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Effects of a pro-oxidant dietary supplement on cell-mediated immunity in broilers

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Dietary components can impact on the immune response effectiveness by several mechanisms. Nevertheless, different authors questioned the opportunity of the antioxidant supplementation as a protective major against free radical (FR) production and suggested that this may have a negative influence on the immunological functions, while others pointed out the protecting effect of antioxidants on lymphocyte cells against oxidative stress^(1,2). The aim of this study was to investigate the effects of a pro-oxidant on the *in vitro* immune reactivity of broilers. The research was carried out on a total of 40 broilers divided into two experimental groups (A and B). In group B, sunflower oil oxidised by maintaining it at 110°C for 48 h as was supplemented in the basal diet as a pro-oxidative factor. The lipid oxidation level in sunflower oil, breast and thigh muscles and liver of broilers was established by measuring thiobarbituric acid reactive substances (TBARS). The impact on cell-mediated immunity was evaluated by determining the blood lymphocyte proliferation and the phagocyte activity. The blast transformation test assessed the lymphocytes proliferation intensity (stimulation indices, %) were calculated after a 48 h contact with standard mitogens such as phytohaemagglutinin (PHA), lipopolysaccharide (LPS) and Concanavalin A (Con A) and also with sage (*Salvia officinalis*) alcoholic extracts well known for its antioxidant potential⁽³⁾. Also, the *in vitro* carbon clearance assay was performed to observe the phagocytes activity, expressed as the negative of the optical density slope over time (ln), during three time moments (0, 15 and 30); for each experimental group, 4 variants were tested (control and alcohol, *Rosmarinus officinalis* and *S. officinalis* treated).

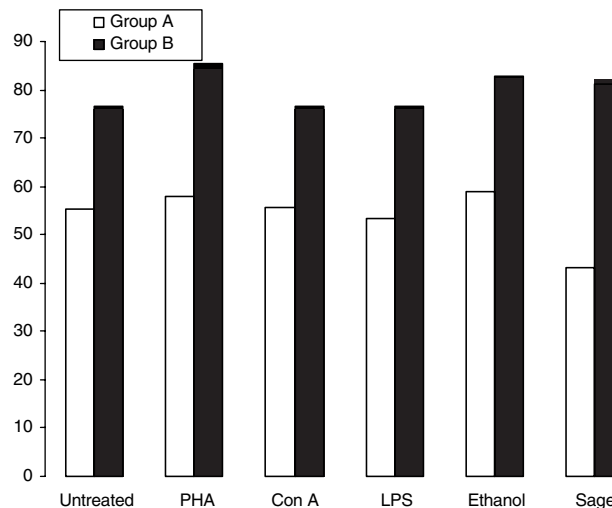


Fig. 1. Lymphocytes proliferation intensity (means of stimulation indices).

The results of blast transformation test indicated higher lymphocytes reactivity for group B when compared to group A (Fig. 1). Similar aspects were observed in the phagocyte activity, although this increase cannot be considered significant ($P > 0.05$).

These data suggest that the pro-oxidant supplementation along with the increasing effect on lipid peroxidation, augmented the lymphocytes and phagocytes reactivity, modulating both specific and non-specific cell-mediated immunity in broilers.

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