PERFORMANCE OF GROWING MALE PIGS EXPOSED TO QUANTITATIVE FEED RESTRICTION

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ABSTRACT

Eighteen growing pigs weighing 32.4 ± 1.4 were assigned in a completely randomized design to three levels of dietary rearmaments to know the effect of quantitative fed restriction on them. Each treatment had three replicates of two growing pigs per replicate. Each of the treatment was fed one of the 3 dietary levels as follows: 10% of the body weight as feed given to the control group (T1), 7.5% for T2 and 5.5% for T3. Analysis of variance at the end revealed that though the total feed intake value for T1 differed slightly numerically than those of T2 and T3, there were no significant differences (P> 0.05) in feed gain and body weight gain in all the treatments. Economic analysis was also determined. Result shows that subjecting growing pigs to feed restriction made higher profit than the control.

KEY WORDS: Quantitative, feed restriction, Pig.

INTRODUCTION

The ideal practice of feeding pigs at 10% body weight has sometimes not been attained due to high cost of feed, lack of skilled manpower, and government policies on the importation of raw materials/ingredients. Anthony (1991) reported that feed cost account for about 70% of total cost of production in the tropics. This has apparently resulted in high cost of pig products. Feed restriction in animal production can reduce the cost of production by 30%. Quantitative and qualitative feed Restriction for Monogastrics have been studied by Bows et al, (1988) who reported on the nature and levels of feed restriction that will not result in considerable weight loss and poor production. Food restriction and compensatory growth are an important phenomenon in temperate condition with food shortage in inter and re-alimentation in wt and dry seasons (Lee et al, 1971; Hogg, 1991). Conversely, in and semi-and areas food shortage occurs in dry season associated with thermal stress.

Feed restriction had been used on pigs as a means of reducing their excessive fat deposit and feed cost (Arafer et al, of 1983). There is a close relationship between level of feeding and the weight of some non-carcass components particularly the metabolic organs (Atti, et al, 2002; Times et al, 1981). So, when intake changes, weights of visceral organs occur, which produce changes in the maintenance requirement (Ferrel et al, 1986). It has been shown that animals on restricted planes off nutrition have proportionally smaller livers (Ferrel et al, 1986; Marray et al, 1977) and also have lower maintenance energy requirement (MER). It has been suggested that the phenomenon of compensatory gain is directly related to liver mass and protein turn-over (Frisch and Vercoe, 1977). However, the requirements of splanchnic tissues, particularly the gut, represent a major part of MER (Hogg, 1991) and this adaptation to under feeding, by a reduction of the MER, has been explained by a decrease in the weight of the gut and some other metabolic organs in underfed animals (Mdllisson et al, 1991).

This experiment is therefore justified by the fact that exposing the pigs to quantitative feed restriction, will reduce the cost of production without a significant difference in the productivity of the animal.

MATERIALS AND METHODS

Experimental site
This experiment was carried out at the piggery research unit of the department of animal production and fisheries management, Ebonyi State University, Abakaliki

Economic analysis
The following parameters were measured.

Body weight gain = initial body weight – final body weight
Daily weight gain = body weight gain
Number of experimental days.

Statistical analysis
Data on feed intake, body weight gain, final body weight and feed efficiency were analyzed using a one-way ANOVA (Analysis of Variance) in a Completely Randomized Design (CRD) and significant means were separate using Duncan’s multiple Range Test.

Data Collection
Fed intake: The daily feed requirement were measured and served to each treatment between 7:00am and 8:00am daily. Left over were weighed and recorded the next morning. The difference between the fed served and the over was assumed to have been consumed. The daily body weight gain was determined mathematically by dividing the body weight gained by the number of days/weeks the study lasted.

The feed conversion ratio was determined by dividing the average daily intake by the average daily weight gain. That is:

Body weight gain = initial body weight – final body weight

Daily weight gain = body weight gain
Number of experimental days.
RESULT AND DISCUSSION

The summary of the effects of the treatment on the performance of the pigs is shown on Table 2 means of final body weight showed that there was no significant difference (P> 0.05) in body wt between pigs in the control (T1) group and those in T2 and T3. Result agrees with the earlier finding of Beane et al. (1979) in chicken, which showed that restricting the feed intakes of broilers to 85% of full fed control again, is in line with that reported by (Bohman 1955. Plavnile and Hurtwiz 1985; and Tion et al, 2001) also in chicken, that was non significance difference (P< 0.05) in the growth of earlier restricted group of chicken following realimentation.

Table 1: The Composition of the experimental Diet

| INGREDIENTS                      | PERCENTAGE INCLUSION (5) |
|----------------------------------|--------------------------|
| Maize by-product                 | 50                       |
| Barbara nut by-product (Okpa)    | 20                       |
| Palm Kennel Cake (P.K.C)         | 29                       |
| Bone Meal                        | 0.4                      |
| Salt                             | 0.25                     |
| Premix*                          | 0.25                     |
| Lysine                           | 0.10                     |
| **TOTAL**                        | **100**                  |

* Vitamin A 10,000 I.U, Vitamin D3 2,000,000 I.U, Vitamin E 12,000 I.U, Vitamin K 2 I.U, Thiamine B1 1.5 GR., Riboflavin B2 5 GR, Pyriboflavin-B6 5 GR, Vitamin B12 10 MGR, Biotin 20 Niacin 15 GR, Pantothenic acid 5 GK, Folic acid 0.6 GR, manganese 75 GR, Zinc 50 GR, Iron 25 GR, Copper 5 GR, Iodine 1 GR, Selenium 100 MGR, Cobalt 300 MGR, B.T. 125 Gr, Choline Chloride 150 GR.

