# NIGERIAN SOCIETY FOR ANIMAL PRODUCTION
# (NSAP)

## Proceedings of

# 35th ANNUAL CONFERENCE

**14TH-17TH MARCH, 2010**

P. 3

## THEME:
## Fast-tracking ANIMAL AGRICULTURE in a Challenged Economy

Held at

**UNIVERSITY OF IBADAN, NIGERIA**


*Edited by:*

O. J. BABAYEMI
O. A. ABU
E. O. EWUOLA


ISSN:1596-5570

**NIGERIAN SOCIETY FOR ANIMAL PRODUCTION**

**PROCEEDINGS 35TH ANNUAL CONFERENCE**

**Editors**

**O. J. Babayemi, O. A. Abu and E. O. Ewuola**

**DEPARTMENT OF ANIMAL SCIENCE**
**FACULTY OF AGRICULTURE AND FORESTRY**
**UNIVERSITY OF IBADAN**

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# EFFECT OF SEX ON CARCASS CHARACTERISTICS OF INTENSIVELY REARED GUINEA PIG (*CAVIA PORCELLUS*)

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## ABSTRACT
*Twenty four (24) weaned non-pedigreed guinea pigs were used to investigate the effect of sex on carcass characteristics and some physical properties of meat. The animals were fed two diets ($T_1$ = low protein and high energy; $T_2$ = high protein and low energy). The experiment lasted for 12 weeks. Parameters studied included: live body weight, slaughtered weight, eviscerated weight, dressing %, as well as the primal cuts and internal organs. Results showed that live body weight, slaughtered weight, eviscerated weight, dressing %, head, hind leg, fore leg, abdominal region, intestinal weight, heart and lungs were all significantly ($p<0.05$) affected. It was concluded that sex has an effect on the carcass characteristics of guinea pigs.*

## INTRODUCTION
National Research Council (1991) defined micro-livestock as inclusive of species that are inherently small such as guinea pig, rabbit, poultry as well as breeds of cattle, sheep, goat and pigs that are less than half the size of most common breeds. There is increasing awareness of the role this class of livestock can play in increasing the choice of animal protein to the Nigerian populace. Jokthan *et al.* (2006) posited that increased guinea pig and pigeon production could help bridge the supply-demand protein gap and fit the production system for subsistence meat production in Nigeria. Guinea pigs can easily be raised by the rural poor as a means of income and also protein. The animal can easily be reared by resource poor peasants who according to Jokthan *et al.* (2006) are outside the cash economy and hence are unable to purchase meat, milk and egg produced by the conventional livestock. The demand by the animal for housing and feed is minimal. Morever, because its management is not a labour intensive enterprise, it is women and children who usually care for them on small farms (Huss and Roca, 1982; Charbonneau, 1988). Ngoupayou (1992) reported that their production in some semi-urban (and peri-urban) areas of Cameroon is a backyard or secondary activity carried out by women and their children.

Sex dimorphism exists among animals as it improves competitive ability and greater opportunity for breeding (Renecker and Hudson, 1997; Gatford *et al.*, 1998). It is possible that such sex dimorphism also exists in the guinea pig and might have an effect on its carcass. The aim of this study therefore was, to determine the effect of sex on carcass characteristics of guinea pig.

## MATERIAL AND METHODS
Twenty four weaned guinea pigs (N = 16 males; N = 8 females) were used for the study. The guinea pigs were sourced locally from within Niger State (Kagara Kotangora and Gwada). They were randomly allotted to two treatments diets each with three replicates of four animals. Treatment 1 guinea pigs were fed a low protein high energy diet (16%CP; 3187.18Kcal/Kg) while those in treatment 2 were fed a high protein low energy diet (22%CP; 2864.81Kcal/Kg). The concentrate diets were supplemented with *Tridax procumbens* and mango leaves. At twelve weeks, three male and three female animals were selected for carcass analysis. The selection was done in such a way that females and males were taken from each treatment in order to minimize the effect of the diet. The selected animals were kept off-feed for 12 hours and slaughtered the next day by severing the jugular vein. The slaughtered animals were hung upside down to ensure proper bleeding under gravity. The bled animals were then scalded in hot water at $80^0C$ to ensure the complete removal of the fur. The scalded animals were then eviscerated, wrapped in polythene bags and taken to the laboratory for further analysis. Physical properties of meat evaluated included cooking yield, cooking loss and water holding capacity.

