EFFECT OF DIFFERENT FEEDING SYSTEMS ON GROWTH PERFORMANCE AND CARCASS TRAITS OF GROWING AND FINISHING PIGS

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Received 29-10-2013 Accepted 23-11-2013

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ABSTRACT

The study was carried out with twenty four Large White Yorkshire weaned piglets to find out the effect of different feeding regimes on growth performance of pigs. The piglets at weaning were randomly divided into four groups of six each. The first group (T_1) fed with 100 per cent concentrate and the same was replaced on DM basis with hostel food waste at 50 per cent level (T_2) , the third group (T_3) 50 % concentrate with 25 % swill and 25 % Hedge Lucerne and the fourth group (T_4) was fed with 50 % swill, 25 % concentrate and 25 % Hedge Lucerne . A significantly ($P<0.01$) higher weight gain and average daily gain from weaning to seven months of age were found in T_2 (59.01 ± 1.32 kg and 393.00 ± 58.28 gm). Similarly the feed conversion efficiency was also better in T_1 (3.60 ± 0.15) than the other groups. The slaughter and carcass weight were significantly ($P<0.01$) higher in T_2 group (72.83 ± 4.08 and 52.50 ± 7.75 kg) than the other groups. The T_2 group recorded significantly ($P<0.01$) higher back fat thickness and loin eye area.

KEY WORDS : Feeding systems, Pig, Growth, Carcass traits

INTRODUCTION

In organized farms, pigs are kept in modern sheds and reared on concentrate feed. Pork is an important source of high quality animal protein. Mutton, beef and chicken meat alone cannot meet the animal protein requirements of the growing population. In this context, the quick growing multiparous pig is one of the best choice to meet the demand for animal protein. In swine production, the feed costs about 75 per cent of the total expenditure. The modern technology of pig feeding consists of meeting the biological needs with proper combination of feed ingredients and locally available by-poducts to yield pig meat at cheaper cost. The feed cost may be reduced by inclusion of organic wastes from animal and plant origin. The swill feeding practice is found cost effective and introduction of legumes in swine feed is scanty. Hence this study was conducted to assess the growth and carcass traits of pigs raised under different feeding regimens to suggest suitable feeding methods to the pig farmers.

MATERIALS AND METHODS

An experiment was conducted at swine unit, Livestock farm, Department of Livestock Production and Management, Veterinary College and Research Institute, Namakkal to find out the effect of different feeding regimes on growing pigs. A total of twenty four Large White Yorkshire weaned piglets (56 days) were selected and the piglets were randomly divided into four groups of six each. The first group (T_1) fed with 100 per cent concentrate and the same was replaced on DM basis with hostel food waste at 50 per cent level (T_2), the third group (T_3) 50 % concentrate with 25 % swill and 25 % Hedge Lucerne and the fourth group (T_4) was fed with 50 % swill, 25 % concentrate and 25 % Hedge Lucerne. The animals were maintained in the uniform environment and management conditions. The feed intake was recorded and feed conversion efficiency was

calculated. The piglets were weighed at start of the experiment and at monthly intervals up to 7th month of age. From that overall weight gain, average daily gain was calculated.

From each group three males were slaughtered following the standard procedures. The carcass length was measured from the anterior edge of aitch bone to middle of the first rib. Back fat thickness (BFT) was estimated as an average of the measurements taken opposite to the 1st rib, the last rib and last lumbar vertebrae. Loin eye area of the longismus dorsi muscle was measured by cutting the carcass in between 10th and 11th vertebrae. The area was traced on butter paper and then calculated by plotting the traced surface on graph paper. The collected data were analysed as per the method suggested by Snedecor and Cochran (1989).

RESULTS AND DISCUSSION

Feed intake and efficiency

From the table1 it can be observed that the difference in daily feed intake on dry matter basis was statistically vary between the treatment groups, it was significantly (P<0.01) higher in hostel food waste at 50 per cent level (T_2) fed group (1.46 ± 0.03 kg) than the other groups and lowest in concentrate fed group (1.23 ± 0.09 kg). This finding was in agreement with Ramesh *et al*.(2012) who observed daily feed intake was significantly higher in 50 per cent swill fed group. But this result was in contrast with Tensingh Gnanaraj (2001) who observed no significant difference in feed intake

Table 1 . Mean ± SE of growth and carcass traits of Large White Yorkshire Pigs under different feeding regimens

