

# Turkey Poult Response to Dietary Protein and Energy

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Past reports have indicated the influence of turkey poult starting diets that varied in amino acid density on poult performance and subsequent weight at market (Noll et al 2013, 2014). The one study showed that tom poult are very responsive to amino acid levels with changes in body weight and that initial diet amino acid density has long term effects to market. Some differences in the response curve were observed and perhaps indicated that the dietary energy level may have limited the response.

Additional studies were conducted to determine the response of male turkey poults to the ratio of digestible lysine (dlys) to metabolizable energy (ME) in starting poult diets to 6 wks of age with goal of determining an optimal dlys/ME ratio. A factorial combination of diets consisted of two ME levels and 4 dlys/ME ratios. Hybrid male poults were placed into bedded pens with six replicate pens per dietary treatment. Starting diets (0-2 wks of age) were formulated to metabolizable energy levels of 2900 (L) and 3050 (H) kcal/kg with digestible lysine to ME ratios (dlys/ME) of .52 to .6% digestible lysine per 1000 kcal/kg at each energy level for a total of 8 diets. For the 2 to 6 wk feeding period, ME levels were increased by 50 kcal/kg with digestible lysine to ME ratios increasing from .44 to .54 (% per 1000 kcal/kg). Range in digestible lysine content for the L and H diets for 0 to 2 wks was 1.52 to 1.74% and 1.60 to 1.83%, respectively. Range in digestible lysine content for the L and H diets for 2 to 6 wks was 1.30 to 1.59% and 1.36 to 1.67%, respectively. Diets were formulated on an ideal amino acid ratio basis and energy levels adjusted with supplemental fat and changes in corn and soybean meal levels. Diets contained animal byproduct in the form of poultry byproduct meal and were supplemented with phytase (500 FTU/kg). Diets also contained a coccidiostat and antibiotic growth promotant. Feed form was mash.

Dietary ME and dlys/ME affected performance through 6 wks of age. During 0-2 wks of age, factors of ME and dlys/ME affected BW and feed efficiency ( $P < .05$ ). Weak interactions of ME and dlys/ME were observed for BW and feed intake ( $P < .10$ ). Increasing diet ME or increasing dlys/ME resulted in increased weight and improved feed efficiency. Poults fed diets containing 2900 kcal/kg ME tended to not increase body weight any further when dlys/ME was greater than .555% while poults fed 3050 kcal/kg tended to increase body weight to .6% dlys/ME.

During 2 to 6 wks of age, factors of ME and dlys/ME affected BW, feed intake and feed efficiency ( $P < .05$ ). Interactions of ME and dlys/ME were observed for BW and feed intake ( $P < .05$ ). Increasing diet ME or increasing dlys/ME resulted in increased weight and feed intake; and, improved feed efficiency. Through 6 wks of age, mortality and removal due to stunting, was greater at lower dlys/ME ratios and with the lower ME regimen. Similar to the 0 to 2 wk period, response to dlys/ME was limited with the lower ME diet. Poults fed diets containing 2950 kcal/kg ME did not increase body weight any further when dlys/ME was greater than .47% while poults fed 3050 kcal/kg increased body weight to .54% dlys/ME.

In summary, poults fed the higher energy regimen improved body weight to a greater extent as dlys/ME ratio increased when compared to the lower energy regimen. Poult body weight was not equivalent for similar dlys/ME ratios at different ME levels because poults on the higher ME

diets either had similar feed intake (0-2 wks) or had higher feed intake levels (2-6 wks) in comparison to the lower ME regimen. Starting dietary dlys/ME ratio should be .575% based on weight and livability.

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