

Effects of Mycotoxins in Cereal-Based Feed on Animal Health and Food Safety

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Outline

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Abstract

Mycotoxins are common natural contaminants in crops and animal feed, posing potential risks to both human and animal health. Although regulatory guidelines are usually based on single-mycotoxin exposure, in practice, multiple mycotoxins often co-occur in feed ingredients and complete diets. To evaluate such risks, several studies have investigated their prevalence and impact across different regions and animal species. In the southeastern United States, analysis of corn samples by HPLC-MS/MS revealed frequent co-contamination with fumonisins, deoxynivalenol(DON), aflatoxin B1(AFB1), and zearalenone(ZEA), which was also correlated with alterations in corn nutritional composition. Similarly, monitoring of feed for poultry and pigs in southern Romania showed that six major mycotoxins were consistently present. These findings highlight that subchronic or chronic low-dose co-exposures are more common than acute intoxications, leading to compromised immunity, inflammatory responses, and gut health, with significant economic implications. Furthermore, an animal feeding trial in laying hens demonstrated that moldy corn reduced average daily feed intake and egg production, induced oxidative stress and immunosuppression, impaired lipid metabolism and liver function, and resulted in detectable residues of AFB1 and ZEA in eggs, muscle, and edible viscera. they still indicate a potential food safety concern. Collectively, these studies confirm that mycotoxin co-contamination is a prevalent condition in feed and feed ingredients, adversely affecting nutritional quality, animal health, and food safety. Continuous monitoring and further investigation of mycotoxin interactions are essential to safeguard livestock productivity and ensure feed and food safety.

Reference

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