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Research Article

INFLUENCE OF PLAN OF FEEDING ON STUDY OF FEEDING AND AGONISTIC BEHAVIOUR OF CROSSBRED, INDIGENOUS AND EXOTIC PIGS

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ABSTRACT
An experiment was conducted to compare the merits and demerits of crossbred pigs over indigenous and exotic pigs with respect to growth and to study the economic feasibility of rearing crossbred pigs. Three groups of twelve weaned female piglings each belonging to indigenous (Desi), Large White Yorkshire (LWY) and crossbred (CB) (LWY × Desi) of Centre for Pig Production and Research, Mannuthy were selected as uniform as possible with regard to age and body weight. Animals in each breed group were randomly divided into two equal dietary treatment groups of six. Treatment group one was fed with a ration specified by ICAR and treatment group two with a ration containing 10 per cent less crude protein than ICAR ration. All the pigs were fed iso - caloric ration as per ICAR recommendation. Statistically significant difference was observed between the feeding behaviour of Large White Yorkshire and cross bred pigs. The agonistic behaviour of pigs showed highly significant difference ($P<0.05$) between the breeds. The number of ear biting during the feeding time revealed no significant difference ($P>0.05$) between the treatment groups but there was a highly significant difference ($P<0.01$) between the breeds. Large White Yorkshire pigs were the most aggressive or excited followed by crossbreds and Desi pigs in that order.

Keywords: *Crossbred, Indigenous, Exotic Pigs, Feeding*

INTRODUCTION
Pork has higher energy value than beef or mutton. In India pig rearing is still not in a satisfactory state and almost entirely in the hands of people with little resources who continue to follow the primitive methods of rearing. There are three basic genetic groups of pigs in our country i.e., desi pigs, exotic pigs and a non- standardized crossbred of these two. The common Indian desi pig is a scrub animal, slow grower, small sized and producer of small litters. These are rich in genetic variability and are endowed with many positive aspects like disease resistance and tolerance to climatic variables. But these animals are poor in reproductive and productive traits.

Exotic pigs are good converters of feed with low mothering ability. Recognizing the merits and potential of exotic pigs as a source of animal protein, the Government of India is paying considerable attention in the development of pig industry. A number of pig production centres have been established in several states and the farmers are being educated on pig raising on scientific lines.

There are not many reports comparing exotic breeds like Large White Yorkshire with indigenous desi pigs and the available reports indicate a significantly lower growth rate and a higher production cost in indigenous stock when compared to Large White Yorkshire pigs (Sasendran and Rajagopalan, 1981, 1982).

While crossing the desi pigs with exotic animals, a substantiate increase in both productive and reproductive performance as well as disease resistance in the resultant crossbreds is yet to be ascertained.

Efficiency of production depends on the successful interaction of several factors. Of these, nutrition is by and large the most important. Protein is one of the most important nutrients required by all classes of Livestock and especially by pig for own body processes as well as to synthesize different products.

Hence, the present study was undertaken with the following objectives and to make suitable recommendations, which can be practiced by farmers.

1. To study the feeding and agonistic behaviour of crossbred, indigenous and exotic pigs.

MATERIALS AND METHODS

Three groups of twelve weaned female piglings each belonging to indigenous (Desi), Large White Yorkshire (LWY) and crossbreds (CB) (LWY × Desi) of Centre for pig Production and Research (CPPR), Kerala Agricultural University, Mannuthy were selected as the experimental animals. Animals for the study were selected as uniform as possible with regard to age and body weight. All the animals were dewormed before the commencement of the experiment and maintained under similar managemental conditions of the farm during the experimental period of 210 days.

Experimental Diets:

The piglings were maintained on two planes of feeding with respect to crude protein (CP) as follows:

A. Treatment I – ICAR recommended Level of crude protein

T1 → G1 – 6 indigenous piglings
T1 → G2 – 6 exotic piglings
T1 → G3 – 6 Crossbred piglings

B. Treatment II – A Low Plane (LP) of 10 per cent less of crude protein with reference to ICAR level.

T2 → G1 – 6 indigenous piglings
T2 → G2 – 6 exotic piglings
T2 → G3 - 6 Crossbred piglings

All the pigs were fed ISO - caloric ration as per ICAR recommendations.

Behaviour of pigs was studied for duration of one hour in a day. The observation on feeding behaviour in pigs was quantified by scores as described (Thomas and Joseph, 1994).

Feeding Behaviour

Sl. No	Description	Score
1.	Excitement, restlessness, eagerness, grunting, gnawing, drooling of saliva etc at feeding	3
2.	Moving around in the pen, grunting, drooling saliva etc.	2
3.	Quiet with casual interest towards feed	1

Competition and aggressive behaviour manifested were noticed during eating. Number of threats and biting were counted during feeding time. The other behavioural observations were noted just before, during and after feeding to find out any change in pattern of behaviour. One group was observed for their behaviour pattern on one day and other five groups were observed on subsequent days. This pattern was repeated. The data were statistically analysed as per the method described by Snedecor and Cochran, (1994).

