Effect of dietary crude fibre level on productivity of indigenous Venda chickens aged one to 91 days

by

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Venda chickens

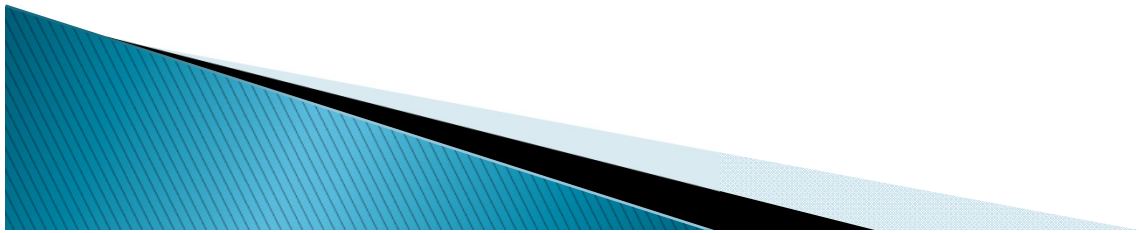
Introduction

-Indigenous Venda chickens are nutritionally, economically and culturally important to rural households of Southern Africa (FAO, 2010).

-However, they are less productive.

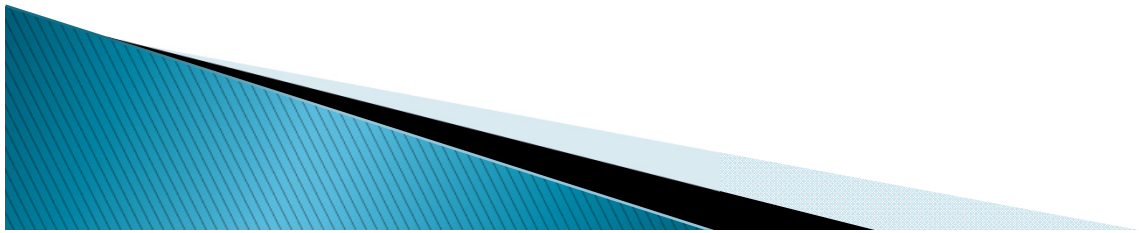
-Venda chickens depend on diets high in CF.

-But CF levels for optimal productivity not known.



Objective:

1. Determine CF levels for optimal productivity of indigenous Venda chickens



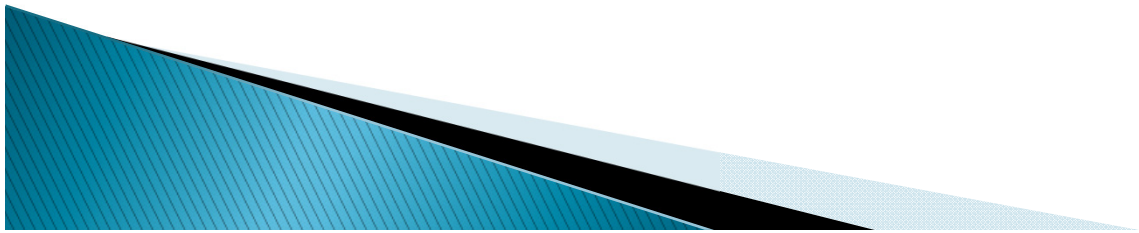
Materials and Methods

Growing Phase (1-49 days)

-120 Venda chicks weighing 37 ± 1.6 g per bird

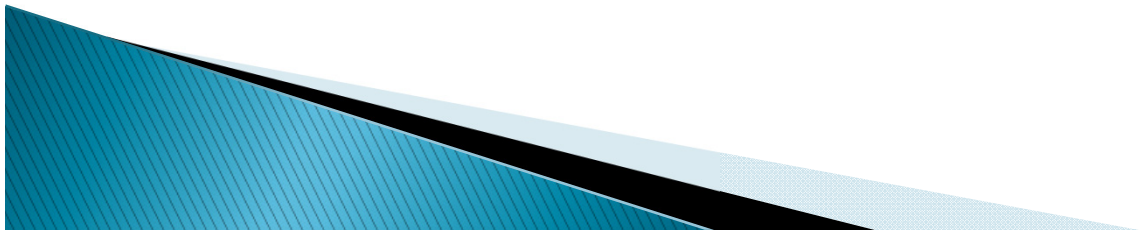
- CRD with 5 dietary treatments (2, 3, 5, 6 and 8 % CF and were labelled VF2, VF3, VF5, VF6 and VF8, respectively). - 4 replicates.

