

ash, and protein. Results showed no significant differences among treatments for total feed intake, average daily intake, total body weight gain, average daily gain, and feed efficiency. Dressing percentage and non-carcase components were not significantly different among treatments. No significant differences were found among treatments for protein, ash, fat, and moisture. Color was not significantly different for L\* (lightness) and a\* (redness) values among treatments, however, PF was different ( $P < 0.05$ ) from CO for b\* (yellowness) values with readings of 11.28 and 4.92, respectively. This indicated that broilers fed PF developed more yellow pigmentation compared with those fed CO. Based on the parameters evaluated in this study; the 4 fat sources had similar impact on the performance of broiler chickens.

**Key Words:** broiler, fat, meat quality, performance, color

**P414 Performance and egg quality from Japanese quail fed autoclaved castor bean meal.** A. C. S. Pimentel<sup>1</sup>, M. C. M. M. Ludke<sup>\*1</sup>, J. V. Ludke<sup>2</sup>, C. B. V. Rabello<sup>1</sup>, J. C. N. Santana<sup>1</sup>, A. G. Faria<sup>1</sup>, and P. S. Pereira<sup>1</sup>, <sup>1</sup>Universidade Federal Rural de Pernambuco, Recife, Pernambuco, Brazil, <sup>2</sup>Embrapa Swine and Poultry, Concórdia, Santa Catarina, Brazil.

The experiment was run to evaluate the effect of increasing levels of autoclaved castor bean meal (ACM) in Japanese quail (*Coturnix coturnix japonica*) diets. During the laying phase egg production and quality traits were evaluated in 3 cycles of 21 d. Quails (n = 210) were selected by production and weight uniformity and distributed in a completely randomized design with 5 treatments (0, 7, 14, 21 or 28% of ACM in diet), 7 replicates of 6 quails per plot. The ACM were produced by mixing of 6% calcium oxide to untreated castor bean meal, cold water adding (1:1 w/w), autoclaving (1.23 kgf/cm<sup>2</sup> by 90 min), sun drying and grinding. ACM had 90.30% dry matter, 27.92% crude protein (CP), 27.62% crude fiber, 9.68% ether extract, 4.95% calcium, 0.89% phosphorus and 2267 kcal/kg of metabolizable energy (ME, value determined in quail metabolism trial). The diets were isoproteic (22% CP), isoenergetic (2850 kcal of ME/kg) and formulated to a total amino acid basis. Parameters evaluated were: feed intake (FI, g/bird/day), egg production rate (EPR, %), egg weight (EW, g), egg mass (EM, g/bird/day), feed to egg mass ratio (FEM, g/g) and feed to dozen egg ratio (FDE, g/dozen), specific gravity (SG), Haugh unit (HU), yolk weight (YW, g) and percentage (YP, %), shell weight (SW, g) and percentage (SP, %), shell thickness (ST, mm), albumen weight (AW, g) and percentage (AP, %). Data were evaluated by ANOVA and polynomial regressions at 5% of probability were performed. Results showed no significant differences ( $P > 0.05$ ) in FI, FDE, ST, HU, AP and YP. The EPR ( $P = 0.0234$ ), EM ( $P = 0.0142$ ), FEM ( $P = 0.0034$ ) and AW ( $P = 0.0264$ ) had quadratic effects with the best level at 14.10%, 14.13%, 20.93% and 13.95% of ACM, respectively, giving a maximum of EPR of 90.92%, EM of 9.8 g/d, the best FEM of 2.86 g/g and maximum AW with 6.12 g. But, EW, SG, SW and SP and YW showed that increasing ACM in diet reduced lineally ( $P < 0.001$ ) these parameters. ACM can be used in feed for laying Japanese quails at levels up to 14% without compromising the main production parameters.

