Manipulating Broiler Breeder Female dietary Protein:energy ratio to modify carcass composition

E. T. Mba, R. A. Renema, A. Pishnamazi and M. J. Zuidhof

Summary

- Feeding practices can be used to modify carcass composition in broiler breeders.
- The current study consists of three phases (growth, sexual maturity and production phases).
- The growth phase is designed to examine the impact of crude protein:energy composition during rearing.
- Results show that at 12 and 19 dietary crude protein had a greater impact on breast muscle.
- Difference in feeding level did not impact growth as measured by shank or keel length.

The problem

- Major changes in poultry management have taken place recently.
- Examples are feed restriction for broiler breeders and recently sex-separate feeding programs.
- These feeding programs coupled with increased genetic selection have been done to increase breast muscle yield of modern strains.
- Strains with high potential for breast muscle growth have an increased maintenance requirement in order to maintain this metabolically active tissue.
- To support very rapid growth rates, higher protein intakes have been recommended for these broiler breeders.
- However, there is little understanding of the impact of high protein diets on broiler energetics.

Objectives

- Impact of crude protein:Energy ratio on body composition

Our Approach

- 1140 Ross 708 broiler breeder females were reared.
- Birds were allocated 30 pens (38/pen) and fed common starter ration for 3 wk to reach common BW.
- From 3 wk birds were randomly assigned to a 3X2 factorial design (feeding program):
- Three energy levels (High Energy (2950kcal), standard energy (2800kcal) & low energy (2600kcal)
- Two protein levels (low protein (14%) & high protein (16%)).
- Individual BW, feed intake and frame size was recorded every 2wk.

Our observations

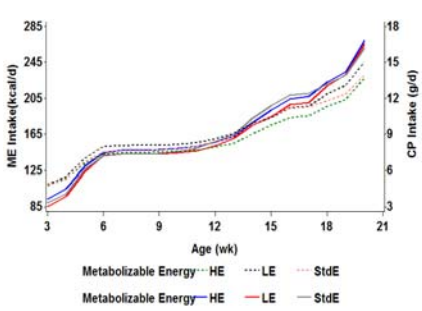

Fig. 1: Effect of MEI and CPI on average daily feed intake ADFI

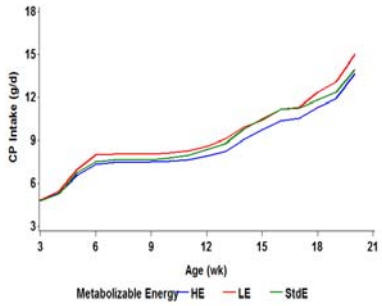

Fig. 2: Effect of CPI on MEI

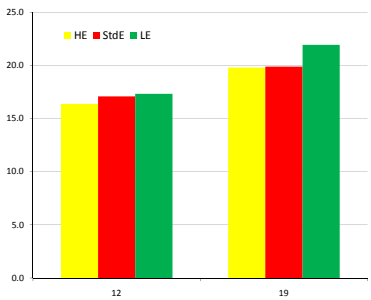

Fig. 3: Effect of energy (MEI) on percentage breast muscle

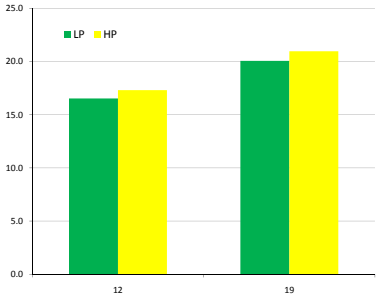

Fig. 4: Effect of crude protein (CPI) on percentage fatpad

What the results mean

- Birds on LE had higher average feed intake than HE and STD diet to maintain the same body weight.
- LE diet resulted in higher CPI which increased breast muscle weight than HE diet.
- LP diet increased percentage fatpad deposition.
- The results mean that feed restriction programs using lower energy and higher protein diet is important to increase breast muscle and reduce percentage fatpad.
- Thus, this feed combination could provide the energetic requirements for final maturation and early egg production.

Acknowledgments

Alberta Agricultural Research Institute, Agriculture and Food Council, Alberta Chicken Producers, Poultry Industry Council, and Aviagen for funding this research. Thanks to the PRC.

Contact information

R. A. Renema, Robert.Renema@ales.ualberta.ca
M. J. Zuidhof, martin.zuidhof@ualberta.ca
E. T. Mba, emba@ualberta.ca