Parameters	T_1	T_2	T_3	T_4	F value
Growth traits					
weight gain from weaning to seven months of age(kg)	51.76 ± 2.64 ^{ab}	59.01 ± 1.32 ^{c}	49.69 ± 5.44 ^{a}	56.83 ± 5.76 ^{b}	8.852**
Average daily gain (gm)	344.66 ± 11.91 ^{ab}	393.00 ± 58.28 ^{c}	331.00 ± 24.76 ^{a}	378.5 ± 25.71 ^{b}	8.755**
Dry matter intake (kg)	1.23 ± 0.00 ^{a}	1.46 ± 0.00 ^{c}	1.30 ± 0.00 ^{a}	1.36 ± 0.00 ^{b}	28.66**
Feed conversion efficiency	3.60 ± 0.15 ^{a}	3.74 ± 0.15 ^{a}	3.93 ± 0.07 ^{a}	3.60 ± 0.04 ^{a}	1.388
Carcass traits					
Slaughter weight (kg)	69.33 ± 0.58 ^{b}	72.83 ± 4.08 ^{c}	63.66 ± 1.08 ^{a}	70.50 ± 4.75 ^{bc}	17.322**
Carcass weight (kg)	48.33 ± 0.08 ^{b}	52.50 ± 1.75 ^{c}	44.76 ± 1.36 ^{a}	50.28 ± 1.03 ^{bc}	12.616**
Dressing percentage	69.79 ± 0.97 ^{a}	71.32 ± 4.42 ^{a}	70.16 ± 0.59 ^{a}	71.50 ± 2.25 ^{a}	1.034
Carcass length (cm)	72.53 ± 1.08 ^{a}	73.33 ± 1.08 ^{a}	72.83 ± 1.08 ^{a}	74.50 ± 2.25 ^{a}	1.95
Back fat thickness (mm)	20.83 ± 0.58 ^{a}	25.33 ± 1.08 ^{c}	20.83 ± 1.58 ^{a}	23.16 ± 1.58 ^{bc}	11.603**
Loin eye area (sq.cm)	21.83 ± 1.08 ^{a}	24.16 ± 0.58 ^{c}	21.83 ± 0.08 ^{a}	23.50 ± 0.25 ^{b}	8.444**

Mean bearing different superscript in a row differ significantly at five per cent level(P<0.01)

fed with different levels of protein in the ration. Whereas the average feed conversion efficiency was better for the pigs fed with 100 per cent concentrate fed group T1 (3.60 ± 0.15) compared to 50 per cent swill fed group T3 (3.74 ± 0.15). This result was supported by Ramesh *et al*. (2012) who reported better feed conversion efficiency for the pig fed with 100 per cent concentrate fed group. This better feed conversion efficiency observed for concentrate fed group might be due to higher protein and energy content than the swill feed. The feed conversion efficiency observed in this study for the pigs maintained on concentrate feed was lower than the reports of Anil *et al*. (2007) who reported that the feed conversion efficiency for 4.94 ± 0.52 for concentrate fed and 3.91± 0.59 for swill fed group.

Body weight

Analysis of variance showed significant effect of diets from start of the experiment (2nd month of age) to end (7th month of age). The pigs fed with 50 per swill feed replaced group (T_2) attained more weight (59.01 ± 1.32 kg) when compared to other groups and lowest recorded in T_3 group (49.69 ± 5.44 kg). Similarly the same trend was observed in the final weight at 7th month of age in T_2 (72.83 ± 4.08 kg) than the 50 % concentrate fed group T3 (63.66 ± 1.08 kg). This finding was supported by Sinha (1989) who also observed faster growth in pigs maintained on kitchen waste as compared to concentrate fed group. Harikumar (2001) who has also recorded a higher slaughter weights for Large White Yorkshire pigs maintained on chicken offal and restaurant waste than those on concentrate feed. The higher growth rate in pigs maintained completely on kitchen waste played a significant role in meeting the requirement of growing animals (Raju *et al*., 2004).

Average daily gain

The average daily gain was statistically different between the treatment groups, it was higher in 50 per cent swill fed pigs T_2 (393.0 ± 58.28 g) followed by the fourth group T_4 fed with 50 % swill, 25 % concentrate and 25 % Hedge Lucerne T_4 (378.5 ± 25.71 g) and 100 per cent concentrate fed group T1 (344.66 ± 11.91 g). Harikumar (2001) recorded average daily gain of 318.98 ± 11.09 g and Rohila *et al.(*2000) recorded 335.45 ± 17.4 g for Large White Yorkshire pigs which was lower than the values obtained in concentrate fed pigs in the present study.

