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Prevention of Mycotoxin Contamination Risk in the Feed Chain through GHP and HACCP

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Mycotoxin contamination remains one of the most persistent and relevant safety challenges within the feed chain, with significant implications for animal health, the quality of animal-derived products, and, indirectly, public health. Mycotoxins are toxic secondary metabolites produced by filamentous fungi such as Aspergillus, Fusarium, and Penicillium, which can contaminate plant raw materials and compound feeds at various stages of the production process, particularly during the post-harvest phase. This paper analyses strategies for preventing mycotoxin contamination in the feed chain, focusing on the application of Good Hygienic Practices (GHP) and the HACCP (Hazard Analysis and Critical Control Points) system. Good practice guidelines provide an operational framework for hygiene, handling, storage, and transport, contributing to limiting the factors favoring the development of toxigenic fungi. In parallel, the HACCP system introduces a structured and preventive approach based on hazard identification and monitoring of critical control points (CCPs), tailored to the specific context of each facility or operation. The paper also explores the synergy between the two approaches - GHP and HACCP - and their efficiency in managing the risks associated with mycotoxin contamination, especially in the current context marked by climate change and strict food safety standards. Through an integrated approach, safe feed, animal health, and the confidence of the final consumer can be ensured.

Mycotoxin Contamination in the Feed Chain – Sources and Risk Factors



Mycotoxins are toxic metabolites produced by fungi such as Aspergillus, Fusarium and Penicillium, representing a major threat to animal health and human food safety. Mycotoxin contamination significantly affects feed globally, with studies indicating that over 70% of samples contain at least one toxin, often in multiple combinations. These contaminations can occur at all stages of the feed chain – from agricultural crops to storage and processing – and are aggravated by factors such as climate change and certain intensive agricultural practices. Incidents such as "Turkey X disease" or the detection of aflatoxin M_1 in raw milk highlight the direct risks to public health. In this context, effective prevention requires an integrated and proactive approach. Safety systems based on Good Hygiene Practices (GHP) and the analysis of critical control points (HACCP) provide a coherent framework for action, aiming to reduce the risk of contamination through structural measures, monitoring and control at source. This paper explores the application of these two tools in the feed sector and their strategic relevance in the current agricultural and climatic context.



HACCP System and Critical Control of Mycotoxins

1. Hazard Analysis – Identification of relevant mycotoxins (e.g., aflatoxin B_1 , DON, fumonisins) at each stage of the process.

2. Determination of Critical Control Points (CCPs) – Establishing stages where control is essential to prevent or eliminate mycotoxin contamination.

3. Establishment of Critical Limits – Defining acceptable values for each CCP (e.g., aflatoxin $B_1 < 20 \ \mu g/kg$).

4. Monitoring of CCPs – Implementing monitoring procedures (e.g., rapid ELISA tests, measurements of moisture and temperature).

5. Corrective Actions – Defining remedial actions in case of exceeding critical limits (e.g., rejection of contaminated batch, drying of cereals).

6. Verification of System Effectiveness – Performing audits and periodic analyses to confirm that the system is working correctly.

7. Documentation and Record Keeping – Maintaining detailed records of all procedures, monitoring activities, and corrective actions.





Reduced mycotoxin levels. Fewer non-conformities. Industry cases confirm better outcomes when both systems are combined.

The integrated application of GHP and HACCP offers a robust defense against mycotoxin contamination in the feed chain. This dual approach not only reduces the risk of contamination but also improves operational efficiency, ensuring safer feed for animals and safer food for consumers. As the feed industry adapts to emerging challenges, continuous improvement and innovation in these systems will be key to maintaining high standards of safety and

