

Short Communication

Performance of growing pigs and finisher broilers housed together

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Abstract

Growth performance and cost of feeding young growing pigs and finisher broilers under integrated broiler/pig production system were investigated. Four young growing pigs (the control) were housed in pen A and fed 4% of their body weight as commercial growers feed. Another 4 were housed in pen B with broilers in cages placed above them and given 2% of their body weight as commercial growers feed and allowed to make up with droppings from the broilers above. Another 4 were housed without broilers in pen C and given 2% of their body weight as commercial growers feed and droppings collected from broilers housed without pigs in pen D. Each pig within a treatment was tagged and regarded as a replicate. The broilers were put in the cages at week 5 and given broiler finisher feed ad libitum. They were removed at 9 weeks of age and replaced with another batch similarly raised, a process that was repeated 3 times in the 12-week trial. The growth rate of the pigs of the control group was statistically similar to that of the group housed with broilers ($P>0.05$) but significantly ($P<0.05$) higher than that of the group housed without broilers. There were no significant differences ($P>0.05$) in the feed intake, growth rate and feed conversion ratio of the broilers housed with pigs and those housed without pigs. Cost analysis of the production systems showed that N104.00 was spent on feed to produce 1.0kg liveweight of pigs in the control group and N65.00 for the other two groups.

Keywords: Pigs, broilers, integrated production

Introduction

In Nigeria, fresh pork and poultry meat have a ready market. Unfortunately, feed cost is constituting over 90% of poultry and pig farm recurrent expenditure (Igboeli, 2000). There is the need to develop sustainable low-cost intensive management strategies for pigs and poultry in the country. Re-cycling of poultry waste seems to be one such management strategy since it has been reported that poultry waste has good nutritive value and can be consumed by cattle, sheep, pigs and even poultry without deleterious effects (El Sabben *et al*, 1970; Fontenot *et al*, 1971); Nitis *et al*, 1980;

Udedibie and Omekam, 2001). This study was designed to determine the growth performance and cost of feeding young growing pigs and finisher broilers housed together.

Materials and Methods

Four separate pig pens, 4m x 3m and 1.2m high, were numbered A,B,C and D. A locally fabricated cage, partitioned into 6 compartments, was supported on the walls at the extreme back of pens B and D such that poultry and feed wastes from the birds in them could drop on the floor. Each cage, measuring 4.2m long and 0.4m high, was made to contain up to

30 broiler birds at finisher phase (i.e. 5 birds per compartment).

One hundred day-old Anak broiler chicks were raised in a deep litter floor according to standard practice until 5 weeks. Twelve young growing pigs (6 males and 6 females) of large white breed, weighing 13-14kg on the average were divided into 3 groups of 4 pigs, equalised for body weights. The first group (the control) was kept in pen A. They were fed 4% of their body weight as commercial growers feed. The second

group was housed in pen B with a cage for the birds placed above them as described above. They were fed 2% of their body weight as commercial growers feed and had access to feed and poultry droppings from the birds above. The third group was housed in pen C and fed 2% of their body weight as commercial growers feed and offered feed and poultry droppings collected from birds housed in pen D. Pen D consisted of broilers in cages and no pigs. Ingredient composition of the pig growers feed is shown in Table 1.

Table 1: *Ingredient Composition of the Commercial Pig Growers Feed*

| Ingredients | % of Dry Matter |
|-------------------------|-----------------|
| Maize | 25.00 |
| Maize offal | 20.00 |
| Dried brewers' grains | 20.00 |
| Palm kernel cake | 10.00 |
| Soybean meal | 20.00 |
| Local fish meal | 2.00 |
| Bone meal | 2.50 |
| Common salt | 0.25 |
| Vitamin/Mineral premix* | 0.25 |

*To provide the following per kg feed: Vit. A, 10,000 iu; Vit. D, 2000 iu; Vit. B₁, 0.75g; Vit. B₂, 5g; Nicotinic acid, 25g; Calcium pantothenate, 125g; Vit. B₁₂, 0.15g; Vit. K₃, 2.5g; vit. E, 25g; Biotin, 0.05g; Folic acid, 1g; Choline chloride, 250g; Cobalt, 0.4g; Copper, 8g; Mg, 64g; Fe, 32g; Zn, 40g; Iodine, 0.8g; Flavomycin, 100g; Spiromycin, 5g; DL-Methionine, 50g; L-Lysine, 120g; Selenium, 0.16g.

