

## Effect of Replacing Maize with Bajra (Pearl Millet) on the Performance of Broilers

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### Abstract

In the Corn Soya based diet the effect of quantitatively replacing 0 (T1), 25(T2), 50(T3), per cent of dietary maize with bajra (pearl millet) was investigated for broilers. Each one of the three diets was offered as much ad libitum to two replicates (25 birds per replicate), the growth performance of broiler birds during 0-42 days of age was studied. The chicks under T3 group grew significantly faster ( $P < 0.01$ ) than T1 and T2 group and Chicks under T2 grew significantly faster ( $P < 0.01$ ) than T1 group. It was observed that the feed conversion ratio was superior in T1 followed by T2 and T3 respectively with significant ( $P < 0.01$ ) differences amongst the treatment groups. It was observed that the chicks under T3 group consumed significantly ( $P < 0.01$ ) more feed than T2 and T1 groups during the experimental period respectively. There was no mortality in all of the dietary treatments through out the experiment. Findings of the present study suggest that bajra can replace 25 – 50 per cent of maize in the broiler ration without affecting the performance of the broilers, but at the same time feed conversion ratio was poor for bajra incorporated feed T3 and T2 than T1.

**Keywords:** bajara, maize, pearl millet, broiler, performance, F.C.R.

### Introduction

The urgency of the world food problem has presented a challenge to nutritionist to investigate the possibilities of utilizing other potential energy sources because, the major portion of the maize crop is diverted for other purposes such as bio fuel, brewery and starch industries and human consumption. One of the cheap energy sources available for replacing maize in poultry ration is bajra (pearl millet). The bajra grain with 11.5 per cent crude protein and 2900 kcal metabolizable energy resembles maize (9 per cent crude protein and 3330 kcal M.E.) in most of the qualities. Thus bajra may provide major replacement of maize in poultry feed as there is striking similarities in nutrient composition of both grains (Prasad and Panwar, 1997).

Bajra is the most widely grown species of millet, grown in India and Africa since prehistoric times. It is now generally accepted that pearl millet originated in Africa and that it was introduced into India from there. Bajra is well adapted to production systems characterized by low rainfall, low soil fertility, and high temperature, and thus can be grown in areas where other cereal crops, such as wheat or maize, would not survive. The Bajra (*Pennisetum glaucum*) protein has

more lysine, methionine and tryptophan than other food grains. Also it is recognized as low fat diet. Bajra contains thiamin (Vitamin B1) and iron.

In our effort at revealing the potentials of bajra which could replace popular energy source like maize in poultry ration, we report in this work utilization of bajra by replacing maize at particular levels in broiler rations with respect to weight gain, feed consumption and feed conversion ratio.

### Materials and Methods

One hundred and fifty (150) day old, VENCOBB (straight run) chicks were procured from venkateshwara hatcheries pvt. Ltd., pune. At arrival chicks were weighed, leg banded and randomly distributed in three different treatments with two replicates. Each replicate contained 25 birds viz 50 birds per treatment. At arrival birds were given fresh water and feed ad libitum. The standard managemental practices were performed for all groups. During the experiment period the birds were immunized against ranikhet disease and infectious bursal disease.

Standard maize-soybean meal based broiler starter and finisher diet (T1) was formulated as per BIS (1992).maize was replaced with bajra quantitatively

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Table-1. Composition (% ,DM basis) of experimental broiler starter (0-4 wks) and finisher (5-6 wks) diets.

Ingredients	Diet		
	T1	T2	T3
<b>Starter ( 0-4 Weeks )</b>			
Maize	50.0	37.5	25.0
Bajra	—	12.5	25.0
Constants *	50.0	50.0	50.0
<b>Finisher (5-6 Weeks)</b>			
Maize	58.0	43.5	29.0
Bajra	—	14.5	29.0
Constants+	42.0	42.0	42.0
<b>Nutrient composition of starter diet (calculated)</b>			
ME ( kcal/kg)	2900	2816	2732
Crude Protein ( %)	21.527	21.94	22.352
M+C (%)	0.922	0.885	0.911
Crude Fibre( %)	4.59	5.056	5.519
Lysine (%)	1.080	1.078	1.075
Methionine( %)	0.458	0.480	0.502
Calcium (%)	1.167	1.135	1.104
Available P. (%)	0.418	0.423	0.428
Ether Extract (%)	3.44	3.377	3.314
<b>Nutrient composition of finisher diet (calculated)</b>			
ME (kcal/kg)	2987	2890	2792
Crude Protein (%)	19.032	19.511	19.989
M + C (%)	0.763	0.793	0.824
Crude Fibre (%)	4.106	4.642	5.179
Lysine (%)	0.976	0.974	0.972
Methionine (%)	0.407	0.432	0.458
Calcium (%)	1.159	1.123	1.087
Available P. (%)	0.410	0.416	0.421
Ether Extract (%)	3.507	3.435	3.362

