# PERFORMANCE OF GROWING WEANER RABBITS FED GRADED LEVELS OF SHEEP MANURE BASED DIETS

**G.S. BAWA, M.R. HASSAN S.B. ABDU AND B.I. TAHIR**
Department of Animal Science, Ahmadu Bello University, Zaria; sbabdu@abu.edu.ng +2348060398664

## ABSTRACT
A study was carried out to determine the effects of inclusion levels of Sheep Manure on growth performance of growing weaner rabbits. Five isonitrogenous dietary treatments composing of 0, 10, 20, 30, and 40% graded levels of sheep manure were formulated for the study. The experiment was a completely randomized design which lasted for 63 days. Results showed that rabbits fed 20% sheep manure based diet had significantly ($P<0.05$) higher feed intake, while the least (61.18g/day) was observed in rabbits fed 40% sheep manure based diet. Final weight gain was statistically ($P<0.05$) higher in rabbits fed the control diet (1436.30g) and the least was recorded in rabbits fed the 40% diet (1005.50g). Significant ($P<0.05$) difference in body weight gain was observed across dietary treatments. Rabbits fed 10% and 20% sheep manure, had significantly ($P<0.05$) higher and similar average daily weight gain (15.74 and 14.50g/d, respectively), compared to those on 30% and 40% sheep manure based diets (10.47 and 8.14g/d, respectively). From the results obtained it can be concluded that Sheep manure can be incorporated up to 20% in the diet of growing rabbits without any adverse effect on their performance.

## INTRODUCTION
Rabbit (*Oryctolagus cuniculus*) is becoming a popular farm animal that should receive attention because of its genetic flexibility, variability, adaptability, and productivity in a wide range of system (Lebas *et al.*, 1986). The unprecedented increase in the cost of conventional ingredients used in compounding livestock feeds has necessitated investigation into the use of agricultural and agro-based industrial byproducts, which are regarded as nonconventional feed resources (Oluokun and Olaloku, 1999). One example of such unconventional feed ingredients that is relatively high in protein and energy levels and can form a satisfactory feed ingredient when incorporated in livestock diet is sheep manure (Abeke *et al.*, 2003; Onu, 2007; Onu and Otuma, 2008). Recycling of animal wastes has always existed in nature between the same or among diverse species. Rabbits, rats, poultry and pigs are the most typical examples because in 'specific nutritional situations' they consume their own excreta in substantial quantities to meet their nutritional requirements. In recent years, the use of animal manure for the feeding of livestock has generated considerable interest due to the fact that the conventional feedstuffs can no longer adequately meet the need of the fast growing livestock industries (Abeke *et al.*, 2003). Heat-treated Sheep dropping has been reported by Abeke *et al.*(2003) to contain 86.95% dry matter, 16.88% crude protein, 24.42 crude fibre, 2.95% ether extract, 26.31% ash, 1.3% calcium, 0.5% phosphorus and 1088 kcal/kg metabolizable energy. Despite the high nutrient content of sheep manure, there is paucity of information on its use in rabbit feeding, hence necessitates its use in the present study. Therefore, this study was aimed at determining the inclusion level of Sheep Manure on performance of growing rabbits.

## MATERIALS AND METHODS
The experiment was conducted at the Rabbitry Unit of the Animal Science Departmental Teaching and Research Farm, Ahmadu Bello University, Samaru, Zaria lying between Latitude 11° 33'N, 07° 37'E and at an Altitude of 686m above sea level. The area falls within the Northern-Guinea Savannah Zone with an average annual rainfall of 1100mm, which last from late April and early May to Mid-October (Wikipedia, 2014). The sheep manure used in this experiment was obtained from the sheep Unit of Animal Science Departmental Teaching and Research Farm, Ahmadu Bello University, Zaria. Unwanted materials like feed remains, straws and stones were handpicked before shade drying the sheep manure. Five isonitrogenous diets (Table 1) were formulated to contain 0, 10, 20, 30 and 40 % inclusion levels of sheep manure. Other ingredients in the diet include, Maize offals, GNC, SBM, Wheat Offal, Bone Meal, Lime stone and premix. Each inclusion level serves as treatment.

**Experimental Animals and Management**

Twenty five (25) rabbits of mixed breeds and sex of equal live weight were used in this experiment. They were housed in individual wire cages and were prophylactically treated against internal and external parasites by subcutaneous injection of Ivomectin® (0.2ml/rabbit), and a broad-spectrum antibiotics (Oxytetracycline L.A) before the commencement of the feeding trial. The experiment lasted for nine (9) weeks. Feed intake, weight gain, feed conversion ratio, percent mortality were determined weekly.

