EFFECT OF PROTEIN LEVEL IN THE DIET OF NAKED NECK HENS ON EGG PRODUCTION, HATCHABILITY AND CHICK PRODUCTIVITY

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DECLARATION

I declare that this dissertation hereby submitted to the University of Limpopo for the degree of Master of Agricultural Management (Animal Production) has not been submitted by me for the degree at this or any other University, this is my own work in design and execution, and that all material contained herein has been acknowledged.

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DEDICATION

This dissertation is dedicated to my mother, Florence, and my father, Neam Mohlala, for supporting and raising me.

ABSTRACT

A study was conducted to examine the effect of protein level of the diet of Naked neck hens on egg production, hatchability and chick productivity. The first part of the experiment determined the effect of protein level on feed intake, number of eggs produced, egg weight, egg white nitrogen content, egg yolk nitrogen content, egg hatchability and chick hatch-weight. A total of 25 hens aged 30 weeks were confined in cages and fed diets differing in protein content. A complete randomized design, comprising of diets differing in protein levels ($P_{12.94\%}$, $P_{13.94\%}$, $P_{14.38\%}$, $P_{15.75\%}$ and $P_{18.13\%}$ CP), replicated five times with one hen in each replicate was used. Semen was collected from one cock to fertilize all hens. Protein level had an effect on ($P<0.05$) feed intake and egg white nitrogen content. However, protein level of the diet of hens had no effect ($P>0.05$) on the number of eggs produced, egg white nitrogen content, egg yolk, egg weight, egg hatchability and chick hatch-weight. Quadratic analyses indicated that feed intake, number of eggs produced, egg weight, egg white nitrogen content, egg yolk nitrogen content, hatchability and chick hatch-weight were optimized at different protein levels of 14.7 (r^2 = 0. 623),14.9 (r^2 = 0.568), 13.9 (r^2 = 0.094), 18.2 (r^2 = 0.563), 15.1(r^2 = 0.424), 15.9 (r^2 = 0.451) and 15.9 % (r^2 = 0.898) , respectively.

The second part of the experiment determined the effect of protein level of hens on productivity of their progenies from a day old up to 13 weeks of age. A total of 95 chicks hatched from the first part of the study were assigned to 20 floor pens according to the number of chicks hatched. Chicks had an average initial live weight of 35 ± 2 g per bird. The chicks were fed the same commercial grower diet and fresh water *ad libitum* up to seven weeks of age. Protein level of the diet of Naked neck hens had an effect ($P<0.05$) on feed intake, live weight and feed conversion ratio of chicks from a day old up to seven weeks of age. However, protein level of the diet of Naked neck hens had no effect ($P>0.05$) on growth rate and mortality of chickens from a day old to seven weeks of age. Feed intake, feed conversion ratio, growth rate and mortality of chickens were optimized at

different protein levels of 15.8 (r^2 = 0.298), 16.1 (r^2 = 0.236), 16.1 (r^2 = 0.077) and 14.3 % (r^2 = 0.617), respectively.

Protein level of the diet of Naked neck hens had no effect (P>0.05) on feed intake, growth rate and feed conversion ratio of both their male and female progenies between eight and 13 weeks of age. Protein levels of the diet of hens had an effect (P<0.05) live weight of their male progenies and carcass weights of both their male and female progenies at 13 weeks of age. However, the level of protein of the diet of hens had no effect (P>0.05) on live weight of their male progenies, and breast meat yield, breast meat nitrogen content and fat pad weight of both their male and female progenies at 13 weeks of age. Live weight, breast meat yield, breast meat nitrogen content and fat pad weight of their male progenies at 13 weeks of age were optimized at different protein levels of the diets of hens of 18.9 (r^2 = 0.666), 15.6 (r^2 = 0.081), 15.4 (r^2 = 0.786) and 17.7 % (r^2 = 0.775), respectively. Similarly, live weight, carcass weight, breast meat yield, breast meat nitrogen content and fat pad weight of their female progenies at 13 weeks of age were optimized at different protein levels of 15.7 (r^2 = 0.294), 15.4 (r^2 = 0.180), 15.8 (r^2 = 0.059), 15.1 (r^2 = 0.882) and 16.1 % (r^2 = 0.405), respectively.

It is concluded that protein level of the diet of the hen may affect its productivity and that of its progeny. However, the calculated protein levels for optimum productivity will depend on the production parameter in question.

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