Table A: Feeding Behaviour of Pigs Fed with Two Different Rations

Score	Treatment I (ICAR) (in Percentage)			Treatment II (10% Less ICAR) (in Percentage)		
	Large White Yorkshire	Crossbred	Desi	Large White Yorkshire	Crossbred	Desi
3	71.43^{a}**	9.52^{b}	2.38^{a}**	42.85^{b}	4.76^{b}	0.00^{b}
2	28.57^{a}**	57.14^{b}**	16.67^{NS}	57.15^{b}	66.67^{c}	14.29^{b}
1	0.00	33.14^{NS}	80.95^{NS}	0.00	28.57^{NS}	85.71^{NS}

Means having the same superscript in a row do not differ significantly
Percentage tested by proportion test (Two factors)
NS- Non significant
**- Significant at 1 per cent

Table B: Agonistic Behaviour of Pigs Fed with Two Different Experimental Rations

Behaviour	Treatment I (ICAR) (in Percentage)				Treatment II (10% less ICAR) (in Percentage)			
	Large White Yorkshire	Crossbred	Desi	Treatment Mean	Large White Yorkshire	Crossbred	Desi	Treatment Mean
Number of threats/day	10.214^{a} ±0.528	9.179^{b} ±0.405	5.143^{c}** ±0.190	2.901**	11.107^{a} ±0.369	10.607^{b} ±0.396	5429^{c} ±0.215	3.045
Number of ear biting /day	2.464^{a} ±0.141	1.500^{b} ±0.096	0.643^{c}** ±0.092	1.383^{NS}	2.571^{a} ±0.195	1.571^{b} ±0.130	0.714^{c} ±0.087	1.408

Figures having the same superscript in a row do not differ significantly
NS- Non significant
**- Significant at 1 per cent

Table-I Cost of Production Per kg Live Weight of Large White Yorkshire, Crossbred and Desi Pigs Fed with Two Different Rations

Observation	Treatment I (ICAR)			Treatment II (10% less ICAR)		
	Large White Yorkshire	Crossbred	Desi	Large White Yorkshire	Crossbred	Desi
Number of animals	6	6	6	6	6	6
Total initial body weight (kg)	53.5	49	39	53	48	38.7
Total final body weight (kg)	483.5	373	282	434	354	237.3
Total body weight gain (kg)	430	324	243	381	306	198.6
Total feed intake (kg)	1844.91	1933.65	1482.21	1785.33	1789.47	1384.11
Total feed cost (Rs)	13218.45	13859.17	10624.55	12344.23	12376.59	9579.15
Cost of feed per kg (Total feed cost/total feed intake)	7.16	7.16	7.16	6.91	6.91	6.91
Feed conversion efficiency	3.81	5.18	5.25	4.11	5.05	5.83
Cost of production on feed basis (Rs.) (FCR× Cost of feed/kg	27.27	37.08	37.59	28.40	34.89	40.28
Cost of production/kg live body weight (Rs.)*	36.36	49.44	50.12	37.86	46.52	53.70
Overall treatment mean	45.30			46.02		

*- Under the assumption that cost of feed accounts for about 75 per cent of total cost of production in pigs (Joseph Mathew, 1997)

RESULTS AND DISCUSSION

Feeding Behaviour

Feeding behaviour score of pigs which is a measure of manifestation of appetite in feeding is shown in Table A. Statistically significant difference was observed between the feeding behaviour of the Large White Yorkshire fed with two different rations. In ICAR ration the score three was 71.43 per cent observed and the score two 28.57 per cent whereas in 10 percent less crude protein than ICAR ration it was 42.85 57.15 per cent respectively.

The crossbred pigs fed with ICAR ration showed score two for 57.14 per cent whereas in 10 percent less crude protein than ICAR ration 66.67 per cent. The difference in the behaviour was statistically significant ($P<0.01$).

In both the treatment groups, Desi pigs showed the behavioural score one and the difference noted was not statistically significant.

This is in agreement with the observation of Labroue *et al*., (1995) and Joseph (1997) who had reported difference in feeding behaviour in Large White Yorkshire pigs.

Agonistic Behaviour

In the present study, the agonistic behaviour was measured by counting the number of threats and ear biting incidence during the feeding time (Table B).

Statistically the results showed highly significant difference ($P<0.01$) in number of threats between the treatment groups (Table B) and between the breeds.

Number of ear biting during the feeding time revealed no significant difference ($P>0.05$) between the treatment groups and highly significant difference ($P<0.01$) between the breeds. During feeding time, the animals tried to displace the other animals from the manger.

This activity was noticed from second month onwards. Before feeding they huddled together for sleeping. Immediately after feeding the animal from ICAR fed ration group used to go for sleeping and in the other group some animals tried to “chase” mount and attack the other animals.

All the pigs marked a definite area either near waterer near the wallowing tank for defecation and urination.

Large White Yorkshire pigs were the most aggressive or excited followed by Crossbred and Desi pigs. The result obtained in the study is in agreement with Dinesh (2000).

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