

## Immunosuppressive Effects of Benzo (a) Pyrene on Newcastle Disease Vaccination in Broilers

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### Abstract

Newcastle disease (ND) vaccination was used as a model in assessing the role of benzo(a)pyrene (BaP) in inducing immunosuppression. Forty day-old chicks were divided into a control and BaP group comprising of 20 birds each. The control group was instilled with tricapylin alone while that of BaP received 15 mg BaP/kg intratracheally for 5 consecutive days. Live ND vaccine was given on Day 7 and repeated again on Day 21 to all chickens. Prior to post mortem, blood was collected from five chickens from each group at Days 0, 7, 14, 21 and 35 for determination of HI titer. At necropsy, liver and lung samples were procured for the determination of glutathione transferase (GST), glutathione peroxidase (GPx) and malionaldehyde (MDA) activities. The BaP group gained a slower immune protective level compared to that of the control (21 versus 7 days). The hepatic and pulmonary GST activity and MDA level of the BaP group demonstrated an increment until Day 14 p.i. which then tapered towards the end of study. However, the GP<sub>x</sub> activity was only invoked towards that later stage of the experiment. Likewise, it was also shown that the GST and GP<sub>x</sub> activities were negatively correlated. Thus, this study unveiled that the metabolism of intra-tracheally instilled BaP brings about systemic oxidative stress which induces immunosuppression in broilers.

**Keywords:** broiler, ND titer, GST, GP<sub>x</sub>, MDA level