

DECLARATION

I declare that the dissertation hereby submitted to the University of Limpopo for the degree of Master of Agriculture (Animal Nutrition) has not previously been submitted by me for a degree at this or any other university, that it is my own work in design and execution, and that all material contained therein has been duly acknowledged.

Name: Mbajjorgu Christian A.

Signature.....

Date.....

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Above all, I am most sincerely thankful to the Almighty God, for His strength, comfort and wisdom. Glory be to the Father, the Son and the Holy Spirit, Amen.

DEDICATION

This dissertation is dedicated to my lovely mother Elizabeth Mbajorgu and late father Charles Mbajorgu for their support in educating me.

ABSTRACT

Two experiments were conducted to evaluate the effect of time of initiation of feeding after hatching and influence of dietary lysine and ascorbic acid supplementation on productivity, carcass characteristics and mortality of Ross 308 broiler chickens. The first experiment examined the effect of time of initiation of feeding after hatching and influence of dietary lysine supplementation during realimentation on productivity, carcass characteristics and mortality of Ross 308 broiler chickens during the winter period. Three hundred and sixty unsexed Ross 308 broiler chickens with an initial weight of 30 ± 2 g per bird were assigned to twelve treatments with three replications of ten birds each in a 4 (times of initiation of feeding) x 3 (lysine supplemental levels) factorial, complete randomized design. At each time of initiation of feeding after hatching during the starter and grower stages, the diets were isocaloric and isonitrogenous but with three different lysine supplementation levels. Lysine supplementation started three days after hatching.

Time of initiation of feeding above 36 hours after hatching resulted in growth retardation and high mortality rate. More than 50 % of the birds died between one and three days of age when initiation of feeding after hatching was above 36 hours. However, the birds 'caught-up' at the latest within eight days of realimentation. This compensatory growth could be explained in terms of higher intakes. Lysine supplementation during realimentation reduced the number of days of 'catch-up' irrespective of time of initiation of feeding after hatching. Generally, the higher the level of lysine supplementation, the lower was the number of days of 'catch-up' upon realimentation. Thereafter, time of initiation of feeding after hatching and lysine supplementation had no effect ($P>0.05$) on live weight, feed intake, growth rate, feed conversion ratio, diet digestibility, nitrogen content of breast meat, dressing %, carcass characteristics and mortality of Ross 308 broiler chickens.

The second experiment examined the effect of time of initiation of feeding after hatching and influence of dietary ascorbic acid supplementation on productivity, carcass characteristics and mortality of Ross 308 broiler chickens during the summer period. Six

hundred and seventy five unsexed Ross 308 broiler chickens with an initial weight of 32 ± 2 g per bird were assigned to fifteen treatments with three replications of fifteen birds each in a 3 (times of initiation of feeding) x 5 (ascorbic acid supplemental levels) factorial, complete randomized design. Ascorbic acid supplementation started 3 days after hatching. An average of 18 % and 31 % of the birds died between one and three days of age when initiation of feeding after hatching was above 36 hours. However, the birds 'caught-up' within ten days of realimentation irrespective of time of initiation of feeding after hatching. This compensatory growth could be explained in terms of reduced maintenance requirement and possibly, increased efficiency of growth. Following 'catch-up', ascorbic acid supplementation during realimentation lowered ($P < 0.05$) mortality rate and improved growth rates irrespective of time of initiation of feeding after hatching. Growth rate increased incrementally with increasing levels of ascorbic acid supplementation within each time of initiation of feeding after hatching. Improved growth rate in the ascorbic acid supplemented birds resulted in improved live weight in comparison with those without ascorbic acid supplementation at 21 days of age and continued until 42 days of age. Live weight increased incrementally with increasing levels of ascorbic acid supplementation within each time of initiation of feeding after hatching. Similarly, increasing ascorbic acid supplementation within each time of initiation of feeding after hatching increased dressing percentage and breast meat yield at 42 days old. However, ascorbic acid supplementation had no effect ($P > 0.05$) on feed intake of the birds irrespective of time of initiation of feeding after hatching.

In both experiments, mortality was positively and strongly correlated with time of initiation of feeding after hatching while live weight was negatively and strongly correlated with time of initiation of feeding after hatching.

It is concluded that time of initiation of feeding above 36 hours after hatching is not desirable, mainly because of its effect on mortality. However, lysine supplementation in the diet of broiler chickens subjected to delayed initiation of feeding after hatching might play a key role in accelerating the rate of 'catch-up' growth response.

It is also concluded that the beneficial effect of ascorbic acid supplementation could be exploited in reducing mortality rate and improving growth rates in broiler chickens subjected to delayed initiation of feeding after hatching.

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