

EFFECT OF SEX ON BODY LINEAR MEASUREMENTS OF RABBITS FED SWEET POTATO (*Ipomoea batatas*) LEAVES

Usman, M.T.^{1*}, Gambo, D.¹, Musa, I.S.¹ and Mallam, I.²

¹Department of Animal Science, Faculty of Agriculture, Nasarawa State University, Keffi, Shabu-Lafia Campus, P.M.B. 135, Lafia, Nasarawa State, Nigeria.

²Department of Animal Science, Kaduna State University, Kafanchan Campus, Kaduna State, Nigeria.

*Corresponding author: maimunattijjani@gmail.com, +2348035926157

ABSTRACT

The study was conducted to determine the effect of sex on body linear measurements of rabbits fed sweet potato vines. A total of fifty-four weaner rabbits (7 weeks old) made up of three breeds comprising twenty-seven males and twenty-seven females each that were procured from the National Veterinary Research Institute (NVRI), Vom, Jos, Plateau State, Nigeria were used for the experiment. These comprised 18 each (9 males and 9 females) of New Zealand, Dutch and Chinchilla breeds, and were assigned using Completely Randomized Design. The rabbits were managed using standard procedure. Data collected were Body and neck length, body length, body width, heart girth, leg length, neck length, tail length and ear length. Data collected were analyzed using SPSS statistical package version 21. Results obtained indicated that sex had no significant ($P>0.05$) effect on all the parameters at weeks 1, 3 and 6 except for heart girth, leg length and neck length where male rabbits had significantly ($p<0.05$) higher values. From the results obtained, it can be concluded that both male and female rabbits can be raised on sweet potatoes without any negative effects on their linear body measurements.

Keywords: Effect, Sex, Linear measurements, Rabbits, Sweet potato

INTRODUCTION

The provision of feed for livestock continues to be a significant limitation in commercial production, attributed to the rising costs of traditional feed components resulting from competition between humans and animals for available resources (Zeferino *et al.*, 2013). Rabbit is becoming recognized as a significant source of animal protein due to its effective use of forages (Marai *et al.*, 2002). Rabbits are proficient in converting feed into meat and may utilize up to 30% crude fiber, enhancing intestinal motility, compared to 10% in most poultry species (Zeferino *et al.*, 2013). Feeding sweet potato leaves has been shown to improve growth performance in rabbits. The incorporation of these leaves into their diet not only enhances nutrient digestibility but also promotes better reproductive outcomes. Studies have demonstrated that diets containing 50% sweet potato leaves lead to improved weight gain and overall health in rabbits compared to those on a 100% concentrate diet (Otchoumou *et al.*, 2019). Research indicates that sex plays a significant role in the body linear measurements of rabbits. Male rabbits generally exhibit higher body weights and linear measurements compared to females (Kiprono *et al.*, 2018). Kiprono *et al.* (2018) also reported that male rabbits often have a greater chest circumference, body length, and ear length, which are critical indicators of growth performance and health status. Therefore, the objective of the study was to determine the effect of sex on body linear measurements of rabbits fed sweet potato vines.

MATERIALS AND METHODS

The study area

The research was conducted at the Teaching and Research Farm, Department of Animal Science, Faculty of Agriculture Shabu-Lafia Campus, Nasarawa State University, Keffi. The study area is located in the Guinea Savanna zone of North Central Nigeria, and found on latitude 08° 33' N and longitude 08° 32' E.

Management and experimental design of the experimental animals

The total of fifty-four (54) weaner rabbits made up of three breeds comprising twenty-seven (27) males and (27) females each were procured from National Veterinary Research Institute (NVRI), Vom, Jos, Plateau State, Nigeria and used for the experiment. This comprised 18 each (9 males and 9 males) for each breed. The rabbits were housed in well cleaned and disinfected hutches with dimensions of 70 x 60 x 50cm each. The males and the females were housed separately and quarantined for two weeks.

