IMPROVEMENT OF BONE QUALITY IN LAYING HENS AND BROILERS SUPPLEMENTED WITH ORGANIC SELENIUM

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Selenium (Se) is an essential trace element for humans and animals, and several findings suggest that dietary Se intake may be necessary for bone health in humans. The selection of high-performing breeds suffering from bone weakening in broilers and the risk for demineralization during the process of eggshell formation in laying hens raise the question of bone health and quality improvement. The objective of this study was to investigate the effect of supplementing organic Se to broilers and laying hens on bone quality, assessed by different parameters (tibia resistance and mineralization, measured by the content in tibia ash, calcium, phosphorus and Se). Laying hens (n = 24/group) and 2 consecutive batches of broilers (n = 10/group) were supplemented either with sodium selenite (SS: 0.2 ppm Se) or organic Se (ALKOSEL, SY: 0.2 ppm Se) over a basal diet containing 0.3 ppm Se from SS during 91, 32 and 14 days, respectively. In laying hens, tibia resistance (maximum force) and eggshell resistance (hardness work) were improved by 43% and 4%, respectively, with SY compared to SS (p < 0.1). In broilers, SY increased tibia resistance (stiffness: +20%, p = 0.05) and the content of tibia ash (+6%), calcium (+7%) and phosphorus (+7%) (p < 0.05) after 32 days of SY supplementation. Broilers supplemented during 14 days with SY had higher Se concentration in tibia (+24%, p = 0.003). These results highlight the interest of supplementing organic Se to improve bone resistance and mineralization in poultry in a context of increasing interest for animal welfare.

250 words