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Feasibility of Utilization of *Prosopis juliflora* Pods in Broiler Ration

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ABSTRACT

An experiment was conducted on 240 'Vencobb' broiler chicks raised in deep litter system and randomly allotted to three dietery treatments (80 in each) viz., (1) 0 per cent (2) 5 per cent and (3) 10 per cent levels of *Prosopis juliflora* pods respectively in broiler starter and broiler finisher ration. The weight gain at 6 and 8 weeks of age was at par in all the treatments. Feed intake of birds were not affected by dieatary treatments which resulted in non-significant differences in feed efficiency amongst them. The dressing percentage and other carcass traits also followed the same trend alongwith that of cost of feed. The results suggested that the *Prosopis juliflora* pods can be incorporated in broiler starter and broiler finisher upto 10% level without any adverse effects on performance of broiler.

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INTRODUCTION

The growth rate of birds has excelled over all other livestock species in the last decade along with the escalation of broiler production from 30 million to 200 million between 1980-1990 (Singh *et al.* 1991). But this has been associated with the rise in demand of feed which is estimated to be 11 million tonnes by 2000 AD (Chadha, 1991). To meet this demand and to reduce the feed cost, it is essential to incorporate unconventional feeds in the poultry ration. Many unconventional feeds have been tried as poultry ration but very little information is available on the use of *Prosopis juliflora* pods in poultry diet. *Prosopis juliflora* pods are very good source of enery (75% TDN) with 7.0% DCP, and good palatability (Talpada *et al.* 1979). It's availability is *2.00 lakh* M.T.Year in Gujarat and *10.00 lakh* M.T./Year in India (Anon. 1992-93). Hence present study was undertaken to know feasible and economic level of incorporation of *Prosopis juliflora* pods in broiler starter and finisher ration.

MATERIALS AND METHODS

240 straight run day old 'Vencobb' chicks of same hatch were randomly allotted to three treatments with 80 chicks in each. Each treatment had four replications. The treatments were as follows :

T_1 : Control 0 per cent level of *Prosopis juliflora* pods.
T_2 : 5 per cent level of *Prosopis juliflora* pods.
T_3 : 10 per cent level of *Prosopis juliflora* pods.

Details regarding proportions of feed ingredients used are given Table 1. Feeding

TABLE 1

Formulation and chemical composition of experimental diets.

Sr. No.	Ingredient	Proportion (per cent)						*Prosopis juliflora* pods
		Broiler starter			Broiler finisher			
		T_1	T_2	T_3	T_1	T_2	T_3	
1.	Maize	45	44	42.5	50	52	49.5	
2.	Maize gluten	18	18	18	15	17	19.5	
3.	Rice polish	10	6	2	12	5	2	
4.	*Prosopis juloflora* pods	0	5	10	0	5	10	
5.	Deoiled groundnut cake	10	10	10	7	5	2	
6.	Fish meal	11	11	11	9	9	9	
7.	Tallow	3	3	3.5	4	4	5	
8.	Mineral mixture	3	3	3	3	3	3	
	Chemical composition (% on DM basis) for three experimental groups							
	C. Protein	22.60	22.09	21.96	21.71	22.12	21.06	13.71
	E. Extract	9.50	10.57	11.36	12.12	12.94	12.58	3.64
	C. fibre	4.66	4.56	3.68	4.43	3.76	3.66	15.99
	NFE	51.20	51.54	51.94	50.67	50.34	52.07	60.49
	Ash	12.04	11.24	11.06	11.07	10.84	10.63	6.17
	Silica	3.34	2.89	1.93	3.32	2.97	1.99	1.11
	P	0.41	0.31	0.31	0.43	0.36	0.40	0.13
	Ca	1.06	0.76	1.07	1.06	0.95	1.03	0.49
	Calculated CP (%)	22.46	22.46	22.41	18.99	19.09	18.96	
	Calculated ME (Kcal/kg)	2881.60	2846.60	2832.60	2995.40	2961.40	2995.90	
	Cost (Rs./100 kg)	444.30	433.03	429.21	449.46	439.05	446.21	

standards (ISI, 1979) were followed to meet the energy and protein requirements of the birds reared under starter and finisher phase. All the treatment feeds were fortified with adequate vitamin supplement and coccidiostate.

The birds were raised in deep-litter system with 1.32 sq. ft. floor space per bird. The pens were properly sterilized before conducting the experiment. *Bajra* husk was used as litter material. In each pen, 100 watt electric bulb was provided to maintain brooding temperature ground 35°C. till it reaches at the end of 4th week. Light was provided 24 hours to achieve maximum feed consumption in linear feeder trough with 2.5 cms linear space per bird for first 3 weeks, 4.4 cms linear space per bird from 4 to 6 weeks and 13.5 cms linear space per bird during 7 and 8 weeks. Plastic water trough were provided at the rate of 0.5 and 1.0 cm linear space for the first two weeks and 3 to 8 weeks, respectively.

During the 8 weeks of experimental period, the body weight were recorded at weekly interval. The feed intake was recorded daily by weighing in the morning and evening feed in feeders. Fortyeight birds (sixteen in each treatment) were slaughtered by 'Halal' method to study the carcass traits. The data were analysed statistically as per procedure of Snedecor and Cochran, (1987).

RESULTS AND DISCUSSION

The chemical composition of feeds are given in Table 1. The *Prosopis juliflora* pods contained 13.71% CP and 15.99% CF. The ME content was 2200 kcal/kg. Thus, it is a good source of energy.

