Influence of Kitchen/food waste on growth performance of grower piglets

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Abstract

Crossbred (Landrace x Desi) pigs (24) were randomly distributed into 2 dietary treatments (T_1 and T_2 diets) each having 12 pigs of 6 castrated male and 6 females. The pigs were fed on *ad libitum* control diet in T_1 and *ad libitum* FW in T_2 collected from student's hostel and air force mess. During the feeding trial, the CP and EE %of food wastes was found to be higher in food waste (FW) than standard ration (SR). However, CF was less in FW. The DMI (g/d) was significantly lower in pigs fed on food waste based diets. However, ADG was significantly ($P<0.05$) higher in T_2, which in turn increasing feed conversion efficiency of pigs in T_2. Feed cost per kg live weight gain was also lower ($P<0.05$) in T_2 compared to T_1. Thus, it can be concluded that nutritive value of food waste based diets was much higher than the concentrate mixture based diets. Piglets grew more in FW based diets and could be utilized as an alternate economic feed for pigs without any negative effects.

Keywords: Food waste, Growth, Pigs, Ration, Nutrient.

Introduction

Feeding of pig accounts for 70% of total recurring cost. Therefore, there is ample scope for getting more benefit by incorporating low cost feed in the ration of pigs. Feeding grain based ration gives better daily growth rate, but net return is less due to ever-increasing price of grains in India. Food/kitchen wastes are nutrient rich surplus materials, which have higher CP and energy value (Westendorf and Myer, 2004) and can be used as regular feeds for pigs (Moon *et al.*2004). These can be collected from households, hotel, hostel, restaurants and other sources at minimal price, and fed pigs as such or after boiling. These nutrient dense surplus bio wastes can be fed to animals in their early growing stage for better growth rate. This favourable early growth may have positive effect on overall production, reproduction and carcass quality in latter stages.

Therefore, the present study was conducted to find out the influence of food/ kitchen waste on growth performance in growing piglets under tropical climate.

Materials and Methods

Twenty four crossbred (Landrace x desi) grower piglets just after weaning (approx. 13 kg body weight) were randomly divided into 2 groups comprising of 12 animals in each group. Each group had 4 replicates of 3 animals. Feeds were offered in the morning and residues were collected and weighed in the following morning. The body weight of animals was recorded at the beginning of the experiment and subsequently at weekly interval till the piglets attained body weight of 30 kg. The pigs in control group (T1) were fed Standard ration (SR) *ad libitum* consisting of crushed maize, deoiled soyabean meal, wheat bran, fish meal, mineral mixture and common salt at the rate of 35, 10, 47, 6, 1.5 and 0.5 percent, respectively. Feed additives were added at the rate of 2 kg/tonne of feed mixture. In second group (T2) pigs were fed on Food waste (FW) *ad libitum.* The selected animals were housed in concrete pens provided with separate feeder, water trough and a run behind. Weekly record of weight gain and daily feed intake were taken. Samples of feeds and residues were analysed for proximate principles as per methods described by AOAC (1995). Gross energy (GE) of feeds and residues were estimated by Gallenkamp Ballistic Bomb Calorimeter (CBB 330). The data obtained from the experiment were analyzed as per the standard methods of statistical analysis (Snedecor and Cochran, 1995). Feed cost per kg of

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Table-1. Chemical composition, Nutritive value and Production performance of pigs.