At five weeks of age, 60 broiler chicks were selected from the flock and transferred into the cages, 30 birds per cage and 5 birds per compartment. The birds in each compartment were treated as a replicate (i.e. 6 replicates/treatment). The day that the birds were transferred to the cages was taken as the day the trial started. Both the birds and the pigs were weighed that day to obtain their initial body weights and weekly thereafter. The weekly weights of the pigs were used to adjust the quantity of the growers feed to be fed. While the pigs in pen B fed on the broiler and feed droppings as they dropped, the broiler and feed droppings from pen D were collected every

morning and given to the pigs in pen C after they had eaten the commercial growers feed. The left-over of broiler and feed droppings were cleaned up every morning. Samples of the growers feed and the droppings of feed and faeces from the birds were analysed for proximate composition according to AOAC (1990). Each pig within a group was taken to be a replicate (i.e. 4 replicates/treatment). The broilers were removed at 9 weeks of age and sold. As soon as they were removed, another batch of 5-week old ones similarly raised were brought in to replace them. This was repeated 3 times and the trial lasted 12 weeks.

Broiler/pig integrated production

The birds and the pigs were weighed weekly for determination of body weight gains. Feed offered and the left-overs were weighed daily to determine feed intake. Cost of feeding of the pigs was based on feed intake of the growers feed and the related weight gain. At the end of the trial, the pigs were slaughtered for determination of their dressed weights and weights of their internal organs, including backfat thickness. Data collected on body weight change and growth rate of the pigs as well as feed intake, growth rate and feed conversion ratio of the birds were statistically analysed using analysis of variance as outlined by Snedecor and Cochran (1978). Where the analysis of variance indicated significant

treatment effects, means were compared using least significant difference (LSD) as outlined by Snedecor and Cochran (1978).

Results and Discussion

The proximate composition of the experimental pig growers feed and faecal/feed droppings from the broilers is shown in Table 2. The growers ration met the recommended nutrient requirement of pigs of the size and age used in the trial (NRC, 1973; Payne, 1990). The proximate composition of the faecal/feed droppings from the broilers was also similar to the values earlier reported (Fontenot *et al*, 1971; Nitis *et al*, 1986; Udedibie and Omekam, 2001).

Table 2: Proximate composition of the experimental pig growers ration and faecal/feed droppings from finisher broilers

| Proximate Components* | Pig Growers Ration | Faecal and Feed Droppings |
|-------------------------|--------------------|---------------------------|
| Dry Matter, % | 91.85 | 93.75 |
| Crude protein, % of DM | 20.44 | 21.17 |
| Ether Extract, " | 9.85 | 2.75 |
| Crude fibre, " | 2.84 | 9.85 |
| Total Ash, " | 13.50 | 15.90 |
| Nitrogen free extract,, | 45.22 | 44.17 |

* All values expressed on dry matter basis.

Data on the performance of the experimental pigs are shown in Table 3. The growth rate of the control group was statistically similar to that of the group housed with broilers ($P > 0.05$) but significantly ($P < 0.05$) higher than that of the group housed without broilers. There was no statistical difference ($P > 0.05$) between the

growth rate of those housed with broilers and that of the group housed without broilers. This finding tended to agree with earlier observation by Nitis *et al* (1986) that integration of poultry and pig production is most efficient and effective when poultry and feed wastes fall directly to the pig feed trough.

Table 3: Performance of grower pigs under integrated broiler/pig production system