During this period, the rabbits were dewormed with Endovef® (Ivermectin) at the dose of 0.3 mg/kg subcutaneously and also treated prophylactically against coccidiosis with Amprole 200® according to the manufacturer's prescription. After quarantining, the rabbits were randomly assigned to three treatments (T1=100 % concentrate, T2= 50% concentrate, T3= 100 % sweet potato vines) in a completely randomized design (CRD). Six (3 bucks and does each) rabbits were assigned to each treatment replicated three times such that each replicate had 2 (1 buck and 1 doe) rabbits. The rabbits were given water *ad-libitum*. The rabbits were raised under clean and hygienic environment. All the rabbits were medicated appropriately.

Source of sweet potato vines

Sweet potato vines (SPV) used in this study were obtained from a farm located within Lafia. The SPV were harvested fresh daily and fed to the rabbits at the predefined ratio with the commercial pelletized concentrate feed (PCF).

Data collection

Body linear measurements

A tailor's tape was used in measuring the body linear measurements. The body parts measured were; ear length (EL), Neck length (NL), leg length (LL), body and Neck length (BNL), Body length (BL), heart girth (HG), tail length (TL). The measurements were taken according to methods described by Teguia *et al.* (2008) as given below:

Body and neck length: - Measuring tape was used to measure the distance from the base of the ear to the base of the tail.

Hearth girth: - A circumferential measurement was taken round the chest region behind the front legs.

Body width: - Measurement was taken when rabbit was held in a resting position from the front leg to the hind leg.

Neck length: Measurement was taken from the base of the head to the shoulder.

Leg length: Measurement was taken from the base of the tail to the feet.

Ear length: Measurement was taken from the tip of the ear to the base of the ear.

Body length: Measurement was taken from the base of the shoulder to the base of the tail.

Tail length: Measurement was taken from the base of the tail to the end of the tail.

Statistical Analysis

All data collected on body linear measurements were subjected to Analysis of Variance (ANOVA) to test the fixed effect of sex using SPSS package (version 21). Significant means were separated using Duncan's Multiple Range Test (Duncan, 1995). All statements of significance were based on the 0.05 level of probability. The below linear model was employed:

$$Y_{ij} = \mu + S_i + e_{ij}$$

Y = individual mean observation

μ = general mean of the population

S_i = sex effect

e_{ij} = error

RESULTS AND DISCUSSION

Table 1 revealed the effect of sex on body linear measurements of rabbits fed sweet potato (*Ipomoea batatas*) leaves. Sex had no significant effects on body linear body measurement at all weeks studied except on heart girth in week 1, leg length in week 3 and in neck length. Male rabbits (buck) had significantly ($P<0.05$) higher heart girth in week 1, leg length in week 3 and in neck length compared to the females.

The results obtained in this present study is similar with the report of Kiprono *et al.* (2018) who reported that male rabbits often have a greater chest circumference, body length, and ear length, which are critical indicators of growth performance and health status. Mallam *et al.* (2018) observed a significant ($P<0.05$) difference in body weight and linear body measurements among three breeds (Chinchilla, New Zealand White and Dutch) of rabbits of both male and female.

CONCLUSION

Sex had effect on body linear measurements of rabbits used in the study with male rabbits having better heart girth, leg length and neck length at weeks 1, 3 and 6 weeks, respectively and male rabbits fed sweet potato vine are therefore recommended for better body linear in the study area.

