Effects of the inclusion of oat hulls or sugar beet pulp in the diet on gizzard characteristics, apparent ileal digestibility of nutrients, and microbial count in the ceca in 36-day-old broilers reared on floor. E. Jimenez–Moreno*, C. Romero, J. D. Berrocoso, M. Frikha, and G. G. Mateos, University Polytechnic of Madrid, Madrid, Spain.

The effects of the inclusion of oat hulls (OH) and sugar beet pulp (SBP) in the diet on gizzard characteristics, apparent ileal nutrient digestibility (AID), and Clostridium perfringens, Enterobacteriaceae, and Lactobacillus proliferation in the ceca were studied in 36-day-old broilers. There were a control diet with a low CF content (1.61%) and 2 additional diets that resulted from the dilution of this feed with 5% of either OH or SBP. Each treatment was replicated 7 times (10 chicks each) and birds were kept on pens with straw as bedding. Only one of the chicks of each of the replicates was used for microbiology counts. Broilers fed additional fiber had heavier gizzards (P ≤ 0.001) with higher digesta contents (P ≤ 0.001) and lower pH (P ≤ 0.01) than those fed the control diet. More digesta was retained in the gizzard with SBP than with OH inclusion, a finding that was presumably related with the higher water holding and swelling capacity of the SBP. Neutral detergent fiber, acid detergent fiber, and acid detergent lignin content of gizzard digesta were increased (P ≤ 0.001) with OH but not with SBP inclusion. The AID of starch was higher (P = 0.05) with OH than with SBP inclusion, with that of the control diet being intermediate. However, the AID of CP was not affected by diet. The inclusion of OH but not of SBP, reduced cecal counts of Cl. perfringens (P ≤ 0.05), Enterobacteriaceae (P ≤ 0.01), and Lactobacillus (P = 0.08). The data suggest that the inclusion of OH, a lignified insoluble fiber source, improves gizzard function and AID of starch and reduced cecal pathogen microbial count in 36-day-old broilers. Under practical conditions, feeding OH may be used to improve nutrient digestibility and control microbial growth in the gastrointestinal tract of broilers.

Key Words: fiber sources, gizzard characteristics, ileal nutrient digestibility, cecal microbial count, broiler


The increased interest in becoming ‘green’ for consumers and companies is driving groups to develop innovative ways to become more efficient and reduce their waste. Foods past their expiration dates are large sources of waste and are causing food-manufacturing companies to develop waste disposal strategies. Integrating by-products of these companies into animal diets, specifically that of laying hens, could be significantly more cost effective for both the human food manufacturer and the agricultural producers. The study’s objective is to evaluate laying hen diets containing snack food by-product, consisting mostly of expired potato chips, and the impact on hen performance and feeding behavior. One hundred and ninety-two white Leghorn laying hens (45 wks old) were selected from the MSU Poultry Farm. Hens were housed in conventional cages (3 birds/cage) and received one of 4 diets for 4 wks: 1) industry standard corn-soybean meal control 2) control with 6% by-product and 4) control with 9% by-product. Diets were formulated to be isocaloric, isonitrogenous, and balanced for sodium. Feed intake was measured for 3 consecutive days each wk. During the first wk, feed intake was significantly higher in birds fed the 6% and 9% diets compared with those fed control (P < 0.05). Birds fed the 9% had a higher feed intake than control again during the fourth wk (P < 0.01). Egg production, egg weight, and specific gravity were measured weekly. Hen body wt was measured on day one and every 2 weeks thereafter. Egg production, egg wt, specific gravity, and body weight were not significantly affected by the addition of snack food by-products to the diet. In conclusion, the addition of expired snack food by-product into poultry diets does not significantly effect laying hen egg production and has the potential to be used as an alternative feed stuff in the future.

Key Words: snack, egg, laying, hen