The slightly numerical difference in final body wt of T1 (45.42kg), T2 (44.15kg) and T3 (43.18kg) where (T1 = 1.27kg > T2 = 0.97kg > (T 3) affirms the suggestion of Cock (1963) and Mollison et al (1984) that although the compensatory growth of the restricted animal at certain periods may equal that of the unrestricted group, the final body wt of the restricted groups never up with that of the unrestricted (control group), some of the reasons for the discrepancy have been discussed by Murray et al. and (1977) and this includes the severity, the duration and the timing of the feed restricted. In this study, the pigs were fed at three dietary levels of their body weights at growing age. Hogg (1991) gave same indication that cattle restricted before 6 months of age showed limited compensatory growth subsequently almost independent of the severity of the restriction, while cattle restricted at ages beyond 6 months exhibit compensatory growth proportional to the degree of restriction. Thus, there might have possible been a residual effect of the initial 10% body weight feeding regime (from waning to growing age) during the restriction period which did not allow the effect of the restriction to be made manifest. That is, since restriction did not start from weaning, tissue development at this phase could not have been impeded.

Feed intake and feed conversion ratio

Table 2 also reveals that the total fed intake value for T1 differed slightly numerically, than those of T2 and T3. FCR (Feed gain ratio) did not differ (P> 0.05) in all the treatments. Increased appetite resulting in an increased feed intake is generally thought to be the most important factor considered to have a possible influence on compensatory live weight gains and feed efficiency. (McCartney and Brown, 1976). Though there were numerically significances (P> 0.05) in the total feed intake among the treatments. The feed efficiency did not differ (P< 0.05) among the treatments. This is supported by the report of Orr and Kirk (2001) that the level of intake may influence the rate of passage and/or digestibility and thus the efficiency of fed conversion. It is possible that the feed consumed by the full-fed animals as too much in the stomach within a given time to have limited rate of passage and/or digestion, whereas the reverse is the case in the restricted animal.
### Table 2: Performance of Pigs Place on Quantitative Feed restriction

| Parameters                     | Treatments | Level of significant |
|-------------------------------|------------|----------------------|
| Initial body wt (kg)          | 34.10      | 33.50                | 33.16 | N.S |
| Final body weight (kg/pig)    | 45.42      | 44.15                | 43.18 | N.S |
| Total weight gain (kg)        | 12.91      | 12.86                | 12.17 | N.S |
| Average daily weight gain kg/day | 0.61    | 0.59                 | 0.58  | N.S |
| Total feed intake kg          | 85.17      | 66.61                | 66.45 | N.S |
| Average daily feed intake kg  | 2.66       | 2.57                 | 2.49  | N.S |
| F.C.R.                        | 4.36       | 4.35                 | 4.29  | N.S |

- **NS = not significant (P > 0.05)**

Further confirmatory support for the findings of this study is that feed restriction often results in apparent decrease in maintenance requirement due to depressed metabolic rate, suggesting that an animal becomes more and more efficient in utilizing a reduced food intake (Frisch and Vercoe 1977). This is based on the concept of a reduced maintenance requirement.

Table 3 gives effect of fed restriction on the economy of production. The data revealed that feed cost (N)/kg weight gain increased in this order: T₃, T₂ and T₁.

### Table 3: Economic Analysis

| PARAMETER                                                                 | TREATMENT |
|---------------------------------------------------------------------------|-----------|
| Cost of feed/kg (N)                                                      | 20        |
| Total feed consumed (kg)                                                 | 85.17     |
| Labour + exigencies                                                      | 400       |
| Total cost of feed consumed (N)                                          | 1,703.40  |
| Cost of production of pigs (N) (cost of feed consumed + labour and exigencies) | 2,103.40  |
| Total weight                                                              | 45.42     |
| Selling Price/kg weight (N)                                              | 350       |
| Total selling price = Revenue (N)                                        | 15,897.00 |
| Net returns                                                              | 13,793.60 |
| Cost/Benefit ratio                                                       | 1.52      |

The net returns (gain N/pig) were found to be as follows: T₁ = N1379360, T₂ = N13723.50, T₃ = N13580.80

Higher fed cost/kg feed consumed was observed in T₁ and the weight Naira/pig was higher in T₃ by N7.02. Thus, the increase in cost/kg gain in T₁ was a reflection of higher quantity of feed consumed and the increased weight in Naira/pig in T₃ was also as a result of efficient feed conversion.

This result agrees with the findings of Bohman (1955) and Ferrel et al (1986) that feed restriction had a significant effect on monetary returns for birds over fed. Lee et al. (1971) also indicated that birds subjected to feed restriction made higher profit than the control. From the present study pigs fed 7.5%, and 5.5% of their body weight compared favourably to that fed the recommended 10% body weight.

The cost of production of the pigs also, followed similar trend.

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### CONCLUSION

In conclusion, feeding growing pigs at almost half (5.5%) of the body weight than the recommended feeding standard (10%) body weight will have no significant effect on the growth and performance of the pigs and will reduce the cost of production by almost 30%. Thus, feeding at 10% body weight may amount to more wastage considering the cost of feed and poverty level in this part of the world.

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