Carcass characteristics

Carcass weight:

The carcass weight was significantly (P<0.01) higher in 50 per cent swill fed group T2 (52.50 ± 1.75 kg) than the 100 per cent concentrate fed group T1 (48.33 ± 0.08 kg). This might be due to the fact that swill feed having higher fat and carbohydrate content, resulting in greater adipose tissue deposition. This result might also be due to variation in final weight between treatment groups leading to difference in carcass weight. This was in accordance with Bhadoria (1996). On the contrary Jha *et al*. (1999) and Chinnamani *et al*.(2008) reported that concentrate fed group has high carcass weight than garbage fed group. But chances are more for the former concept than the latter.

Dressing percentage:

There was no significant difference in the dressing percentage in between the treatment groups. Although it was higher in T_2 (71.32 ± 4.42) and lowest in T_1 (69.79 ± 0.97). This might be due to more fat deposition in garbage fed group than concentrate fed group. Similarly Chinnamani *et al.(*2008)) reported that there was no significant difference of dressing percentage in concentrate fed group (65.01± 0.78) and 50 per cent swill fed group (65.01± 0.83) and highly significant difference was observed in 100 per cent swill fed group (71.04 ± 1.05). This was supported by Ramesh *et al*. (2010) who reported that there was no significant difference in the dressing percentage among 100 per cent concentrate fed group with 50 per cent replaced with swill fed

group.On the contrary Jha *et al*.(1999) observed that the concentrate fed group had high dressing percentage than garbage fed groups

Carcass length

The carcass length was numerically higher in T_4 (74.50± 2.25 cm) than T_1 (72.53±1.08 cm). The higher carcass length observed in T_2 might be due to intake of more carbohydrates in the form of cooked rice. Carbohydrates generally utilized when energy is spent by working or by movement. In pigs the chances of utilizing carbohydrates is less, which in turn converted and deposited as fat. This finding was in agreement with Sinha (1989) and Chinnamani *et al.* (2008) who also observed significantly (P<0.01) more carcass length of 75 per cent swill fed group (63.50± 0.50 cm) than the 100 per cent concentrate fed group (57.50± 0.42 cm). On the contrary Jha *et al.* (1999) observed that concentrate fed group had high carcass length than garbage fed group.

Back fat thickness:

The 50 per cent swill fed group T2 had significantly (P<0.01) high back fat thickness (25.33 ± 1.08 mm) compared to 100 per cent concentrate fed group T1 (20.83 ± 1.58 mm). This might be due to conversion of excess energy into fat deposition. Similar observation was made by Chinnamani *et al.* (2008) who stated that 100 per cent swill fed group had significantly (P<0.01) high BFT (29.16± 0.66 mm) compared to 75 per cent swill group (27.50 ± 0.33 mm), 50 per cent swill fed group (25.50 ± 0.60mm) and 100 per cent concentrate fed group (18.66 ± 0.61 mm). On the contrary Jha *et al.* (1999) reported that concentrate fed group had high back fat thickness than the garbage fed group.

Loin eye area

The loin eye area (sq.cm) was higher in 50 per cent swill fed group T2 (24.16 ± 0.58) compared to 100 per cent concentrate fed group T1 (21.83 ± 1.08). Large variations in body weight at the time of slaughter as well as difference in dietary protein level in the diet are the causes. Higher LEA was recorded in T_2 group clearly indicated progressive increasing proportion of hostel waste in pig ration. A similar trend of improvement in loin eye area was also reported by Sinha (1989) in pigs maintained on hotel waste as compared to conventional diets. Chinnamani *et al.(*2008) stated that loin eye area (sq.cm) was higher in 100 per cent swill fed group (22.40 ± 0.47) than the 100 per cent concentrate fed group (21.20 ± 0.47). On the contrary Jha *et al.* (1999) observed that concentrate fed group had high loin eye area than the garbage fed group. It was concluded that100 per cent concentrate was replaced on DM basis with hostel food waste at 50 per cent level and followed by 50 % swill, 25 % concentrate and 25 % Hedge Lucerne can be adopted without affecting the growth rate and carcass traits. This would help to reduce the cost of production per kg of meat.

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