Table 1: Effects of sex on body linear measurements of rabbits fed sweet potato (*Ipomoea batatas*) leaves

Parameter	Male	Female	P -value
At Week 1 of the experiment			
Body & neck length (cm)	29.76±0.41	29.07±0.41	0.101 ^{NS}
Body length (cm)	25.20±0.32	24.37±0.35	0.408 ^{NS}
Body width (cm)	21.12±2.60	24.19±2.60	0.145 ^{NS}
Heart girth (cm)	20.03±0.44 ^a	19.10±0.44 ^b	0.016 [*]
Leg length (cm)	20.48±0.51	18.69±0.51	0.880 ^{NS}
Neck length (cm)	4.61±0.17	4.65±0.17	0.988 ^{NS}
Tail length (cm)	7.86±0.18	7.86±0.17	0.194 ^{NS}
Ear length (cm)	11.85±0.25	11.39±0.25	0.246 ^{NS}
At Week 3 of the experiment			
Body & Neck Length (cm)	31.69±0.51	30.37±0.51	0.074 ^{NS}
Body length (cm)	26.32±0.48	25.11±0.48	0.081 ^{NS}
Body width (cm)	21.57±0.52	20.87±0.32	0.344 ^{NS}
Heart girth (cm)	21.20±0.61	20.50±0.61	0.418 ^{NS}
Leg length (cm)	22.07±0.44 ^a	20.82±0.44 ^b	0.049 [*]
Neck length (cm)	5.54±0.023	5.39±0.23	0.648 ^{NS}
Tail length (cm)	7.63±0.31	8.25±0.31	0.173 ^{NS}
Ear length (cm)	11.43±0.21	11.15±0.21	0.355 ^{NS}
At Week 6 of the experiment			
Body & Neck Length (cm)	30.70±0.61	30.57±0.61	0.881 ^{NS}
Body length (cm)	25.11±0.54	25.48±0.54	0.628 ^{NS}
Body width (cm)	20.50±0.53	20.48±0.52	0.980 ^{NS}
Heart girth (cm)	20.67±0.68	20.52±0.68	0.877 ^{NS}
Leg length (cm)	26.72±1.79	24.43±1.79	0.367 ^{NS}
Neck length (cm)	5.56±0.20 ^a	4.94±0.20 ^b	0.036 [*]
Tail length (cm)	8.17±0.31	8.37±0.31	0.646 ^{NS}
Ear length (cm)	11.11±0.19	11.48±0.19	0.182 ^{NS}

^{ab} =mean with different super scripts are significantly different at 5% probability. NS = Not significant, * = significant at 5% probability

REFERENCES

- Duncan, D.B. (1955). Multiple ranges and multiple F-test. *Biometrics*, 11:1-42.
- Kiprono, M.F., Wekesa, K.R., George, M.E., Muturi, M.J. and Awuor, A.S. (2018). Assessment of relationship between body weight and biometric traits using path analysis in Kenyan domesticated rabbits. *Journal of Biology, Agriculture and Healthcare*, 8 (6): 36-41.
- Mallam, I., Kabir, M., Nwagu, B.I., Achi, N.P., Achi, J.N., Alao, R.O. and John, P.A. (2018). Influence of genotype on post-weaning growth performance of domestic rabbits. *Nigerian Journal of Animal Science (NJAS)*, 20(1):17-25.
- Marai, I.F.M., Habeeb, A.A.M. and Gad, A.E. (2002). Rabbit's productive, reproductive and physiological performance traits as affected by heat stress: a review. *Livestock Production Science*, 78:71-90.
- Otchoumou, A.K., Wognin, M.F.R.L., Yao, F.K. and Niamké, S. (2019) Partial replacement of concentrate by *Ipomea batatas* leaves improves litter size and survival of young rabbits (*Oryctolagus cuniculus*). *Scholar Journal of Applied Sciences and Research*, 2(3):04-07.

- SPSS (2010). Statistical Package for Social Science, version 21.0 procedure and facilities for research New York.
- Teguia, A., Ngandjou, H.M., Defang, S. and Tchoumboue, T. (2008). Study of the live body weight and body characteristics of the African muscovy duck (*Cairina moschata*). *Tropical Animal Health Production*, 40:5-10.
- Zeferino, C.P., Komiyama, C.M., Fernandes, S., Sartori, J.R., Teixeira, P.S.S and Moura, A.S. (2013). Carcass and meat quality traits of rabbits under heat stress. *Animal*, 7:518–523.