

# The effect of breed, sex and age on body and internal organ weight of chickens used for food security in resource-poor communities

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## Introduction

- There is a growing global poultry production, along with a rising demand for high-quality protein, particularly in developing countries.
- Between year 2000 and 2007, chicken meat production has been reported to have increased by 86% from 58.7 to 109.0 million tons.
- The rapid population increase requires the use underutilized poultry products, such as internal organs of chickens as well as village chicken products to meet the animal protein demand of meat consumers.
- Village chicken breeds exhibit differences in terms of body weight, comb size, and colouration, encompassing aspects such as plumage, eye colour, skin, shank, and earlobe colour, as well as variations in outline and feather contours.
- Internal organ weights are regarded as by-products that are high in trace elements compared to muscular tissues.
- There is a gap in comparing village and broiler chickens reared under the backyard production system.
- Therefore, further research is required to compare the quantity or yield of internal organs in relation to sex, breed and age, and this will suggest breeds to use for improving the productivity of chickens under backyard production system.

## Objective & Hypothesis

- The objective of this study was to determine the effect of sex, breed and age on the body weight and internal organs weight of chickens reared in resource-poor communities. It was hypothesized that sex, breed and age would not affect the weight and internal organs chickens in resource-poor communities.

## Materials and Methods

- Chickens (n=120) were purchased uMgungundlovu district municipality, KwaZulu-Natal province, South Africa (-29.617°S 30.383°E). Comprising of three breeds mainly, (broilers) (n=40), Potchefstroom Koekoek (n=40) and Black Australorp (n=40).

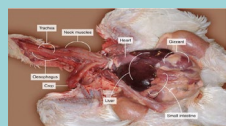


Figure 2



Figure 1

## Statistical Analysis

- Data were analyzed using SAS 9.4 (2023) General Linear Model was used to analyze the effect of breed, sex and age on body weight and internal organs weight.
- We determined the degree of influence of breed and sex on internal organs variables using linear regression and derived a regression equation

## References

- BENYI, K., TSHILATE, T. S., NETSHIPALE, A. J. & MAHLAKO, K. T. 2015. Effects of genotype and sex on the growth performance and carcass characteristics of broiler chickens. *Tropical Animal Health and Production*, 47, 1225-1231.
- Wattanachant, S., Benjakul, S. & Ledward, D. 2004. Composition, color, and texture of Thai indigenous and broiler chicken muscles. *Poultry science*, 83, 123-128.

## Results

- The results showed that broilers had a heavier 2.15±0.81 kg body weight compared to Potchefstroom Koekoek 1.44±0.81 kg and 1.25±0.81 kg the non-descriptive breed.
- The level of significance indicates that breed had an (p<0.001) effect on the body weight of chickens. Males were heavier than females and sex had no effect (p>0.05) on the body weight.
- There was a linear relationship (p<0.05) between body weight and breed, sex and age. A negative coefficient was recorded between body weight and breed but sex and age showed a positive coefficient with the body weight of chickens.
- Age had the strongest relationship on the body weight and liver weight of chickens compared to breed and sex.
- The proportion of variance in the dependent variables (body weight, liver weight, gizzard weight, heart weight, intestine weight and intestine length) was predicted from the independent variables (breed, sex and age).
- A 64% variance in the body weight can be predicted from breed, sex and age, therefore, there is a 64% association between body weight with breed, sex and age.

Table 1 The relationship between breed, sex and age on weight and internal organ weight of chickens

Predictors	Breed	Sex	Age	SEM	Regression co-efficient	R <sup>2</sup>
Body weight	-0.45	0.05	1.18	0.09	0.6530*	0.64
Liver weight	-3.87	-0.63	7.35	2.00	25.75***	0.16
Gizzard weight	-3.05	1.50	0.21	1.29	30.35***	0.12
Heart weight	-0.63	-0.84	-0.45	0.71	11.29***	0.03
Intestine weight	-8.17	-3.14	-10.69	5.99	126.22***	0.06
Intestine Length	-76.60	-0.10	96.90	47.29	264.78*	0.08

## Discussion

- To promote the production of village chickens on a large scale, information on the carcass characteristics such as weight of organs (e.g. liver, heart, intestines) that are commonly consumed within the households and extent of acceptability of the meat is relevant.
- There were notable differences observed between village and broiler chickens in terms of their body weight and internal organs. Broilers had a heavier body weight compared to village chickens, as indicated by Wattanachant et al. (2004) that village chickens breeds have a slow growth rate compared to broilers and this may contribute to their unique meat properties.

## Conclusion

The study concludes that breed and age had an effect on body weight and internal organs of chickens but not sex. Broiler chickens are heavier compared to village chickens and males were heavier than females. Age of the chicken had an effect on the body weight and internal organ weight of the chicken.