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SIMULTANEOUS DETERMINATION OF ZEARALENONE, DEOXYNIVALENOL AND THEIR METABOLITES IN PHYSIOLOGICAL SAMPLES WITH LC-MS/MS

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Purpose

The mycotoxins zearalenone (ZEN) and deoxynivalenol (DON) are of special importance in animal nutrition due to the frequent contamination of cereal grains and their toxic effects especially on pigs. The aim of this study was to develop a selective and sensitive LC-MS/MS method combined with an economic sample preparation for the determination of ZEN, DON and their metabolites in animal specimens which can be used for diagnosis of intoxications of farm animals.

Methods

Samples were incubated with β-glucuronidase over night before cleaning up with solid phase extraction (Oasis HLB, Waters). ZEN, DON and their metabolites α-zearalenol, β-zearalenol, zearalanone, α-zearalanol, β-zearalanol and de-epoxy-DON were eluted with methanol and evaporated to dryness. After resuspension in methanol/water (70/30 v/v) samples were analysed with LC-MS/MS using gradient elution.

Results

A new LC-MS/MS method including an economic sample preparation method was developed and successfully validated for pig serum, but can also be used for different physiological samples. The application for plasma, liquor, urine and follicular fluid is possible with slight modifications of the given method. The recoveries were in the range of 60-110%. The limit of detection was estimated being 0.03-0.8 ng/ml.

Conclusion

The developed method can be used as a multi-biomarker method to assess animal exposure to these mycotoxins. Also, it will be applied for the obtained samples from different feeding trials with practically relevant ZEN and DON concentrations. The applicability to other matrices such as bile, milk etc. is in progress.

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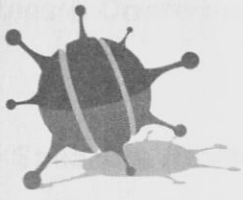

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