

475P The estimation of body composition of broilers chicken from 7 to 35 days of age by dual energy x-ray absorptiometry (DXA). M. Hamdi*, I. Lachance, and M. P. Létourneau-Montminy, *Université Laval, Ville de Québec, QC, Canada.*

The ability to accurately measure body or carcass composition is important for performance testing, requirement determination and carcass yield. The use of non-invasive procedures like dual-energy x-ray absorptiometry (DXA) is interesting over invasive procedure like dissection and chemical analysis. The objectives of the current study were to 1) validate the use of DXA (Discovery W; Hologic Inc., Waltham, MA, USA) in evaluating the body composition in fat (FatDXA), lean (LeanDXA), and bone mineral content (BMC), of broilers receiving different levels of dietary Ca, P, crude protein and energy, and 2) to develop prediction equations for each of these parameters according to the results obtained from the DXA scan. A total of 135 one-day-old male broilers (Cobb500) were distributed into 3 experimental treatments (3 pens/treatment, 45 birds/pen) and body weight was recorded weekly. Experimental treatments were designed to induce body composition variations which is necessary to have a robust equation. They consisted in a control diet that fulfilled all nutrient requirements with antibiotic growth factors, a diet without meat and bone meal and antibiotics, and a diet reduced in Ca, P and metabolizable energy. On d 7, 14, 21, 28 and 35 post-hatch, 3 birds per replicate were euthanized, frozen and then scanned in group of 3 using DXA with the rat whole body mode for the chicken at 7 and 14 d and the infant whole body for the 21, 28 and 35 animals. Broilers carcass were frozen and homogenized by grinding before chemical determination of lipid, protein, calcium (Ca) and phosphorus (P). Dry body lipids and protein ranged from 6 to 16% and from 12 to 20%, respectively. Total carcass fat (FatC), protein (ProtC), Ca (CaC) and P (PC) were predicted by regression analysis using measurements from DXA as an independent variable. Chemical data were all predicted with good accuracy: $\text{ProtC (g)} = -10.4 + 0.21 \text{ LeanDXA (g)}$, $R^2 = 0.97$; $\text{FatC (g)} = 11.4 + 0.49 \text{ FatDXA (g)}$, $R^2 = 0.95$; $\text{CaC (g)} = -0.218 + 0.38 \text{ BMC (g)}$, $R^2 = 0.96$; $\text{PC (g)} = -0.086 + 0.29 \text{ BMC (g)}$, $R^2 = 0.97$). These results indicate that DXA is a reliable method to predict body composition which has tremendous potential for the poultry industry with results that can be rapidly analyzed. It's also a valuable tool for monitoring bone mineralization.

Key Words: broiler, DXA, calcium, phosphorus, lean