Research project IZSVe 11/14

Simple, innovative, fast and ultra fast methods for semiquantitative screening and quantitative confirmatory analyses of mycotoxins in feed

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Mycotoxins represent a wide group of natural chemical contaminants produced by the secondary metabolism of fungi, like Fusarium, Aspergillus, and Penicillium genera that may infest various food crops including cereals such as wheat, maize and barley.

Due to their relatively stable structure, mycotoxins can be found also in final processed foods.

Moreover for future, we have to consider the impact of climate change, that have been identified as an emerging issue by the Food and Feed Safety EFSA's Emerging Risks Unit. The changing patterns in mycotoxin contamination in cereals, due to climate change will most probably be a potential emerging hazard. In particular, aflatoxins (AFs) which are frequent in tropical and sub-tropical areas may become of concern in the EU.

The usual ELISA screening test combined to classical HPLC confirmation methods show some limitations in terms of number detectable analytes, sample throughput, response time and false positives rate.

Part of the project will be devoted to a correct identification of samples to be analysed, in collaboration with producers, retailers and breeders.

The project is therefore aimed at the development and validation of parallel and independent methods moving from unique preparation protocol and analysed by different apparatus:

- for screening purposes the semiquantitative determination of the contamination will be performed by a novel really promising Direct Analysis in Real Time (DART)-HRMS system
- for quantification and confirmation, analyses will be based on a multi-mycotoxins HPLC/MSMS methods

Moreover an untargeted approach for the identification of potential marker of stress in plants will be tempted.