

## Performance of Weaned Rabbits Raised in Cages or Pens in Northern Guinea Savannah Zone of Nigeria

BM Shehu<sup>1)\*</sup> and MM Mahmoud<sup>2)</sup>

<sup>1)</sup>National Agricultural Extension and Research Liaison Services, Ahmadu Bello University, Zaria, Kaduna State

<sup>2)</sup>Animal Science Department, Ahmadu Bello University, Zaria, Kaduna State

\*Corresponding author email: [balashehu2000@yahoo.com](mailto:balashehu2000@yahoo.com); Telp: +2348050878016

**Abstract.** Management system in rabbit production has been reported to affect the performance of rabbits. In view of this, an eight week study was conducted to evaluate the effects of two different management systems (cage-housed and pen-housed) on the growth performance indices of weaned rabbits in Northern Guinea Savannah zone of Nigeria. Twenty four (24) weaned rabbits of heterogeneous breeds in equal sexes, aged between 5-6 weeks, with live weight of  $612 \pm 14.72$  g were used for the study. The rabbits were randomly divided into two groups (cage-housed and pen-housed) consisting of 12 rabbits per group. They were fed commercial diet (concentrate) supplemented with Tridax procumbens and given access to clean fresh water ad libitum. The experiment lasted for 8 weeks. Results from the study showed a significant difference ( $P < 0.05$ ) in daily body weight gain, feed intake and final body weight. Caged-housed Rabbits recorded higher daily weight gain, daily feed intake  $72.24 \pm 0.07$  g/day and final body weight of  $1373 \pm 41.57$  g as against  $9.92 \pm 0.38$  g/day,  $63.58 \pm 0.88$  g/day and  $1168 \pm 23.36$  g, respectively for the pen-housed rabbits. It is concluded that rabbits raised in cages had better growth performance indices than those raised in pens. It is however, recommended that further studies be conducted to assess the welfare of rabbits raised under the two management systems.

**Key words:** Growth performance, weaned rabbits, management systems.

**Abstrak.** Sistem pemeliharaan ternak kelinci mempengaruhi performan kelinci. Penelitian telah dilakukan selama 8 minggu untuk mengevaluasi pengaruh dua sistem pemeliharaan yang berbeda terhadap index pertumbuhan kelinci lepas sapih di area Northern Guinea Savannah, Nigeria. Dua puluh empat (24) kelinci lepas sapih dengan jenis kelamin sama, umur 5-6 minggu dengan bobot hidup  $612 \pm 14,72$  g digunakan dalam penelitian ini. Kelinci dibagi secara acak ke dalam dua kelompok (kandang terkurung dan pen), setiap kelompok 12 kelinci. Kelinci diberi pakan konsentrat disuplementasi dengan Tridax procumbens dan air diberikan secara ad libitum. Eksperimen berlangsung selama 8 minggu. Hasil penelitian menunjukkan perbedaan nyata pada kenaikan bobot harian, asupan pakan dan bobot akhir. Kelinci yang dikandang terkurung memiliki pertambahan bobot badan harian  $13,62 \pm 0,70$  g/hari, asupan pakan harian  $72,24 \pm 0,07$  g/hari, dan bobot badan akhir  $1373 \pm 41,57$  g yang lebih tinggi daripada kelinci dalam kandang pen, secara berturut-turut yaitu  $9,92 \pm 0,38$  g/hari,  $63,58 \pm 0,88$  g/hari dan  $1168 \pm 23,36$  g. Disimpulkan bahwa kelinci yang dipelihara dalam kandang terkurung memiliki indeks pertumbuhan yang lebih baik daripada yang di dalam pen. Penelitian lebih lanjut disarankan guna mengukur kenyamanan kelinci yang dipelihara dengan dua sistem pemeliharaan tersebut.

