

Research Article

INFLUENCE OF CRUDE PROTEIN ON COMPARATIVE STUDY OF GROWTH PERFORMANCE OF CROSS BRED, 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 \times 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.

The protein level in the ration had a moderate influence on the performance of grower pigs. There was a trend in favour of full ICAR ration with respect to the parameters like growth rate, feed conversion efficiency and average daily weight gain. Even though, there was no significant difference ($P>0.05$) between the two dietary regimes there was highly significant difference ($P<0.01$) between the breeds. A clear breed difference was noticed between Large White Yorkshire and Desi pigs with respect to traits such as feed intake, body weight, body measurements, average daily body weight gain and feed conversion efficiency. But there was no significant difference ($P>0.05$) between crossbreds and Desi Pigs in average daily body weight gain and feed conversion efficiency. The cost of production per kg live body weight was found to be less (Rs. 45.30) in ICAR ration than 10 per cent less crude protein ration (Rs.46.02) due to higher feed efficiency and better growth rate. The overall result obtained during the course of present study is that the unit cost of production is less for animals maintained on ICAR ration. The present study also revealed that Large White Yorkshire had higher growth rate, better feed conversion efficiency, and average daily weight gain.

INTRODUCTION

Pigs are ideal suppliers of good quality meat. Pigs excel all other meat producing animals except well kept broiler. Swine can effectively utilize agricultural by products and many other waste materials. Compared to other meat animals pigs yield higher dressing percentage. 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 larger in size with superior feed efficiency. These animals are good converters of feed with low mothering ability. They outdo desi pigs in growth rate and carcass characteristics. 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 centers 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

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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.

Growth rate, feed efficiency and carcass quality are vital factors influencing the cost of fattener production in swine industry. These factors are related to live weight, age, quality and quantity of feed, genetic potential and environmental factors. Feed efficiency is maximum at the early stages of growth and it decreases with increasing age and live weight. Efficiency of production depends on the successful interaction of several factors. Of these, nutrition is by and large the most important. The efficiency of the pig in this respect can be divided into different categories on the following basis (i) biologic efficiency (ii) economic efficiency. When biologic efficiency is calculated, the feed consumed and the weight gained alone is considered. On the other hand, when economic efficiency is assessed, units of feed consumed, labour charges and equipment charges involved are also taken in to account. 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 formers.

To compare the merits and demerits of cross bred pigs over indigenous and exotic pigs with respect to growth characteristics.

To study the economic feasibility of rearing crossbred pigs.

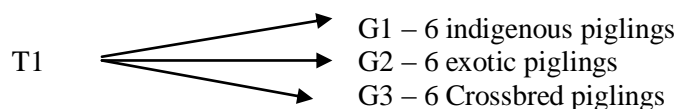
MATERIALS AND METHODS

Three groups of twelve weaned female piglings each belonging to indigenous (Desi), Large White Yorkshire (LWY) and crossbreds (CB) (LWY \times 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 managerial conditions of the farm during the experimental period of 210 days.

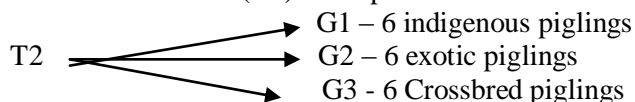
Experimental Diets

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

Treatment I – ICAR recommended Level of crude protein



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



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

The body weight and body measurements were recorded at fortnightly intervals and average daily body weight gain and feed conversion efficiency were estimated in each breed. The data were statistically analyzed as per the method described by Snedecor and Cochran, (1994).

RESULTS AND DISCUSSION

In Livestock production growth is very important since it is the basis for meat, milk etc. Growth represented by an increase in size and weight with age and development, is thus of great economic significance.

