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L-Gulonolactone Oxidase Activity, Tissue Ascorbic Acid and Total Antioxidant Capacity in Vitamin A-Deficient Chickens, *Gallus gallus*

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Experiments were conducted to determine the effect of vitamin A deficiency in chicks on tissue ascorbic acid, plasma oxidant status and antioxidant capacity, and renal L-gulonolactone oxidase activity (GULO) in broiler chickens. Chicks were reared in battery cages and fed a practical diet with vitamin A (control) or the same diet without supplemental vitamin A from day-old to 23 or 30 days of age. The treatments were arranged in a randomized complete block design with 6-8 replications. At termination body weight, feed intake, and tissue weights were recorded and tissues analysed for ascorbic acid, GULO activity, antioxidant activity, and oxidant status. Growth, feed intake, relative weights of bursa of Fabricius, liver, spleen and testis were significantly reduced in vitamin A-deficient chicks. Vitamin A deficiency depressed renal GULO activity by 20% ($P < 0.08$) and 33% ($P < 0.007$) in Experiment 1 and 2 respectively. Bursal, hepatic, splenic, testicular, and plasma ascorbic acid concentrations, plasma total antioxidant activity, and plasma oxidant status were not altered by the decrease in GULO activity. However, plasma advanced oxidation protein products were lower ($P < 0.02$) in vitamin A-deficient chickens. The lack of effect on tissue ascorbic acid and antioxidant capacity suggest that metabolic changes associated with vitamin A deficiency may reduce ascorbic acid excretion. The reduction in plasma advanced oxidation protein products may be ascribed to lower metabolic activity because of hypothyroidism in vitamin A-deficient chicks. In conclusion, short-term vitamin

A deficiency in broiler chicks reduced GULO activity without concomittant changes in tissue ascorbic acid.

Keywords: [chicken](#), [L-gulonolactone oxidase activity](#), [vitamin A](#), [vitamin C](#)

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