- Similar energy and CP levels (12 MJ ME/kg DM and 18 % CP)



Finishing Phase (50-91 days)

- 80 chickens, 50 days old (mean Lwt 437 ± 12.0 g per bird)
- CRD, (2, 3, 5, 6 and 8 % CF and were labelled MVF2, MVF3, MVF5, MVF6 and MVF8, respectively). 4 replicates
- Similar energy and CP levels (12 MJ ME/kg DM and 18 % CP)



Statistical Analysis:

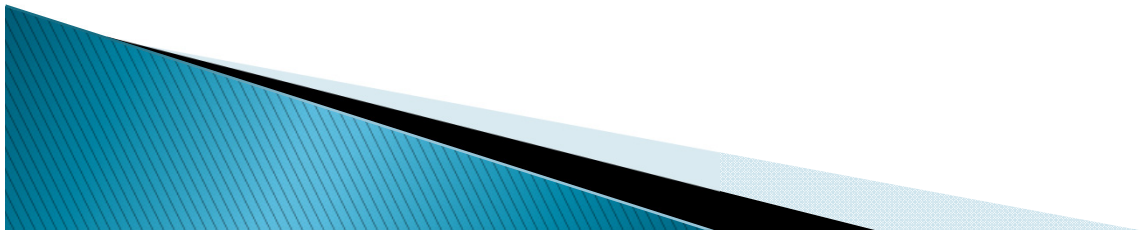
-Analysis of Variance (SAS, 2010)

-Quadratic regression (For CF levels for optimal productivity)

$$\mathbf{Y = a + b_1 x + b_2 x^2}$$

-Linear regression (For relationships)

$$Y = a + bx$$



Results

- Different CF levels optimized different production parameters in Venda chickens
- Negative relationships between CF content and production parameters (ME intake, digestibility, FCR, etc.).
- Positive relationship between CF level & gizzard wt.

Table 1 Effect of CF level on productivity of unsexed Venda chickens aged 1-49 days

Variable	Diet code					
	VF_2	VF_3	VF_5	VF_6	VF_8	SEM
Intake	26^{b}	29^{a}	26^{ab}	25^{b}	25^{b}	0.44
Growth	6.9^{b}	9.8^{a}	7.5^{b}	6.9^{b}	6.8^{b}	0.32
FCR	3.8^{a}	3.0^{b}	3.6^{ab}	3.6^{ab}	3.8^{a}	0.10
Lwt	375^{b}	517^{a}	395^{b}	374^{b}	370^{b}	15.6
ME	9.4^{a}	9.7^{a}	8.8^{ab}	7.2^{b}	6.9^{b}	0.3
CFD	41.4^{a}	42.9^{a}	38.8^{b}	29.5^{c}	26.8^{c}	1.45
N-re.	0.43^{ab}	0.51^{a}	0.42^{a}	0.32^{b}	0.30^{b}	0.022
Mortality	2.5	2.5	2.5	2.5	3	0.2

a, b, c : Means in the same row not sharing a common superscript are different ($P<0.05$)

Table 2 Dietary CF levels for optimal productivity of Venda chickens aged 1-49 days

Trait	Formula	CF level	Optimal Y-value	r^2
Growth rate	$y = 7.22 + 0.51x – 0.08x^2$	3.4	8.07	0.264
FCR	$y = 3.86 – 0.24x + 0.03x^2$	4.0	3.38	0.247
Live weight	$y = 402.50 + 18.22x - 3.03x^2$	3.0	429.86	0.245

CF level: Level of dietary crude fibre for optimal Y-value

r^2 : Coefficient of determination

Table 3 Relationships between CF level and production parameters in Venda chickens aged 1-49 days

Variable	Formula	r^2	Probability
Feed intake	Y = 28.112 – 0.379x	0.694	0.044
ME	Y = 10.751 – 0.491x	0.847	0.027
N-retention	Y = 0.542 – 0.030x	0.711	0.054
CF digestibility	Y = 49.400 – 2.817x	0.856	0.024

r^2 : Coefficient of determination

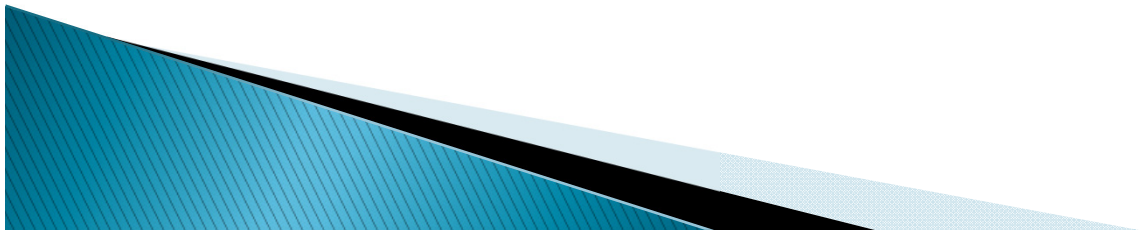


Table 4 Effect of CF level on productivity of male Venda chickens aged 50-91 days