**Kata kunci:** Performan pertumbuhan, kelinci lepas sapih, sistem pemeliharaan

---

### Introduction

Rabbit meat production has been on the increase in Nigeria in recent years. Rabbits (*Oryctolagus cuniculus*) are considered a fast growing and highly prolific species with a short generation interval (Cheeke, 1987). Rabbits in Nigeria are largely been raised in cages and mainly iron frame cages. According to Van Der

Horst et al. (1999) and Maertens and Van Oeckel (2001), the housing system affects body weight, some carcass parameters and sometimes the meat quality. The aim of the present study was to evaluate the growth performance indices of caged-housed and pen-housed weaned rabbits raised in the Northern Guinea Savannah zone of Nigeria.

## Materials and Methods

The experiment was conducted at the rabbitry unit of the Skills Acquisition Centre of the National Agricultural Extension and Research Liaison Services, Ahmadu Bello University, Zaria (11°12' N, 07°33' E), located in the Northern Guinea Savannah zone of Nigeria. Twenty four (24) weaned rabbits of heterogeneous breeds in equal sexes, aged between 5-6 weeks, with live weight of 612±14.72 g (mean±SD) were procured from local rabbit producers in Zaria. The rabbits were randomly divided into two groups (cage-housed and pen-housed) consisting of 12 rabbits each. The cage-housed were kept housed in a well-ventilated rabbitry in three tier-wire cages. Each cage, measured 70 x 60 x 50 cm in length, width and height, respectively. The wire cages were fitted with earthen drinkers and feeders, and aluminium tray for collection of faeces and urine. The second group was housed in pen according to housing standards for rabbits (0.4 sq meter/rabbits (Hoy, 2005). Wood shaving was used as the litter material and the depth of the litter was about 3 inch. The rabbits were pre-conditioned for two weeks, during which they were treated twice against parasitic infestation with Ivermectin (Laboratorios Calier, Barcelona, Spain) at the dose rate of 0.1ml per rabbit subcutaneously. Rabbits were fed commercial diet supplemented with Tridax procumbens and given access to clean fresh water ad libitum. Rabbits were weighed individually using a sensitive analytical balance (Saratorius, Germany) at the beginning of the experiment and thereafter, weekly for the duration of the experiment. Weighing was done before morning feeding at 8:00 h. To evaluate the growth performance of the rabbits, initial weight (g), daily weight gain (g), daily feed intake (g) and final body weight (g) were measured. Weight gain for each rabbit was calculated by subtracting the initial weight (g) from the final body weight (g). The study lasted

for 8 weeks. The composition of the commercial diet fed to the rabbits is presented in Table 1.

Table 1. Composition of commercial diet fed to rabbits

Ingredients	Percent
Maize	25
Soybean meal	5
Maize offal	15
Brewer's dried grain	25
Blood meal	2
Groundnut cake	12
Rice offal	12
Bone meal	3
Salt	0.25
Premix <sup>a</sup>	0.25
Lysine	0.25
Methionine	0.25
Total	100

<sup>a</sup>Provided per kilogram of diet: vitamin A; 10 000 IU (retinyl acetate); cholecalciferol, 3000 IU; vitamin E, 8.0 IU (DL- $\alpha$ -tocopheryl acetate); K, 2.0 mg; thiamine, 2.0 mg; pyridoxine, 1.2 mg; cyanocobalamin, 0.12 mg; niacin, 1.0 mg; pantothenic acid, 7.0 mg; folic acid, 0.6 mg; choline chloride, 500 mg; Fe, 60 mg; Mn, 100 mg; Cu, 8.0 mg; Zn, 50 mg; Co, 0.45 mg; I, 2.0 mg; Se, 0.1 mg.

**Statistical Analysis.** The data obtained were subjected to t-test in a completely randomized design using SAS 9.1 software package (SAS Institute, 2004), with the type of management system as the main source of variation. The means were compared using Duncan's New Multiple Range Test (Duncan, 1955). Values of  $P < 0.05$  were considered significant.