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Table1: Adjusted mean body weight of three breeds of pigs fed with two different rations

| Fortnigh ts | Adjusted Mean Body Weight (Kg) | | | | Treatment 11 (10% less ICAR) | | | |
|----------------|---------------------------------|---------------|----------------|----------------------|---------------------------------|---------------|--------------|--------------------|
| | Treatment I (ICAR) | | | | Treatment 11 (10% less ICAR) | | | |
| | Large White Yorkshir e | Crossbre d | Desi | Treatme nt Mean | Large White Yorkshir e | Crossbre d | Desi | Treatme nt Mean |
| 1. | 10.943 a | 11.299 a | 10.981 a | 11.074 ^{NS} | 10.782 a | 10.894 a | 9.269 a | 10.315 |
| 2. | 14.056 a | 13.264 a | 13.768 a | 13.696* | 12.807 a | 13.212 a | 10.97 6 b | 12.332 |
| 3. | 18.860 a | 15.249 a | 18.230 a | 17.547** | 16.032 a | 15.644 a | 15.01 8 a | 15.565 |
| 4. | 24.170 a | 22.946 ab | 20.168 b** | 22.428** | 18.272 a | 22.405 b | 17.78 9 a | 19.489 |
| 5. | 28.424 a | 26.807 a | 24.394 b** | 26.541** | 20.620 a | 25.069 b | 21.60 3 a | 22.431 |
| 6. | 38.599 a | 31.113 b | 28.691 b** | 32.801** | 27.736 a | 28.933 a | 25.34 4 a | 27.338 |
| 7. | 43.584 a | 35.350 b | 31.705 b** | 36.879 ^{NS} | 35.147 a | 35.691 a | 28.19 1 b | 33.009 |
| 8. | 52.118 a | 40.606 b | 36.136 b** | 42.953 ^{NS} | 43.989 a | 40.667 a | 32.73 4 b | 39.130 |
| 9. | 56.066 a | 48.223 b | 41.092 c* | 47.725 ^{NS} | 49.036 a | 46.017 a | 37.06 5 b | 44.775 |
| 10. | 61.030 a | 57.860 b | 46.179 b* | 52.387 ^{NS} | 54.697 a | 49.952 a | 42.01 3 b | 49.613 |
| 11. | 66.132 a | 56.346 b | 50.164 b* | 56.565 ^{NS} | 59.943 a | 53.398 ab | 46.18 4 b | 54.158 |
| 12. | 70.926 a | 60.905 b | 54.585 ab** | 61.331 ^{NS} | 65.154 a | 58.483 a | 48.94 7 b | 58.335 |
| 13. | 77.093 a | 67.440 b | 57.973 c** | 65.672 ^{NS} | 71.518 a | 61.949 b | 57.36 1 c | 63.439 |
| 14. | 82.111 a | 70.219 b | 60.720C* * | 69.154 ^{NS} | 77.612 a | 64.632 b | 53.45 7 c | 67.096 |

Means having the same superscripts in a row do not differ significantly

NS - Non Significant

* - Significant at 5 per cent

** - Significant at 1 per cent

From Table 1 it can be seen that adjusted mean body weight of Large White Yorkshire and crossbreds were different at different stages of growth maintained on the two dietary regimes for a period of seven months. The animals used in this study showed a progressively increasing weight from weaning to 14th fortnight. This nature of growth is in agreement with the pattern of growth reported by Brody, (1945). and Maynard et al., (1979). They have reported an increase in body weight from birth in a way characteristic to the species. Plan of feeding was found to affect the performance of different breeds.

Highly significant difference ($p < 0.01$) was noticed during the growing phase between the high protein ration (13.69 to 32.80kg) and low protein ration (12.33 to 27.33kg). Even though numerical difference

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was noticed between these treatments groups during the finishing period it was not significant statistically.

The results obtained during the course of this study are in agreement with the results reported by Meade *et al.*, (1969). Who found improvement in live body weight gain in pigs fed on higher levels of protein in the initial growth period? Similarly, Davey, (1976) and Christian *et al.*, (1980). Observed reduction in growth rate of Duroc and Yorkshire pigs when fed with low protein diet.. The trend continued during the finishing phase also even though the differences were not significant. Das, (1997) noticed higher body weight during the finishing phase in crossbred female pigs fed with diet containing high protein.

Body weight at different stages of growth of Desi pigs were significantly lower ($P < 0.01$) than Large White Yorkshire and crossbred pigs. Similar results were reported by Saseendran and Rajagopalan (1982) AICRP (1999), Sharma *et al.*, (1992) and Suraj (2000).

The growth studies indicated that higher body weight in Large White Yorkshire followed by crossbred and Desi pigs in all fortnights. Similar finding has been observed by Chatterjee. The overall result obtained during the course of present study is that the unit cost of production is less for animals maintained on ICAR ration. The present study revealed that Large White Yorkshire had higher growth rate, better feed conversion efficiency and average daily weight gain when compared to Crossbreds and Desi pigs.

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