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Efficacy of curcumin in ameliorating the toxic effects of ochratoxin A and aflatoxin in young broilers

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Two experiments (hatch to 21 days) were conducted to evaluate the efficacy of curcumin to ameliorate the toxic effects of aflatoxin (AF; Exp.1) and ochratoxin A (OA; Exp. 2). Food grade turmeric powder (Curcuma longa) containing 2.55% (Exp. 1) and 1.90% (Exp. 2) total curcuminoids (TCMN) was the source of curcumin. In Exp. 1, six pen replicates of 5 chicks each were assigned to each of 6 dietary treatments: A) basal diet with no TCMN or AF (BD); B) BD plus 444 mg/kg TCMN;C) BD plus 1.0 mg/kg AF; D) BD plus 74 mg/kg TCMN and 1.0 mg/kg AF;E) BD plus 222 mg/kg TCMN and 1.0 mg/kg AF; and F) BD plus 444 mg/kg TCMN and 1.0 mg/kg AF. Compared with controls, the addition of 1 mg/kg AF to the basal diet decreased ($P < 0.05$) feed intake (FI) and weight gain (WG). The addition of 74 and 222 mg/kg TCMN to the AF diet improved ($P < 0.05$) WG. In Exp. 2, five pen replicates of 5 chicks each were assigned to each of 5 dietary treatments: A) basal diet with no TCMN or OA (BD); B) BD plus 2.5 mg OA/kg diet; C) BD plus 2.5 mg OA/kg and 75 mg/kg TCMN; D) BD plus 2.5 mg OA/kg and 150 mg/kg TCMN; and E) BD plus 2.5 mg OA/kg diet and 225 mg/kg TCMN. Compared to controls, chicks fed OA had reduced ($P < 0.001$) feed FI and WG. The addition of up to 225 mg/kg to the OA diet was not effective in preventing the toxic effects of OA. Addition of 222 mg/kg TCMN to the AF diet was partially effective in protecting chicks from the toxic effects of AF, but 225 mg/kg TCMN was not effective in protecting chicks from the toxic effects of OA.