Sub-Chronic Ascorbic Acid Supplementation Accelerates Reduction of Liver Cadmium Levels in Broiler Chicken

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Abstract:
Environmental exposure to toxic heavy metals remains one of the main serious global health concerns. The objective of this study was to determine if daily supplementation with ascorbic acid for 4 weeks could lower chicken liver cadmium concentration after intentionally exposing hens to cadmium sulfate for 1 week. Normal mix-breed adult broiler chickens (N = 24) were used in this study. The baseline liver cadmium concentration was determined using a graphite furnace atomic absorption spectrophotometer. Each chicken then received 200 mg/kg/day cadmium sulfate and 500 mg/kg/day ascorbic acid mixed with water and feedstuff for 1 week and liver cadmium concentrations were determined. A group of chicken (n = 6) received 500 mg/kg/day ascorbic acid and another group (n = 6) did not receive ascorbic acid. The baseline liver cadmium level was 4.63 (± 0.41) mg/g. At the end of week 1, the liver cadmium concentration significantly increased to 60.9 (± 40.1) mg/g (p-value < 0.01). Daily supplementation with ascorbic acid for 4 week lowered the liver cadmium concentration to 20.2 (± 13.7) mg/g (p-value < 0.05). Supplementation with ascorbic acid could accelerate reduction of cadmium concentration in poultry liver after intentional exposure.