

Thanida Srihawong 2007: The Effects of Crude Extracts from *Curcuma longa* and *Andrographis paniculata* on Oxidative Stress and Lipid Peroxidation in Broilers. Master of Science (Animal Physiology), Major Field: Animal Physiology, Department of Physiology. Thesis Advisor: Assistant Professor Chanin Tirawattanawanich, Ph.D. 103 pages.

One of the crucial health problems of broilers reared under intensive farming system is stress, particularly the chronic one that affects cellular redox balance rendering the cells to oxidative stress, DNA damage, lipid peroxidation, and apoptosis. In attempt to reduce such damages and loss in poultry industry, a possible role of crude extracts of *Curcuma longa* and *Andrographis paniculata* in minimizing the oxidative stress and lipid peroxidation was examined. Two hundred day-old broiler chicks were divided into 4 groups receiving basal diet with 1 of the 4 different supplements; N: no supplement; P: 3 mg/kg prednisolone; CP: 3 mg/kg prednisolone and 0.05% *Curcuma longa*; AP: 3 mg/kg prednisolone and 0.1% *Andrographis paniculata*. At 14, 21 and 28 days of age, 12 broilers from each group were randomly selected for examinations of 1) heterophil to lymphocyte ratios as a stress index, 2) total antioxidant capacity (TAC), using ferric reducing ability of plasma, 3) reduced glutathione to oxidized glutathione (GSH/GSSG Ratios) and 4) plasma malondialdehyde (MDA) as the oxidative stress and lipid peroxidation index.

Result showed that the birds P group expressed a significantly higher stress level than those in N group ( $P < .05$ ) at 14 days of age, suggesting that 3 mg/kg prednisolone could successfully induce stress. Such effect however was not found in CP and AP group. This might suggest that the herb supplements could have beneficial effect in stress control in broilers. At day 14, the TAC of the birds in AP group was found higher than those in N group ( $P < .05$ ). The higher TAC was also detected at day 28 in CP group and AP group compared to N and P group ( $P < .05$ ). At day 14, the GSH/GSSG Ratios of the birds in P group was found lower than those in group AP, N and CP group ( $P < .05$ ) while at day 21 and 28, the significance was found when compared to N and CP group ( $P < .05$ ) but not AP group. When compared to plasma MDA of the birds in P group, the significance lower levels were found in CP group at days 14, 21 and 28 ( $P < .05$ ). Such significance was found as well extended to N and AP group at day 28 ( $P < .05$ ). It could be suggested that stress induced by prednisolone negatively affected the antioxidant capacity particularly that associated with glutathione antioxidant system thereby rendering broilers to oxidative stress and lipid peroxidation. From these finding, some potential roles of crude extracts of *Curcuma longa* and *Andrographis paniculata* in stress control and redox homeostasis in broilers could also be suggested.

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Thesis Advisor's signature