Parameters	FW	SR
Crude protein (%)	19.08	18.48
Ether extract(%)	11.03	4.44
Crude Fibre(%)	4.41	6.73
Nitrogen free extract(%)	59.54	66.12
Total carbohydrate(%)	63.87	73.75
Gross energy (kcal/g)	4.63	4.52
CP	**T_1**	**T_2**
g/day	209.23 ^{a} ± 4.04	160.70 ^{b} ± 6.06
g/kg (0.75/d)	20.67 ^{a} ± 0.32	16.08 ^{b} ± 0.86
TDN		
g/a/day	820.06 ^{b} ± 5.84	717.15 ^{a} ± 27.04
g/kg W0.75/d	81.02 ^{a} ± 1.25^{a}	71.77 ^{b} ± 3.82
GE		
Kcal/a/day	5116^{a} ± 98.8	3551 ^{b} ± 133.89
Kcal/kg W0.75/d	505 ^{a} ± 7.80 ^{a}	355 ^{b} ± 18.92
Production performance		
Initial body weight(kg)	13.29 ± 1.01	13.20 ± 1.26
Final body weight(kg)	30.53 ± 0.58	30.00 ± 0.14
Average daily gain (g)	334 ^{b} ± 10.00	389 ^{a} ± 14.0
AV. Daily DMI (kg)		
1.Standard ration	-	1.13 ± 0.02
2.Kitchen waste	-	0.75 ± 0.06
Total	1.13 ^{a} ± 0.02	0.75 ^{b} ± 0.06
Feed(DM): gain	3.41 ^{a} ± 0.16	1.93 ^{b} ± 0.20
CP : gain	0.80 ^{a} ±0.03	054 ^{b} ± 0.01^{b}
DMI (% Body Wt.)	5.17 ^{b} ± 0.10	3.41 ^{a} ± 0.20
DMI (g/kg 0.75/d)	113.50 ^{a} ± 1.99	75.74 ± 4.27
Feed cost (Rs/kg Body Wt. gain)	25.56 ^{a} ± 1.20	3.85 ± 0.19

Means bearing different superscripts (a,b) in a row differ significantly

Prices of Crushed maize, Deoiled soyabean meal, Wheat bran, Fish meal, Mineral mixture, Common salt and Vitablend at local market were Rs. 574.00, 1387.00, 492.00, 1150.00, 1042.00, 96.00 and 680.00 per quintal respectively. Price of kitchen and Vegetable wastes were Rs. 0.50 and 0.40/kg (approximately).

BWT gain was calculated based on local prices of feed ingredients fixed at the time when experiment was conducted.

Results and Discussion

The chemical composition of pooled FW and SR is presented in Table 1. Average CP and EE content of FW were more than that of SR (19.08 and 11.03 vs 18.48 and 4.44 %). CP% was comparable with the standard of NRC. However, CF was markedly less in FW (4.41%) compared to SR (6.73%). Energy value (kcal/g of feed) was also more in FW than SR (4.63 vs 4.52). Though kitchen waste are very rich in nutrient contents, these are very much variable within and/or between sources from place to place due to different food habits of peoples (Westendorf and Dong.1997, Lipstein, 1984). CP, TDN and GE Intake were significantly (P<0.05) higher in T1 compared to T2. This might be higher DM intake in control group.

Average daily gain was significantly (P<0.05) higher in T2 (389 g/day) compared to T1 (334 g/day) in which FW was offered *ad libitum.* The higher daily gain in T2 might be due to higher digestibility of FW and favourable rations containing absorbed nutrients, which was reflected in higher growth in T2. Moreover, the energy loss due to heat production might be less

in T2 because of relatively lower CF percent in the FW (4.4 compared to 6.73% in T1) coupled with favourable energy protein ratio. However, average daily dry matter intake was 1.13 kg/day in T1 compared to 0.75 kg/day in T2. The feed: gain was significantly ($P<0.05$) lower T2 (1.93) compared to T1(3.41).Digestibility of FW in T2 might be more compared to T1, so the animals in the T2 took less DM per unit of gain and resulted in lower feed: gain. Moreover, proportional availability of amino acids, energy, different trace elements and vitamins might be favourable to the synthesis of body protein, fat and bones.Feed cost per kg. of live weight gain of pigs was significantly ($P<0.05$) lower in T2 (Rs.3.85) compared to T1 (Rs. 25.56). The reduction of overall feed cost was also reported by various workers in their studies (Ravi *and* Reddy*.* 1997 and Arnal *et al.* 1996. Therefore, it can be concluded that food waste could be utilized as an alternative feed in the ration of grower pigs because of its higher nutrient composition and favourable effect on average daily gain. Economic return is more due to reduction in cost of kitchen waste. It may be an effective feeding regime in urban and/or peri-urban areas because of its abundance and easy collection.

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