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A review of the mycotoxin adsorbing agents, with an emphasis on their multi-binding capacity, for animal feed decontamination

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Abstract

Contamination of animal feed with mycotoxins still occurs very often, despite great efforts in preventing it. Animal feeds are contaminated, at low levels, with several mycotoxins, particularly with those produced by *Aspergillus* and *Fusarium* genera (Aflatoxin B₁, Ochratoxin A, Zearalenone, Deoxynivalenol and Fumonisin B₁). In animal feed, to date, only Aflatoxin B₁ is limited through EU regulation. Consequently, mycotoxins cause serious disorders and diseases in farm animals. In 2009, the European Union (386/2009/EC) approved the use of mycotoxin-detoxifying agents, as feed additives, to prevent mycotoxicoses in farm animals. The present review gives an overview of the problem of multi-mycotoxin contamination of feed, and aims to classify mycotoxin adsorbing agents (minerals, organic, and synthetic) for feed decontamination, focusing on adsorbents with the ability to bind to multiple mycotoxins, which should have a more effective application in farms but they are still little studied in scientific literature.

Keywords: mycotoxins, animal feed, adsorbents, multi-binding, decontamination

Abbreviations:

15-acetyldeoxynivalenol (15-Ac-DON), 3-acetyldeoxynivalenol (3-Ac-DON), Activated Carbon (AC), Adsorbing Agents (AA), Aflatoxin (AF), Aflatoxin B₁ (AFB₁), Aflatoxin B₂ (AFB₂), Aflatoxin M₁ (AFM₁), Aflatoxins (AFs), Alternariol (AOH), Biotransforming Agents (BA), Body Weight (BW), Deoxynivalenol (DON), Ergot Alkaloids (EAs), Esterified Glucomannans (EGM), European Commission (EC), European Food Safety Authority (EFSA), European Union (EU), FAO (Food and Agriculture Organization of the United Nations), Feed Intake (FI), Fumonisin B₁ (FB₁), Fumonisin B₂ (FB₂), Fumonisin (FBs), Fusaric Acid (FA), Gastrointestinal (GI), Good Agricultural Practices (GAP), Glucomannans (GM), Hydrated Sodium Calcium Aluminosilicate (HSCAS), International Agency for Research on Cancer (IARC), Maximum Permitted Levels (MPLs), Molecular Weight (MW), Nivalenol (NIV), Ochratoxin A (OTA), Yeast Cell Wall (YCW), Weight Gain (WG), Zearalenone (ZEN).

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