

## EFFECTS OF *p*-NONYLPHENOL ON THE IMMUNE ORGANS IN THE JAPANESE QUAIL

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We attempted to observe the effects of *p*-nonylphenol (NP) on the immune organs such as the bursa of Fabricius, spleen and thymus in male Japanese quail. Three doses of NP (10, 100, 1000 ng/g body weight) were injected intraperitoneally every 2 days. Control birds were injected an equal volume (200  $\mu$  l) of peanut oil similarly. The birds were kept in short photoperiod (8L16D) from 4 weeks to 7 weeks after hatching. As the result, the bursa weight and body weight were dose dependently suppressed by NP administration. In the bursa, lymphoid follicles increased in 10 ng/g body weight NP treated birds, lobules became small and the number of lobules in all NP-treated groups decreased. However, the empty spaces found in the bursa of estradiol treated quail (Razia *et al.*) were not induced by NP treatment. Spleen and thymus weights did not show significant differences among groups, while the empty spaces were found in the thymus.