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Performance of Weaner Rabbits Fed Growers Mash Supplemented with Graded Levels of Hatchery Waste Meal

[1]L.J. Isaac, [1]A.C. Okonkwo, [2]G.D. Eyoh, [1]A.E. Ekpenyong and [1]O.R. Akata
[1]Department of Animal Science, University of Uyo, Nigeria
[2]Akwa Ibom State College of Agriculture, Obio Aqua, Oruk Anam, Akwa Ibom State, Nigreia

Abstract: Twenty rabbits were used in a 12 week feeding trial to assess their performance when fed Hatchery Waste Meal (HWM) included in Growers Mash (GM) at 0, 15, 25 and 45% levels. They were randomly assigned to 5 treatments replicated four times each. Growers mash was used as the control diet (0%) and the inclusion levels were determined on the basis of 100 g that was given to the control group. Fifty gram of Centrosema pubescence was also given across treatments. Result showed a significant ($p<0.05$) difference among treatment with respect to feed intake, while weight changes and feed conversion ratio showed no significant ($p>0.05$) differences among treatments. On the whole, it seems reasonable to postulate that HWM holds a great potential and as such could be used, as a feed ingredient in rabbit production, since it is capable of supporting production.

Key words: Weaner rabbits, growers mash, hatchery waste meal, graded level, inclusion

INTRODUCTION

The rabbit is fast becoming a popular farm animal for its meat which has been reported by Ibeawuchi and Fajuyitan (1986) and Aduku and Olukosi (1990) to be outstanding both for its dietary effect and chemical composition. It incorporates more protein in its body than other meat animals. The meat when compared to beef, pork and chicken is superior because of its very low fat, cholesterol and sodium content thereby making it a good source of animal protein for coronary heart patients.

Rabbit production in Nigeria is affected by high cost and unavailability of conventional supplements. Thus to reduce the production cost, it is imperative to look for other cheaper protein feed resources. Processed hatchery waste-which according in Hamm and Whitehead (1982), consist of all the collectible materials remaining in commercial hatching trays after salable chicks have been removed-is a good source of energy, protein and has considerable amount of fat (Reddy, 1988) and Calcium with low phosphorus (Dufloth *et al*., 1987). Shingari *et al*. (1995) reported Crude protein content of 35.49% crude fibre 6.35%, Ash 25.40% and Calcium 0.60%. The meal normally includes shells from hatched chicks, infertile eggs, dead embryos still in shell and dead chicks processed either by dehydration, cooking with water, toasting and autoclaving, rendering fermentation or irradiation.

Hatchery waste has successfully been fed to broiler and layer birds. There are few studies on the use of hatchery waste as a protein supplement in the diets of rabbits. This work was therefore carried out to explore the potential of Hatchery Waste Meal (HWM) in rabbit production.

METERIALS AND METHODS

Twenty weaner rabbits were used for the experiment. Four weaner rabbits were randomly allocated to each treatment, in a completely randomized design.

Raw hatchery waste, which comprised of candled unfertile eggs, dead chicks in shell and shells of the hatched eggs, was collected from the hatchery after the removal of the hatch. It was cooked in water for 45 min dried and milled to form a meal. The Hatchery Waste Meal (HWM) was then added to commercial growers mush at 0% inclusion level (T_1 control), 15% (T_2), 25% (T_3) 35% (T_4) and 45% (T_5). Each rabbit was given 100 g of feed which formed the basis on which the inclusion levels were determined, along with 50 g of centrosoma pubescence to allow for the proper working of the gasto-intestinal tract.

Data on feed intake, body weight gain and feed gain ratio were collected and subjected to analysis of variance, while the Duncan's multiple range test (Steel and Torrie, 1980) was used to separate means where significant differences were noticed.

Corresponding Author: L.J. Isaac, Department of Animal Science, University of Uyo, Nigeria

RESULTS AND DISCUSSION

The chemical composition of Hatchery Waste Meal (HWM) is shown in Table 1. The crude protein content depends primarily on the composition of the waste. The protein content of the meal prepared in this study was 33.50% which is similar to the one prepared by Isaac *et al.* (2006) and is very close to that reported by Shingari *et al.* (1995). However, the meals prepared by Ilian and Salman (1986) and Ristic and Kormanjos (1988) contained much lower contents of protein (about 22.50%) due to the presence of high shell proportions in the waste. While the meal prepared by Isaac *et al.* (2005) had a higher crude protein content (44.50%).

