South African Journal of Animal Science 2000, 30 (Supplement 1)

Short paper and poster abstracts: 38th Congress of the South African Society of Animal Science

The chemical body composition of four South African commercial broiler strains

#L.C. Hoffman, P.P. Fisher and G. Ferreira
Department of Animal Sciences, University of Stellenbosch, P Bag X1, Matieland, 7602
#Email: lch@maties.sun.ac.za

Introduction

Although numerous data is available on the growth rate and feed conversion ratios of various broiler strains, data on meat quality is however, scarce. The effect of strain on the production and carcass composition of broilers was evaluated in the present investigation.

Material and Methods

The growth, feed conversion and carcass characteristics of four commercial broiler lines commonly used in South Africa (A, B, C and D) were evaluated under identical commercial conditions. Line A was an intermediate maturing animal bred for growth at low altitudes whilst line B (intermediate maturing) was bred for higher altitudes. Line C is a chicken line selected for early maturing within the 42 d cycle whilst line D is late maturing. The broilers and feed consumption were weighed every week. Mortalities were recorded daily. Feed conversion (g feed per body mass - FCR) was calculated after adding the cumulated mortality weights for each pen to the total bird mass of that pen. At the end of the trial (day 42), ten birds (5 male and 5 female) from each line were randomly removed and slaughtered using standard abattoir procedures. The breast and thigh + drumstick (includes skin and bone) from each bird was then analysed for chemical composition using standard laboratory techniques. Data was analysed using standard statistical procedures (SAS, 1989).

Results and Discussion

The average final body weight and food conversion ratio of the four chicken strains over the 42 day growth period are depicted in Table 1. Strain C (the early maturing strain) had a statistically faster growth rate and the lowest FCR – a phenomenon in line with its selection history.

Table 1 The production parameters and carcass chemical composition of four broiler strains

Parameter	Strain			
	A	B	C	D
Final body weight (kg)	2.188 [a]	2.150 [a]	2.277 [b]	2.176 [a]
FCR	2.0121 [a]	2.1026 [b]	1.9988 [a]	2.0302 [a]
Chemical composition				
Breast				
Moisture	70.76 [ab]	70.67 [ab]	71.76 [a]	69.91 [b]
Protein	21.35	21.27	20.52	20.76
Lipid	6.86 [a]	7.18 [a]	7.64 [ab]	8.87 [b]
Ash	1.28 [ab]	1.21 [ab]	1.07 [a]	1.46 [b]
Thigh + drumstick				
Moisture	70.97 [ab]	69.19 [a]	71.61 [b]	71.60 [b]
Protein	17.71	17.72	18.51	18.74
Lipid	10.73 [ab]	12.29 [a]	9.35 [b]	9.15 [b]
Ash	0.93	1.16	1.08	0.96

[ab] values with the same superscript do not differ statistically (P > 0.05)

There was no difference in body chemical composition between the sexes and the resulting data was therefore pooled for further statistical analysis. The thighs + drumsticks had higher lipid and lower protein values than the breast over all the strains. Within the carcass portion, strain did not affect the protein composition. Within the breasts, Strain D had the highest lipid content and Strain A, the lowest. However, Strain B had the highest lipid content in the thigh and Strain D the lowest.

Conclusion

The final body weights indicate that strain C, which is classified in the trade as being early maturing, also grew the fastest. Within the breast portion, it is surprising to find that the late maturing strain (D) had the highest lipid content, as lipid tends to be one of the last tissue types to be deposited, however, in the thigh + drumstick portion, strain D had the lowest lipid content. For both portions, the lipid contents of the early (C) and late maturing (D) strains did not differ from each other. This result raises the question of whether these two strains actually differ in maturing type, or whether they only differ in growth rate. More research would seem to be required to clarify this issue. The higher lipid content in the thigh + drumstick portions compared to the breast, irrespective of strain, is in line with other findings (Williams & Damron, 1998).

References

Williams, S.K. & Damron, B.L., 1998. Poult. Sci. 77, 329.
SAS Institute Inc. (1989). SAS/STAT user's guide, version 6. Cary. USA.