Data were recorded in grams (g) and expressed as mean and standard error of mean (±SEM). Means were compared using t-test (MINITAB, 2003). Values of $p<0.05$ were considered significant.

**Table 1: Effect of sex on carcass characteristics of guinea pig**

| Trait | Male Mean (±SEM) | Female Mean (±SEM) | Significance |
|---|---|---|---|
| Live weight (g) | 460.00±10.00[a] | 440.00±40.00[b] | * |
| Slaughter weight (g) | 437.50±2.50[a] | 415.00±35.00[b] | * |
| Eviscerated weight (g) | 295.60±0.00[a] | 280.00±20.00[b] | * |
| Dressing % | 66.04±3.63[a] | 63.75±1.25[b] | * |
| **Cut-up parts (% of live weight)** | | | |
| Head | 11.74±0.29[a] | 10.42±0.41[b] | * |
| Fore leg | 11.72±0.46[b] | 13.20±0.74[a] | * |
| Hind leg | 12.29±0.03[b] | 12.80±0.14[a] | * |
| Thoracic region | 12.89±2.79 | 13.84±0.66 | ns |
| Abdominal region | 12.53±0.02[b] | 14.38±0.49[a] | * |
| Intestinal weight | 11.17±0.51 | 11.62±1.86 | ns |
| **Internal organs (% of live weight)** | | | |
| Heart | 0.39±0.02[a] | 0.30±0.01[b] | * |
| Liver | 3.87±0.08 | 4.04±0.26 | ns |
| Lungs | 0.69±0.05[b] | 0.85±0.01[a] | * |
| Kidney | 0.90±0.11 | 0.88 ±0.13 | ns |

* significant ($p<0.05$)
ns = not significant ($p>0.05$)

**Table 2: Effect of sex on cooking yield, cooking loss and water holding capacity of guinea pig meat (%)**

| Parameter | Male Mean (±SEM) | Female Mean (±SEM) | Significance |
|---|---|---|---|
| Cooking yield | 87.99±3.73 | 89.57±0.30 | ns |
| Cooking loss | 12.02±3.73 | 10.43±0.30 | ns |
| Water holding capacity | 16.18±0.28[a] | 15.17±0.56[b] | * |

* significant ($p<0.05$)
ns = not significant ($p>0.05$)

## RESULTS AND DISCUSSION

Means and standard error associated with each of the variables measured for males and females are presented in Table 1. Males were higher ($p<0.05$) in live weight, slaughter weight, eviscerated weight and dressing % than females. Male animals generally tend to be bigger than females and this is reflected in the result obtained in this study. The result observed for the slaughter and eviscerated weight are reflections of the higher body weight of the males. Both male and female animals had high dressing % which goes to show that very little of the meat is wasted. With the exception of the thoracic region and intestinal weight, all the cut-up parts were significantly affected ($p<0.05$). Males had bigger head but smaller fore legs, hind legs and abdominal region. Males also had bigger ($p<0.05$) heart but smaller lung compared to the females.

Table 2 reflects the effect of sex on three physical properties of guinea pig meat evaluated (cooking yield, cooking loss and water holding capacity). Females had higher ($p>0.05$) cooking yield and a corresponding lower cooking loss compared to the males. Males had a higher ($p<0.05$) water holding capacity than females. Water holding capacity is the ability of meat to retain its water (Hedrick *et al.*, 1994) and is an important assessment of meat quality. Water holding capacity has a direct relationship with most other qualities such as flavour, juiciness and tenderness (Omojola, 2006). It is expected therefore that meat obtained from male guinea pigs will be juicier, tenderer and have a better flavour than that obtained from the female. An inverse relationship has been established between fat and water content (Okeudo and Moss, 2005). This means that the more the fat, the lower the water content and vice versa. This explains the lower water holding capacity of meat from female guinea pigs.

## CONCLUSION

The result of this work indicates that sex had an effect on the carcass characteristics of guinea pig.

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