\* Soybean Meal 24 %, Mustard Ext. 1.5 %, GNC 3.5 %, Corn Gluten 5 %, Rice Polish 10.525 %, Di Calcium Phosphate 1.8 %, Lime Stone Powder 0.6 %, Trace Mineral Premix 0.5 %, Vitamin Premix 1 %, Salt Premix 0.4 %, Soda Premix 0.4 %, Methionine 0.09 %, Lysine 0.08 %, Choline Chloride Pmx.0.3 %, etc.

+ Soybean Meal 20 %, GNC 2 %, Corn Gluten 5 %, Rice Polish 9.62 %, Di Calcium Phosphate 1.8 %, Lime Stone Powder 0.7 %, Trace Mineral Premix 0.5 %, Vitamin Premix 0.9 %, Salt Premix 0.4 %, Soda Premix 0.4 %, Methionine 0.07 %, Lysine 0.14 %, Choline Chloride Pmx.0.3 %, etc.

\* + Trace mineral premix and vitamin premix of starter and finisher rations were prepared as per standard specifications and requirement of broiler birds.

Table-2. Effect of replacing maize with bajra on weight gain, feed intake, and F.C.R. of broilers at the end of 6th week.

Parameter	Diets		
	T1	T2	T3
Avg Initial Body Wt. (gms)	47	47	47
Weight Gain (gms)	1550	1598	1632
Feed Intake (gms)	3480	3600	3897
Avg. F.C.R.	2.20	2.24	2.31

at the level of 25 (T2), 50 (T3) per cent, respectively (Table-1) from the control diet. each of the three experimental diets were offered ad libitum as mash to two replicates of commercial chick broilers day old, with each replicate comprising 25 chicks of mixed sex. For composition of ration, the feed ingredients were purchased from local market and the experimental feed was prepared as mash.

The chemical analysis of the feed viz dry matter, nitrogen and crude protein, energy, crude fiber and mineral composition were carried out according to A.O.A.C (1981) methods. The body weight of individual birds, feed intake, and feed efficiency were recorded at weekly interval while mortality of the birds recorded through out the experiment. The data collection during the experiment were subjected to stastical analysis by one way analysis with two factors as per Panse and Sukhatme (1986).

#### Results and Discussion

The calculated composition of bajra was 10.91 per cent C.P., and M.E. 3 mcal/kg which are similar to the findings of Fancher et al (1987), Banerjee et al (1998). The proximate composition of experimental starter and finisher ration is given in table 1. The C.P. of the different starter diets ranged between 21.527 to 22.352 per cent in accordance with the replacement of maize by bajra in graded levels. The replacement of grains was further reflected in M.E. content of experimental starter diet ranging from 2900 kcal/kg to 2732 kcal/kg through T1 to T3. The C.P. and M.E. of finisher ration ranged from 19.032 % to 19.989 % and 2987 to 2792 kcal/kg of M.E. respectively which are similar to verma et al (2001).

The growth performance of experimental birds was assessed by recording the weekly body weight of birds. The average weekly cumulative body weight gms/bird and weekly gain in body weight was recorded. It was observed that the birds under group T3 grew faster than T2 and T1. The ANOVA of the growth data indicates that the chicks under group T3 grew significantly faster than T2 and T1 ( $P < 0.01$ ), the chicks under T2 grew significantly faster than T1 ( $P < 0.01$ ). It may be seen from table 2 B that the replacement of maize by bajra grains in experimental diet resulted in increased body weights of experimental birds, Reddy et al (1989), Thakur et al (1992).

The feed consumption of experimental chicks was recorded at weekly intervals (Table no.2 B). The average feed consumption per bird up to 6 th week in different groups ranges from 3.48 kg. To 3.89 kg. The chicks under T3 consumed significantly ( $P < 0.01$ ) more

feed than all other groups, where as chicks under T2 consumes significantly ( $P < 0.01$ ) more feed than T1 (control) group, Reddy and Reddy (1989).

The feed conversion ratio (FCR) of experimental birds was calculated at weekly intervals the average feed conversion ratio is given in table 2 B. It was observed that the FCR was superior in T1 (control) followed by T2 and T3 with significant ( $P < 0.01$ ) differences amongst the treatment groups, (Verma et al.2001), (Rama Rao et al 2001).

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