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Development of multi-target UPLC-MS/MS analytical method aimed for determination of new and emerging mycotoxins in feed

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Abstract Natural occurrence of various fungi species is not possible to avoid under the ordinary conditions, thus their secondary metabolites, mycotoxins, represent an ubiquitous and common contaminants of wide range of agricultural commodities under the appropriate field and/or storage conditions. The syndromes resulting from the ingestion of these toxic compounds are generally called mycotoxicoses. Depending on type of mycotoxins, some of them can be modified within the mammal metabolism by means of which their toxicity can be decreased. To the most common mycotoxins, which can be found in various kinds of feed, belong fusariotoxins, fumonisins, enniatins, aflatoxins, ochratoxin, alternaria-toxins, ergot alkaloids and others.



Within presented study, fast, reliable and sensitive analytical method employing UPLC-MS/MS instrumentation (QTRAP 5500, AB SCIEX system) has been optimized and validated. At present it is possible to quantitate more than 40 target mycotoxins in cereal-based feed samples. For an efficient extraction, QuEChERS-based strategy was used. The recoveries for all of the tested mycotoxins were between 75% and 98% and LOQs as low as 0.5 µg/kg could have been obtained for most of the analytes. By means of this analytical method, a set of cereal-based feeding stuffs collected from UK farms were analysed for mycotoxins contamination. Main representatives of *Fusarium* mycotoxins, such as deoxynivalenol, fumonisins and/or zearalenon, were detected in the tested feed samples. In addition to these common mycotoxins, also new 'emerging' mycotoxins, enniatins and beauvericin, were detected. However, the levels of most of them were not exceeding 100 µg/kg. The highest concentration of target analytes was detected for enniatin B at a level close to 1800 µg/kg. Obtained results clearly showed that further detection of mycotoxins in feed commodities is of the most importance and highly needed.

Keywords mycotoxins; multi-target screening; feed; QuEChERS; UPLC-MS/MS

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