**Laboratory and Statistical Analysis**

The dry matter content of sheep manure and experimental diets were determined by using Kjeldahl nitrogen analyses (AOAC, 2000) method. All the data obtained were subjected to statistical analysis using analysis of variance (ANOVA) procedure of SAS (2001). The significant treatment means were compared using the Duncan Multiple Range test option of the same software.

## RESULTS AND DISCUSSION

**Composition of sheep manure**

The result of proximate composition of sheep manure used and the experimental diets are presented in Table 2. The 15.92% crude protein content of the sheep manure recorded in this study was lower than 16.88% reported by Abeke *et al.* (2003). This difference in the composition could be attributed to feeding and management of the sheep from which the manure was obtained and also the handling and processing of the manure. The nutrient composition of the experimental diets are within the levels recommended for growing rabbits (Aduku, 1993)

**Performance of growing rabbits fed graded levels of sheep manure**

The growth performance of the experimental rabbits is presented in Table 3. There was significant ($P<0.05$) difference in body weight gain across dietary treatments. Rabbits fed 10% and 20% sheep manure, had significantly ($P<0.05$) higher body weight compared to those on 30% and 40% sheep manure based diets respectively. The control diet (0% sheep manure), was significantly ($P<0.05$) better than those on other dietary treatment. This result is in agreement with the report of Yusuff *et al.* (2008) who fed graded level of sheep and goat dung to broilers and those of Abeke *et al.* (2003) and Onu and Otuma (2008) who fed heat treated sheep manure to layers and broilers, respectively.

There was statistical ($P<0.05$) difference among treatment groups in terms of feed intake. Rabbits fed 20% sheep manure based diets had significantly ($P<0.05$) higher feed intake, while the least (61.18g/day) was observed on rabbits fed 40% sheep manure based diets. Although rabbits can utilize fibre to some extent, but An (1994) reported that when energy level drops below body requirement, animals tends to mobilize energy reserves for maintenance rather than productivity which could lead to a decrease in weight gain as observed on rabbits fed 40% sheep manure. The poor performance of animals fed 40% sheep manure based diet can be attributed to increase in fiber and lower energy, which is known to reduce feed intake. The significant difference ($P<0.05$) observed in feed intake with increase in level of sheep manure in this study may be attributed to differences in metabolizable energy, protein and an increase in fibre content of the experimental diets. This contradicts reports of Abeke *et al.* (2003) and Onu *et al.* (2006). However, it is in agreement with that of Shakouri *et al.* (2006) that high fibre decreases feed intake as a result of increase in feed retention time in the gastro intestinal tract which is reflected in Table 2.

## CONCLUSION

From the results obtained, it can be concluded that Sheep manure can be incorporated up to 20% in the diet of growing rabbits without any adverse effect on their performance. Further studies should be conducted by inclusion of exogenous enzyme in the diet to find out weather rabbit can tolerate high level of sheep manure

## REFERENCES

Abeke, F.O., Ogundipe, S.O., Sekoni, A.A., Adeyinka, I.A., Abubakar, B.Y., Oni, O.O. and Nwagu, B.I. (2003). Response of Laying Hens to Dietary Levels of Heat Treated Sheep Manure (HSM). *Tropical Journal of Animal Science*, 6: 111-116.

Aduku, A.O. (1993). Tropical Feedstuffs Analysis Table Department of animal Science Faculty of Agriculture Ahmadu Bello University, Zaria.

An, W., (1994). Effects of Different Sources of Fibre on Performance of tibia Mineral Content in Broilers Poultry Abstract, 20: 377.

AOAC. (2000): Association of Official Analytical Chemists. W. Horwitz (Editor)

official methods of analysis, 13th, Washington, D.C.

Lebas, F., Coudert, P., Rouvier, R. and Rochambeau, H.D. (1986). *The Rabbit Husbandry Health and Production.*

Oluokun, J.A. and Olaloku, E.A. (1999). Effects of graded levels of brewers' spent grains and kolanut pod meal on the performance characteristics and carcass quality of rabbits. *Nigeria Journal of Animal Production.* 26:71-77.

Onu, P.N. (2006). Performance Response of Starter Broilers fed Ronozyme in Soyabean Hulls. Based Diets. *J. Sci. Eng. Tech.*, 13: 6664-6674.

Onu, P.N. and Otuma, M.O. (2008). Utilization of heat – treated sheep chopping in the diets of broiler finisher chicks. *Inter. J. Poult. Sci.* 7 (2): 169 – 173.