Variable	Diet code					
	MVF_2	MVF_3	MVF_5	MVF_6	MVF_8	SEM
Intake	57^{b}	79^{ab}	85^{a}	88^{a}	88^{a}	3.55
Growth	7.8^{b}	10.9^{a}	8.8^{ab}	9.0^{ab}	7.2^{b}	0.353
FCR	7.4	7.3	10.2	9.8	12.5	1.68
Lwt	1024^{b}	1065^{a}	1030^{b}	984^{c}	924^{d}	29.8
ME	14.2^{a}	10.7^{b}	10.4^{b}	10.5^{b}	7.4^{c}	0.49
N-retention	1.47^{b}	1.54^{ab}	1.58^{ab}	1.65^{a}	1.17^{c}	0.041
CFD	88.3^{a}	67.0^{b}	65.0^{b}	65.1^{b}	45.4^{c}	3.15

a, b, c : Means in the same column not sharing a common superscript are significantly different ($P<0.05$)

SEM : Standard error of the means

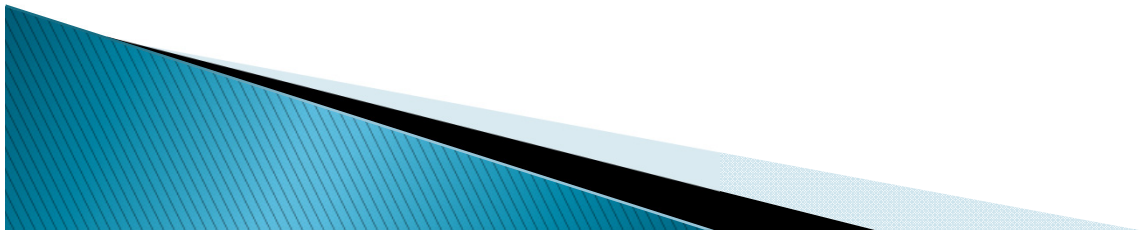


Table 5 CF levels for optimal productivity of male Venda chickens aged 50-91 days

Trait	Formula	CF level	Optimal Y-value	r^2
Intake	$Y = 30.254 + 18.153x - 1.377x^2$	6.5	90.08	0.899
N-retention	$Y = 0.950 + 0.316x - 0.036x^2$	4.4	1.64	0.898
Growth rate	$Y = 6.129 + 1.644x - 0.192x^2$	4.3	9.65	0.525
Live weight	$Y = 990.566 + 34.250x - 5.414x^2$	3.2	1045	0.918

CF level : Level of dietary crude fibre for optimal Y-value

r^2 : Coefficient of determination

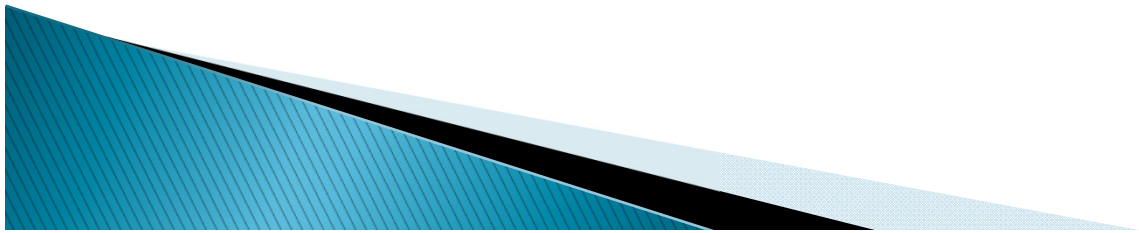
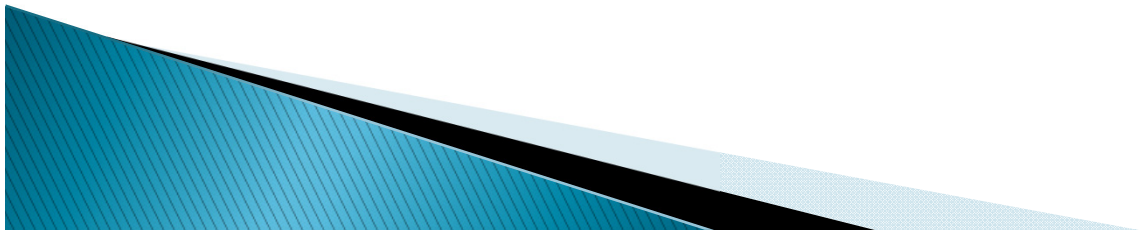


Table 6 Relationships between CF and production parameters of male Venda chickens aged 50-91 days

Variable	Formula	r^2	Probability
FCR	Y = 5.256 + 0.871x	0.919	0.008
ME	Y = 14.977 – 0.904x	0.709	0.035
CF digestibility	Y = 93.832 – 5.765x	0.620	0.034

r^2 : Coefficient of determination



Conclusion

Indigenous Venda chicken production parameters were optimized at different CF levels. However, CF levels for optimal productivity were higher at finisher phase than at the grower phase. Generally, CF levels for optimal productivity were higher in Venda chickens than those for broiler chickens.

THANK YOU

TAWONGA