Mycotoxin Detection in Maize, Commercial Feed, and Raw Dairy Milk Samples from Assiut City, Egypt

Mohamed F. Abdallah, Gözde Girgin and Terken Baydar

Abstract:

This survey was conducted to investigate the contamination by multiple mycotoxins, aflatoxins (AFB1, AFB2, AFG1, and AFG2), ochratoxin A (OTA), and zearalenone (ZEA) in 61 samples of maize and 17 commercial animal feed samples, and of aflatoxin M1 (AFM1) in raw dairy milk samples (n = 20) collected from Assiut City in Upper Egypt. Multi-mycotoxin immunoaffinity columns were used for samples cleanup and mycotoxin purification. An HPLC–FLD system with an on-line post-column photochemical derivatization was used for the detection of the target toxins. AFB1 was detected in both maize (n = 15) and feed (n = 8), with only one maize sample presenting a concentration above the maximum permissible level set by the Egyptian authorities. AFB2 was observed in six maize samples and in one feed sample, with a maximum value of 0.5 μg/kg. ZEA was detected only in feed samples (n = 4), with a maximum value of 3.5 μg/kg, while OTA, AFG1, and AFG2 were under the limits of detection. For milk, all the analyzed samples (100%) were contaminated with AFM1, and 14 samples (70%) presented concentrations above the maximum permissible level in the European Union (EU) (0.05 μg/kg). The concentrations ranged from 0.02 μg/kg to 0.19 μg/kg, except that of one sample, which was under the limit of quantification. The contamination rates in maize and animal feeds are not alarming. In contrast, the consumption of dairy milk samples in Assiut City may pose public health hazards, as AFM1 levels were found to exceed the international permissible limits. Further surveys are highly recommended in order to establish a database for mycotoxin occurrence in Egypt to minimize the possible health risks in animals and humans.

Keywords:

mycotoxins; maize; raw milk; aflatoxins; ochratoxin a; zearalenone; HPLC; Egypt

Published In:

Veterinary sciences, NULL, NULL