The result of the study is presented in Table 2. It showed a mean feed intake value of 600g, (T_1 602 g, (T_2), 584 g (T_3), 560 g, (T_4) and 543 g, (T_5). The highest feed intake was observed in treatment 2 (15% inclusion level). Statistical analysis showed that T_1 T_2 and T_3 did not differ significantly ($p>0.05$) from each other. In the same vein there was no significant ($p>0.05$) difference between T_4 and T_5. However, T_1 T_2 and T_3 (on the one hand) differed significantly ($p<0.05$) from T_4 and T_5 (on the other hand). It was also observed that beyond the 15% inclusion level, intake was depressed. This difference can be attributed to the varying levels of inclusion of hatchery waste meal in the feed which tended to alter the nutrient balance of the feed. Such imbalances have the tendency of causing a deficiency of dietary nutrients which according to Moody (1991) has an effect on intake. The fact that the fibrous nature of hatchery waste meal may have the tendency of increasing the bulk particle of the feed such that its high inclusion level beyond that considered tolerable tends to impact negatively on intake may not be totally ruled out.

The mean weight gain values 98 g (T_1), 83 g (T_2), 80 g (T_3), 78 g (T_4) and 76 g (T_5) did not differ significantly ($p>0.05$) among treatments. It was noticed that increased inclusion level tended to impact negatively on weight gain. This could be attributed to the reduced feed intake as well as to the fact the there could be some unknown growth factors in the meal which is in line with Wiseman (1964), that the presence of unknown growth factors affects the growth of animals.

Feed gain ratio were, 7.30% (T_1), 8.40% (T_2), 8.40% (T_3), 10.60% (T_{4+}) 10.60% (T_4) and 8.80% (T_5). It showed no significant differences ($p>0.05$) among treatments. However, it is higher than the range of 2.50-3.50% reported by Oyawole (1989) for weaner rabbits in the tropics.

The use of waste materials as unconventional feed stuffs which Hitherto had been left unused was primarily targeted at reducing the cost of production of food animals such that with reduced feed cost and the attendant increase in production there will be resultant increased revenue to the farmer. That Hatchery Waste Meal (HWM) inclusion in growers mash did not affect weight gain significantly and in spite of the high feed conversion ratios, portrays the fact that it can be used in rabbit production as a means of reducing the cost of production which according to many workers is a major problem of animal production in the tropics with developing economics where there exist a large number of resource poor farmers.

The result of this work has made it imperative that the last may not have been heard with respect to the potential of this material, for it has the tendency to support production (Isaac *et al*., 2005) and apart from reducing the cost of production which in turn will enhance the revenue that accrues to the farmer and as such leads to an improvement in the farmers living condition, also according to Isaac *et al.* (2002) has the tendency to bring about a cleaner, Safer and better environment as there will be a proper and an efficient way of disposing of waste materials that would have constituted pollutants to the environment. According to Shih (1993), large qualities of waste is produced thus posing a difficult disposal problem and is becoming as source of pollution. Moreso, these wastes may contain pathogenic micro-organisms which can pose a health hazard both to animals and humans. Due to the fact that these materials could constitute environmental pollutants, it is imperative that an efficient process to treat the wastes and convert them to useful and safe resources be developed. More so it is important that the optimum inclusion level be determined

Table 1: Chemical composition of the hatchery waste meal

Description (%)	HWM
Dry matter	91.62
Crude protein	33.48
Ether extract	10.42
Crude fibre	6.37
Ash	23.40
Nitrogen free extract	20.31
Calcium	0.60

Table 2: Summary performance of weaner rabbits fed experimental diets

Parameter	Diet 1 (0%HWM)	Diet II (15% HWM)	Diet III (25%HWM)	Diet IV (35% HWM)	Diet V (45% HWM)
Feed intake (g)	600.0±20.00^a	602.0±30.00^a	584.0±33.00^a	560.0±44.00^b	543.0+44.00^b
Feed conversion ratio (g)	7.3±3.9	8.4±3.50	8.4±3.6	10.6±8.50	8.8±4.20
Weight gain (g)	98.0±36.80	83.0±32.00	80.0±29.40	78.0±38.97	76.0±22.90

a, b, c, means in the same row having different superscript are significantly ($p<0.05$) different from each other

if this must indeed support production performance as this according to Isaac *et al.* (2006) is responsible for the poor performance noticed in other works with rabbits.

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