## Results and Discussion

The growth performance indices of the weaned rabbits raised under the two different management systems are presented in Table 2. Results showed a significant difference ( $P < 0.05$ ) in daily body weight gain, feed intake and final body weight. Caged-housed Rabbits recorded higher daily weight gain (13.62±0.70 g/day), daily feed intake (72.24±0.07 g/day) and final body weight of 1373±41.57 g as against 9.92±0.38 g/day,

Table 2. Growth performance indices of weaned rabbit raised under two different management systems

Indices	Pen-housed	Cage-housed	Probability
Initial body weight (g)	612.34±3.40	609.81±6.01	0.72
Daily body weight gain (g/day)	9.92 <sup>b</sup> ±0.38	13.62 <sup>a</sup> ±0.70	<0.0001
Daily feed intake (g/ day) <sup>1</sup>	63.58 <sup>b</sup> ±0.88	72.24 <sup>a</sup> ±0.70	<0.0001
Final body weight (g)	1168 <sup>b</sup> ±23.36	1373 <sup>a</sup> ±41.57	<0.0001

Values bearing different superscripts at the same rows differ significantly (P<0.05)

<sup>1</sup>: Feed intake for commercial diet (concentrate)

63.58±0.88 g/day and 1168±23.36 g, respectively for the pen-housed rabbits. The performance indices of the caged-housed rabbits were superior to the pen-housed rabbits. This finding agrees with the reports of Metzger et al. (2003), who observed that the final body weight of pen-housed rabbits was 4.9% lower (P<0.05) than the caged-housed rabbits. Similar reports were made by Maertens and Van Oeckel (2001). The consumption of litter material could be responsible for the lower daily body weight gain of the pen-housed rabbits as reported by Morisse et al. (1999) and Van Der Horst (1999). Maertens and Van Herck (2000) also attributed the lower final body weight of pen-housed rabbits to high locomotor activity. The lower daily feed intake recorded for pen-housed rabbits are as results of feed wastage associated with group rearing.

## Conclusion

The Rabbits raised in cages had better growth performance indices than those raised in pens. It is however, recommended that further studies be conducted to assess the welfare of rabbits raised under the two management systems.

## References

Cheeke PR. 1987. Rabbit Feeding and Nutrition. Academic Press, Orlando. 376 pages.

- Duncan DB. 1955. New multiple range and multiple F-test. *Biometrics*. II:1-42.
- Hoy S. 2005. Housing requirements for breeding rabbits from the viewpoint of welfare, behaviour and hygiene. In: Proceeding 4<sup>th</sup> International Conference on Rabbit Production in Hot Climates. Sharm El-Sheikh. Pebruary, 2005. Pp: 9-13.
- Maertens L and A Van Herck . 2000. Performance of weaned rabbits raised in pens or in classical cages: first results. *World Rabbit Sci.* 8(1):435-440.
- Maertens L and MJ Van Oeckel. 2001. Effet du logement en cage ou en parc et de son enrichissement sur les performances et la couleur de la viande des lapins. In: Proceeding 9<sup>ème</sup> Journées Recherche Cunicole. Paris, November 2001. Pp:31-34 (in French with abstract in English)
- Metzger S, K Kustos, Z Szendro, A Szabo, C Eiben and I Nagy. 2003. *Agriculturae Conspectus Scientificus* 68(3):151-154.
- Morisse JP, E Boilletot and A Martenchar. 1999. Grillage ou litière: choix par le lapin etc incidence sur le bien-être. In: Proceeding 8<sup>ème</sup> Journées Recherche Cunicole. Paris, June 1999. Pp:63-66 (in French with abstract in English).
- SAS, 2004. SAS user's guide, statistics. SAS Institute INC, Cary, NC.
- Van Der Horst F, N Jehl and PF Koel. 1999. Influence du mode d'élevage (cage ou parc) sur les performances de croissance et les qualités bouchères des lapins de race Normande. In: Proceeding 8<sup>ème</sup> Journées Recherche Cunicole. Paris, June 1999. Pp:71-74 (in French with abstract in English).