B<sub>3</sub> groups of broiler-strain were 1.02 ± 0.02, 1.03 ± 0.02 and 1.03 ± 0.03 kg/bird, respectively for treatment group F<sub>1</sub>. Maximum Body weight gain was observed in B<sub>2</sub> group followed by B<sub>1</sub> with an overall average of 1.02 kg/birds in control group of F<sub>1</sub> treatment. In F<sub>2</sub> treatment average body weight gain was estimated as 1.13 ± 0.02, 1.09 ± 0.05 and 1.06 ± 0.05 kg/bird in B<sub>1</sub>, B<sub>2</sub> and B3 groups, respectively, with an overall average of 1.09 kg/bird. Similarly, in F3 treatment of feed, the maximum body weight

gain was estimated in B<sub>3</sub> groups (1.05 ± 0.02 kg/bird) followed by B<sub>1</sub> group (1.05 ± 0.07 kg/bird) and the minimum in B<sub>2</sub> group (1.04 ± 0.03 kg/bird) with an overall average of body weight of 1.04 kg/bird, respectively (Table 1). This result might be supported by Preston *et al.* (2000) and Jahan *et al.* (2006) who showed significantly poorer performance of mash-fed birds in terms of body weight gain. The statistical differences in body weight gain due to different feed was observed highly significant in the three broiler-strains ( $P > 0.01$ ) (Table 2). But amongst the three treatment groups of feed *i.e.* F<sub>1</sub>, F<sub>2</sub> and F<sub>3</sub> the difference was non-significant; this might be due to inclusion of soybean with maize. Zanella *et al.* (1999) found in their study that supplementation of Avizyme (0.1%) to corn-soybean based diet had improved the body weight gain by 1.9% over that of control. Yu *et al.* (2007) explained that the broilers chickens in the enzyme supplemented groups had better body weight gain as compared to those without supplementation in maize-soybean diet.

### Feed conversion efficiency (FCE)

The highest FCE was recorded in B<sub>3</sub> group (2.43 ± 0.05kg/kg bird), followed by B<sub>1</sub> (1.73 ± 0.03) and the lowest in B<sub>2</sub> group (1.67 ± 0.03 kg/kg bird) with an overall average of 1.94kg/bird in F<sub>1</sub> treatment, where as in F<sub>2</sub> treatment, the FCE was 1.58 ± 0.04, 1.52 ± 0.07 and 2.20 ± 0.07 kg/kg bird in B<sub>1</sub>, B<sub>2</sub> and B<sub>3</sub> groups, respectively. Maximum FCE was in B<sub>3</sub> group followed by B<sub>1</sub> group and the minimum in B<sub>2</sub> group. Overall average was 1.76kg/kg bird. In case of F<sub>3</sub> treatment, the FCE in B<sub>3</sub> group (2.38 ± 0.05 kg/kg bird) followed by B<sub>1</sub> group (1.63 ± 0.03kg/ bird) and minimum in B<sub>2</sub> group (1.60 ± 0.03kg/kg bird). Santiago *et al.* (2010) suggested that supplementation with corn and soybean meal based diets improves FCR of broilers without affecting body weight. Overall average of FCE in F<sub>3</sub> treatment was 1.89kg/kg bird (Table 1). Feed intake, body weight gain and feed conversion efficiency for all the three treatment groups of feed were found to be highly significant ( $P < 0.01$ ) in the three broiler-strains (Table 2). Zanella *et al.* (1999) observed that addition of Avizyme to corn-soybean based broiler diet improved the feed efficiency by 2.2 per cent. Findings of this research were similar to the observations reported by Rajendran *et al.* (1990) for two groups of broilers with average feed conversion ratio was 2.64 and 2.41. Reddy *et al.* (2010)

indicated that low energy corn soya diet enhance the performance of broilers with improve feed conservation ratio. However, slightly lower values of FCE have been reported by Sinha and Pandita (1994), Gupta *et al.* (1992) in their findings. The mortality amongst the chicks was recorded as 3 to 4 per cent, which was statistically non-significant.

## CONCLUSION

It was therefore concluded, from the above results that feeding with Soybean and Maize as broiler mash in the ratio of 3:7 given beneficial results in all three strains of broiler without any adverse effect on growth and development and gives economic feasibility to the poultry farmers. Unlike ruminants, which can thrive on forages, poultry require a balanced diet. Therefore, poultry diets must contain proper ingredients at the proper levels for productive chickens and this research will help to identify adequate substitutes that are locally produced and will support poultry growth in Gorakhpur region.

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