Effect of weight gain

The average total body weight gain during the experiment is presented in Table 2. It was 1553.56, 1552.62 and 1498.23 g with corresponding values of 27.74, 27.72 and 26.75 g daily gain in weight under T_1, T_2 and T_3 respectively. Weight gain (g/d) was found slightly lower as compared to BIS (1992) standards. Slight reduction in daily weight gain has been reported in broiler fed unconventional cake mixture (Haque *et al.* 1991) and unconventional feed mixture with penicillium mycellium residue (Gianchand, 1969).

Feed intake and feed efficiency

Feed consumption during starter and finisher phase was observed at par with the average total intake of 2784.36, 2885.59 and 2787.56 g of starter mash and 1746.69, 1763.87 and 1707.20 g of finisher mash per bird respectively under T_1, T_2 and T_3 groups. The total feed intake was 4531.05, 4649.26 and 4494.76 g per bird in T_1, T_2 and T_3, respectively with the corresponding values of 80.94, 83.12 and 81.44 g per bird of average daily feed intake. The birds under T_2 consumed more feed compared to T_1 and T_3 but the difference was non significant. The results suggested that *Prosopis juliflora* pods are quite palatable and it has no adverse effect on feed intake.

Gianchand (1969) reported lower feed consumption in broilers fed mango seed kernel or mixture of unconventional feeds. But Patel (1995) observed non-significant effect of corn steep liquor on feed intake by broilers. The average feed efficiency (kg feed/kg gain) were recorded to be 2.92, 2.99 and 3.01 during starter phase and

TABLE 2

Average weight gain, feed intake, feed efficiency and carcass characteristics of birds under study.

Particulars	Treatments		
	T_1	T_2	T_3
Av. Body weight (g)			
Initial	48.08 ± 0.41	47.29 ± 0.31	48.89 ± 0.51
Final	1601.64 ± 14.92	1599.91 ± 17.64	1547.12 ± 28.58
Gain in weight	1553.56 ± 26.04	1552.62 ± 22.37	1498.23 ± 24.66
Daily weight gain	27.74 ± 0.30	27.72 ± 0.31	26.75 ± 0.50
Av. Feed intake (g)			
0-8 weeks	4531.05 ± 66.78	4649.26 ± 49.51	4494.76 ± 61.72
Daily intake (g/d)	80.94 ± 1.17	83.12 ± 00.94	81.44 ± 1.13
Feed efficiency (kg feed/kg gain)			
0-8 weeks	2.92 ± 0.02	3.01 ± 0.04	3.04 ± 0.04
Carcass characteristics			
Av. carcass wt. (g)	1273.50 ± 45.79	1288.88 ± 47.90	1331.12 ± 40.77
Dressing %	64.70	65.07	64.63
Av. dressed wt. (g) with giblet	1077.72	1084.87	1123.06
Wt. of heart (g)	8.22	7.72	8.59
Wt. of spleen (g)	2.81	2.59	3.00
Wt. of liver (g)	39.44	40.62	42.33
Wt. of Gizzard (g) with lining	36.38	34.81	36.72
Economics of feeding Feed Cost (Rs.)			
0-6 weeks	12.37	12.50	11.96
0-8 weeks	20.22	20.24	19.58
Rs. per kg gain (0-8 weeks)	13.02	13.04	13.33
Av. return over feed Cost Rs.	15.02	14.98	14.45

2.88, 2.98 and 2.94 during finisher phase with the overall average of 2.92, 3.1 and 3.04 under T_1, T_2 and T_3, respectively. The treatment differences were non-significant. Similar results (2.69 to 3.06) have been reported by Singh *et al.* (1991) in broiler chicks raised on mixture of unconventional cakes.

Carcass characteristics

The carcass study revealed non significant treatment differences for all the traits. The average carcass weight was 1273.50, 1288.88 and 1331.12 g whereas the values for dressing percantage were 64.70, 65.07 and 64.63 in treatment groups T_1, T_2 and T_3, respectively. The values were at par which suggested that *Prosopis juliflora* pods are not having any adverse effect on dressing percentage upto 10 per cent level. The weights of different edible organs were also non significantly different amongst the treatments. Haque *et al.* (1991) and Patel (1995) also reported non-significant effect of unconventional cake mixture and corn steep liquor, respectively on dressing percentage of broilers which supports the present findings.

Economics of feeding

The average cost of feeding broilers was found to be Rs. 12.37, 12.50 and 11.96 during starter phase and Rs. 20.22, 20.24 and 19.58 for the entire rearing period (0-8 weeks under T_1, T_2 and T_3, respectively. The cost of feed (Rs./kg gain) was realised to be Rs. 13.02, 13.04 and 13.33 whereas the cost of meat was Rs. 18.52, 18.66 and 17.79 per kg meat respectively under T_1, T_2 and T_3. The economics of raising the broiler chicks upto 8 weeks revealed non significant treatment differences. The net returns overfeed cost were found to be Rs. 15.02, 14.98 and 14.45 in T_1, T_2 and T_3, respectively and treartment differences were non significant. However, Jadhao *et al.* (1994) observed higher values and Vala *et al.* (1996) found lower values than the values observed under the present study for net return over feed cost with different levels of sand in broiler and corn steep liquor in chicks, respectively.

The present results indicated that *Prosopis juloiflora* pods can be incorporated upto 10% level in the ration of broilers without any adverse effect on weight gain and carcass characteristics.

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