**Key Words:** alternative feedstuff, *Coturnix coturnix japonica*, egg production, feedstuffs processing

**P415 Determination of volatile fatty acid profile in the ceca, large intestine, and fecal material of broilers fed diets containing different ingredient profiles.** H. Walters<sup>\*1</sup>, M. P. Williams<sup>1</sup>, T. A. Wickersham<sup>2</sup>, J. Klein<sup>1</sup>, and J. T. Lee<sup>1</sup>, <sup>1</sup>Department of Poultry

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Producers are including alternative feed ingredients in an effort to reduce diet costs. Understanding digestive and metabolic changes with inclusion of alternative feed ingredients is essential to their inclusion. Therefore, an experiment was conducted to evaluate volatile fatty acid (VFA) concentration in the ceca, large intestine and fecal material of 7 week old broiler males fed distillers' grains. The experiment consisted of 3 dietary treatments to include a standard corn soybean meal diet, a diet containing 15% de-oiled dried distillers grains with solubles (LO-DDGS), and diet containing 15% dried distillers grains (DDG) all formulated to be iso-nitrogenous and iso-caloric. These diets were selected in an effort to influence gastrointestinal tract fermentation with increasing diet fiber levels. At 7 weeks of age, 10 broilers per dietary treatment were moved to individual bird cages to allow for fecal collection. To determine the effect of collection time on VFA recovery, feces were collected immediately upon defecation, 15 min, and 30 min following defecation. Upon collection of the fecal material, each broiler was killed and large intestine and ceca removed for sample collection. VFA concentration and profile were compared with via Analysis of Variance using the General Linear Model. Total VFA production was elevated with the addition of 15% LO-DDGS and DDG in the large intestine and ceca with a significant increase being observed in the fecal material. Additionally, the percentage of acetate was reduced while the percentage of butyrate was increased with the inclusion of DDGS and DDG as compared with the corn soybean meal diet. Regression analysis of the fecal VFA recovery showed that increasing sampling times did not influence VFA recovery as the slope within each treatment was zero. These data confirm that fecal VFA profile and concentration are influenced by dietary ingredient profile.

**Key Words:** broiler, distillers grain, volatile fatty acid

**P416 Evaluation of a post-extraction algal residue as a feed ingredient in broiler and laying hen diets.** J. Price<sup>\*1</sup>, T. A. Wickersham<sup>2</sup>, M. P. Williams<sup>1</sup>, J. Klein<sup>1</sup>, and J. T. Lee<sup>1</sup>, <sup>1</sup>Department of Poultry Science, Texas A&M Agrilife Research, College Station, <sup>2</sup>Department of Animal Science, Texas A&M Agrilife Research, College Station.

Two experiments were conducted to evaluate the inclusion of post-extraction algal residue (PEAR) in laying hen and young broiler diets. The PEAR was determined to contain 20.2% crude protein, 6.18% calcium, 6.61% sodium, and 1.56% fat and a complete amino acid, vitamin, and mineral analysis was conducted before diet formulation. In experiment 1, 5 increasing concentrations (0, 5, 10, 15, and 20%) of PEAR were included in 31 week old White Leghorn laying hen diets. Hens were fed the diets for a period of 5 weeks. During the experiment, parameters evaluated included weekly feed consumption, egg production, egg weight, interior egg quality. All data were analyzed via a one-way Analysis of Variance using the General Linear Model. Increasing concentrations of PEAR had no effect of egg production or feed consumption throughout the experiment, however, yolk color was increased ( $P < 0.05$ ) with the feeding of 10% PEAR following 2 weeks of consumption. In experiment 2, 5 increasing concentrations (0, 2.5, 5, 7.5, and 10%) of PEAR were fed to broilers through 3 weeks of age to determine the effect on feed consumption, body weight, and feed conversion ratio. Additionally, fecal moisture percentage of evaluated on 20 d of age due to the high sodium content of the PEAR. Inclusion of PEAR did not negatively affect feed consumption, body weight, or feed conversion ratio throughout the 3 week experiment however an increase ( $P < 0.05$ ) in fecal moisture was