Shakouri, M.D., Kermanshahi H., and Mohsenzadeh, M. (2006). Effect of different non starch polysaccharides in semi purified diets on performance and intestinal microflora of young broiler chickens. *International Journal of Poultry Science,* 5: 557-561

Yusuff, A.T., Suleiman, A.O. and Yunusa M.M. (2008). Recyling of sheep and goat dung as a feed substitute in broiler feeding. *International Journal of Food and Agricultural Research,* 5:17-22

Table1: Gross composition of experimental diets

| Ingredients | Dietary Inclusion levels of sheep manure (%) | | | | |
|---|---|---|---|---|---|
| | 0 | 10 | 20 | 30 | 40 |
| Maize offals | 54.99 | 47.15 | 39.32 | 31.48 | 23.63 |
| GNC | 26.11 | 23.95 | 21.78 | 19.62 | 17.47 |
| SBM | □ | 5 | 5 | 5 | 5 |
| Sheep Manure | 0 | 10 | 20 | 30 | 40 |
| Wheat Offal | 10 | 10 | 10 | 10 | 10 |
| Bone Meal | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Lime stone | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Salt | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| Lysine | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Methionine | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| Premix* | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| **Total** | **100** | **100** | **100** | **100** | **100** |

*premix provided per kg of diets: vitamin A – 13.340 i.u., vitamin D3 – 3,260 i.u., vitamin E – 105 mg, vitamin K3 – 3 mg, vitamin B1 – 3 mg, vitamin B2 – 5 mg, vitamin B6 – 4 mg, vitamin B12 – 0.04 mg, niacin amide – 40 mg, Ca pantothenate – 12 mg, biotin – 0.15 mg, folic acid – 1.5 mg, choline-Cl – 250 mg, ethoxyquin – 100 mg, Mn – 80 mg, Cu- 3.3mg Zn – 60 mg, Fe – 50 mg, I – 1 mg, Se – 0.25 mg. $T_1$ (0% sheep manure), $T_2$ (10% sheep manure), $T_3$ (20% sheep manure), $T_4$ (30% sheep manure) $T_5$ (40% sheep manure)

Table 2: Proximate composition of experimental diets

| Parameters | Dietary Inclusion levels of sheep manure (%) | | | | | Sheep Manure |
|---|---|---|---|---|---|---|
| | 0 | 10 | 20 | 30 | 40 | |
| Dry matter | 94.99 | 87.15 | 89.32 | 91.48 | 93.63 | 93.15 |
| Crude protein | 16.11 | 16.95 | 16.78 | 16.62 | 16.47 | 15.92 |
| Crude fiber | 5.45 | 6.12 | 6.78 | 7.23 | 8.44 | 26.09 |
| Ether extract | 3.56 | 3.12 | 3.22 | 3.27 | 3.32 | 3.08 |
| Ash | 3.78 | 3.67 | 3.66 | 3.87 | 3.78 | 3.72 |
| NFE | 53.56 | 54.33 | 54.65 | 54.59 | 54.61 | 51.19 |

NFE=Nitrogen free extract

Table 3: Performance of weaner rabbits fed graded levels of sheep manure

| Parameter | Dietary Inclusion levels of sheep manure (%) | | | | | SEM |
|---|---|---|---|---|---|---|
| | 0 | 10 | 20 | 30 | 40 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Initial weight (g) | 555.00 | 556.00 | 554.00 | 553.00 | 554.00 | 17.7 |
| Final weight (g) | 1436.30$^{a}$ | 1313.30$^{ab}$ | 139.50$^{ab}$ | 1139.50$^{bc}$ | 1005.50$^{c}$ | 31.78* |
| ADFI (g) | 65.93$^{bc}$ | 74.63$^{a}$ | 74.78$^{a}$ | 71.21$^{ab}$ | 61.18$^{c}$ | 1.18* |
| ADWG (g) | 15.74$^{a}$ | 13.52$^{ab}$ | 14.50$^{a}$ | 10.47$^{bc}$ | 8.14$^{c}$ | 0.48* |
| FCR | □□₸9$^{c}$ | 5.52$^{b}$ | 5.16$^{b}$ | 6.80$^{a}$ | 7.52$^{a}$ | 1.02* |
| Feed Cost/kg gain | 125.61 | 120.19 | 123.37 | 118.60 | 108.53 | 29.81 |

$^{a,b,c}$ means within the same row differed significantly (P<0.05), SEM = Standard error of means, ADWG = Average daily weight gain, ADFI = Average daily feed intake, FCR= Feed Conversion Ratio