CAPSULES
preliminary notes and applications from Bioanalytical Systems, Inc.

Determination Of Vomitoxin (deoxynivalenol)

Purpose
Determination of deoxynivalenol from fungal cultures on grain.

Vomitoxin (deoxynivalenol, DON, F1) is a trichothecene mycotoxin produced by Fusarium pathogens of grain. Contamination of grain causes emesis and feed refusal in swine and is thus a significant problem in the livestock industry. Moreover, there are reports that high levels of DON are carcinogenic in humans. A rapid and sensitive analysis is needed for screening grain samples.

Existing Methods
GC-MS, which is time consuming and labor intensive; TLC which is not sensitive, and LCUV at wavelengths below 227 nm.

Reference
Determination of Deoxynivalenol (vomitoxin) by High-Performance Liquid Chromatography with Electrochemical Detection, V.L. Sylvia, T.D. Phillips, B.A. Clement, J.L. Green, L.F. Kubena and N.D. Heidelbaugh, J. Chromatogr. 362(1986) 79-85.

Conditions
Detector: BAS LC 4B/17
Electrode: BAS glassy carbon
Potential: -1.4 V vs Ag/AgCl
Column: 10 µm, C 18, reverse-phase with radial compression, and a C 18 guard column
Mobile Phase: Methanol: 40 mM borate buffer in 0.10 M acetic acid, pH 7.0, 35:65 deoxygenated at 100°C with N_2.
Detection Limit: 250 pg of standard DON
Linear Range: linear up to 1 µg

Sample Preparation
Cultures of Fusarium on grain were extracted with methanol:water (40:60). The extract was filtered and 10-100 µL were injected.

Notes
Electrochemical detection allowed a 12-fold increase in sensitivity compared with UV detection at 224 nm (F2).

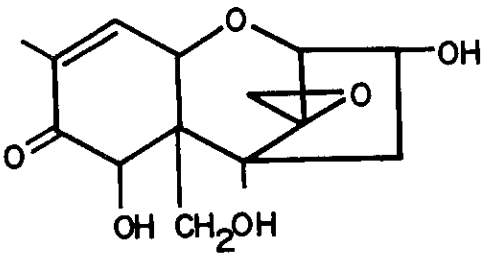

Figure 1. Structure of DON.

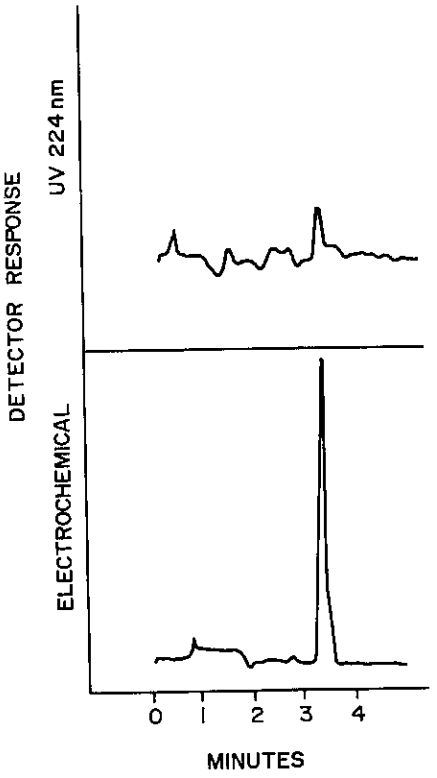

Figure 2. Chromatogram of DON from contaminated wheat culture. Above: UV detection, 0.001 AUFS. Below: EC detection, 10 nAFS.

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Changing the extraction solvent to acetonitrile:water (90:10) will increase extraction efficiency to about 98%.

The determination of vomitoxin presented in this report can be duplicated using the BAS 200 Problem Solver, which has a built-in deoxygenation system.

The information in this publication is supplied as a service to our customers. Performance of the methodology has not necessarily been verified by BAS technical staff.