Excess dietary tryptophan mitigates aflatoxicosis in growing quails

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Background: Xenobiotic aflatoxins are harmful to health of human that could be inactivated with nutritional manipulation without side effects of different methods to detoxify of aflatoxins, especially aflatoxin B1 (AFB).

Results: The decline in feed intake, BW gain, and Gain:Feed (G:F) in birds fed 5.0 mg kg⁻¹ AFB1-D with 2.9 g TRP/kg of diet was restored to the control levels by excess-TRP. Hepatic enzymes were increased in quails fed on AFB1-D but attenuated by excess-TRP (P < 0.01). High serum uric acid in birds challenged with AFB1 was decreased by excess-TRP (P < 0.01). The suppressed skin thickness to 2,4-dinitro-1-chlorobenzene challenge caused by AFB1 was increased by excess-TRP in an interactive manner (P < 0.02). AFB1 increased the production of malondialdehyde (MDA) in meat samples whereas dietary TRP efficiently diminished MDA production (P < 0.01). The highest drip loss and pH were observed in birds fed 5.0 mg kg⁻¹ AFB1-D but increasing dietary TRP augmented the adverse effects of AFB1 synergistically (P < 0.01). The main effect of TRP was significant on reducing total microbial and Escherichia coli counts (P < 0.01). An adverse effect of AFB1 on reducing Lactic acid bacteria in the small intestine was completely excluded by increasing dietary TRP (P < 0.03).

Conclusion: Tryptophan supplement could be an efficient nutritional tool to ameliorate the adverse effects of AFB1 in growing quails; and growth performance and immunity responses of intoxicated birds at higher dietary TRP than that recommended by standard nutritional tables could be improved.

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