| Parameters | Treatments* | | | SEM |
|------------------------------------|--------------------|---------------------|--------------------|------|
| | TRT-A | TRT-B | TRT-C | |
| Av. initial body wt. (kg) | 14.00 | 13.80 | 13.80 | 0.07 |
| Av. final body wt. (kg) | 58.70 ^a | 46.00 ^{ab} | 44.37 ^a | 4.53 |
| Av. daily wt. Gain (kg) | 0.46 ^a | 0.33 ^{ab} | 0.31 ^b | 0.05 |
| Av. daily growers feed intake (kg) | 1.44 | 0.65 | 0.61 | - |
| Kg growers feed/kg gain | 3.13 | 1.97 | 1.96 | - |
| Mortality | 0.00 | 0.00 | 0.00 | - |
| Internal Organs | | | | |
| Dressed wt. (kg) | 38.65 ^a | 30.40 ^{ab} | 27.70 ^b | 3.30 |
| Dressing percentage (%) | 61.50 ^a | 59.00 ^{ab} | 58.30 ^b | 1.07 |
| Heart (% of dressed wt.) | 0.98 ^a | 0.75 ^{ab} | 0.54 ^b | 0.13 |
| Lungs | 1.81 ^a | 1.64 ^{ab} | 1.26 ^b | 0.16 |
| Liver | 3.96 ^a | 3.95 ^a | 3.25 ^a | 0.24 |
| Kidneys | 0.78 ^a | 0.72 ^a | 0.72 ^a | 0.02 |
| Spleen | 0.39 ^{ab} | 0.43 ^a | 0.36 ^b | 0.01 |
| Back-fat thickness (cm) | 1.10 ^a | 0.90 ^b | 1.00 ^a | 0.03 |
| Economics of Production** | | | | |
| Cost of growers feed (N/kg) | 33.22 | 33.22 | 33.22 | - |
| Kg growers feed/kg gain | 3.13 | 1.97 | 1.96 | - |
| Cost of production (N/kg gain) | 103.98 | 65.44 | 65.11 | - |
| Savings (N/kg gain) | - | 38.54 | 38.87 | - |

ab means within a row with different superscripts are significantly different ($P < 0.05$).

* TRT-A= Control; TRT-B = Pigs housed with broilers; TRT-C= Pigs housed without broilers

** Cost of feed was calculated based on the prevailing cost of ingredients at the time.

It was difficult to determine the exact total feed intake of the two groups that were fed poultry and feed droppings. However, since the quantity of the growers feed offered was dependent on percent of body weight, the pigs of the control group were calculated to have higher intake of the growers feed since they grew relatively faster.

Feed/gain ratio was 3.13, 1.97 and 1.96 for treatments A, B and C, respectively. Based on this, feed cost/kg gain was N104, N65 and N65 for treatments A, B and C, respectively. Since the poultry and feed wastes which those pigs consumed attracted zero cost, it followed that for each kg of live-weight produced from those

two groups, there was a saving of about N39.00 on feed costs.

The weights and integrity of the livers and kidneys, the major organs of metabolism, were not affected by treatments ($P > 0.05$).

Data on the growth performance of the first, second and third batches of broilers used in the study are summarised in Table 4. There were no significant differences ($P > 0.05$) between treatments B and D in terms of final body weights, growth rate, feed intake and feed conversion ratio. Housing pigs and broilers in one pen did not interfere with feed intake and growth of broilers in this study.

Broiler/pig integrated production

Table 4: Performance of the experimental broilers

| Parameter ^a | First Batch | | | Second Batch | | | Third Batch | | |
|---|-------------|---------|-------|--------------|---------|-------|-------------|---------|-------|
| | TRT-B* | TRT-D** | SEM | TRT-B* | TRT-D** | SEM | TRT-B* | TRT-D** | SEM |
| Av. initial body wt. (kg) | 1.04 | 1.04 | - | 0.84 | 0.92 | 0.04 | 0.98 | 1.00 | 0.001 |
| Av. final body wt. (kg) | 2.58 | 2.70 | 0.06 | 2.45 | 2.50 | 0.03 | 2.51 | 2.71 | 0.01 |
| Av. daily feed intake (kg) | 0.22 | 0.23 | 0.005 | 0.23 | 0.24 | 0.005 | 0.22 | 0.23 | 0.005 |
| Av. growth rate (kg/day) | 0.05 | 0.06 | 0.001 | 0.06 | 0.06 | - | 0.05 | 0.06 | 0.001 |
| Feed conversion ratio (kg feed/kg gain) | 4.40 | 3.80 | 0.03 | 3.83 | 4.00 | 0.04 | 4.40 | 3.83 | 0.03 |
| Mortality | 0.00 | 0.00 | - | 0.00 | 0.00 | - | 0.00 | 0.00 | - |

*Birds housed with pigs; ** Birds housed without pigs.

^a Comparison of parameters indicated no treatment effects ($P > 0.05$) between birds housed with pigs and those housed without pigs.

Conclusion

The results of this trial have demonstrated that broilers and pigs can be housed together to reduce cost of feeding pigs. The results have also shown that of the two combinations evaluated, the more efficient and less laborious is to house pigs and broilers together so that wastes from the broilers can directly be picked up by the pigs.

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