

MYCOTOXINS

IN VIVO TOXICITY TO RATS OF FRIED AND BAKED CORNMEAL CONTAINING FUMONISINS (K. A. Voss, F. I. Meredith, and C. W. Bacon)

Fusarium verticilloides produces fumonisins and these mycotoxins are found in corn and corn-based foods. While cooking may decrease fumonisin concentrations, little is known how cooking affects biological activity of the mycotoxins. Hence, baked cornbread, pan-fried cornmeal, and deep fried fritters were made from cornmeal that was spiked with 5% w/w *F. verticilloides* culture material (CM) and fed to male rats (n = 5/group) for 2 weeks at high (20% w/w spiked cornmeal equivalents) or low (2% w/w spiked cornmeal equivalents) doses. Although fumonisin concentrations, as determined by HPLC analysis, decreased slightly upon cooking, this reduction was not statistically significant. Concentrations in the pan-fried corncake, baked cornbread, deep-fried fritter, and uncooked CM-spiked cornmeal diets were 92.2, 132.2, 120.2, and 130.5 ppm fumonisin B₁, respectively. Toxic response to the uncooked CM-spiked cornmeal and the cooked products included decreased body weight gain (high-doses only), decreased kidney weight, and microscopic kidney and liver lesions of the type caused by fumonisins. It was concluded that baking and frying had no significant effect on the biological activity or concentration of fumonisins in these corn-based products and hence, there was no evidence for the formation of novel toxins or "hidden" fumonisins during cooking.

DYNAMICS OF FUMONISIN RETENTION IN SOIL MICROCOSMS

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Fumonisin B₁ (FB1), a water-soluble mycotoxin produced by *Fusarium verticilloides*, was applied to soils to assess its movement through that medium. FB1-containing corn screenings or water extracts containing FB1 were placed on the surface of soil columns containing varying levels of sand or Cecil sandy loam. In 100% sand columns, FB1 leaching was only slightly retarded, whereas at 50%, 75%, and 100% Cecil sandy loam, approximately 60%, 50%, and 20% of the FB1 was recovered in the column leachate, respectively. FB1 was tightly bound to 100% Cecil sandy loam but approximately 75% of the bound FB1 could be released by 5% formic acid and 5% formic acid:acetonitrile (1:1), indicating that ionic interactions predominated. The results suggest that FB1 is tightly bound in soils but under certain environmental conditions could be released.