International Conference on the Toxicology of Fumonisin: Introduction

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— *Environ Health Perspect* 109(suppl 2):237 (2001).
http://ehpnet1.niehs.nih.gov/docs/2001/suppl-2/237allaben/abstract.html

The international conference "The Toxicology of Fumonisin" was held 28–30 June 1999 in Arlington, Virginia. The conference was sponsored by the U.S. Food and Drug Administration (FDA), the National Institute of Environmental Health Sciences, the U.S. Department of Agriculture, and the Technical Committee on Food Toxicology and Safety Assessment, which is part of the International Life Sciences Institute North America. The purpose of the conference was to assemble, present, and critically review the available data on the chemistry, toxicities, and mechanisms of action of the fumonisin mycotoxins; to provide a forum for presentation of the National Toxicology Program bioassay on fumonisin B_1; to identify critical data gaps and research needs; and to identify factors affecting the occurrence of fumonisin and tools for fumonisin management and control.

The conference began with an address by W. Marasas, one of the investigators who first identified the *Fusarium* mycotoxins and linked exposure to these materials with high rates of human esophageal cancers in South Africa. Marasas reviewed these studies and explored the history of episodic poisonings worldwide, including the outbreaks associated with the consumption of moldy corn by livestock in the United States in 1989 and 1990. The chemistry of the *Fusarium* mycotoxins, including their biosynthesis, was then reviewed. Known toxicities of fumonisins and *Fusarium* toxins in horses, pigs, rats, and nonhuman primates were covered, followed by a session outlining the National Toxicology Program's bioassay results, which were positive for rat kidney and mouse liver. Fumonisin B_1 is a powerful inducer of apoptosis in certain organs and this action has been linked to specific inhibition of ceramide synthase, resulting in altered sphingolipid metabolism. This pathway, as well as several other proposed mechanisms of carcinogenesis, was then covered in depth. The conference concluded with a session devoted to examining the conditions that favor mycotoxin growth in corn and a number of strategies currently under development to prevent further outbreaks.

On 6 June 2000 the FDA released a draft guidance document, "Guidance for Industry—Fumonisin Levels in Human Foods and Animal Feeds" (*1*). The document stated that, on the basis of available information on the adverse animal health effects associated with fumonisins, human health risks associated with exposure to fumonisins are possible. The guidance document also stated that human exposure to such natural toxins should not exceed certain levels achievable with the use of good agricultural and good manufacturing practices. FDA's guidance document notes that the maximum levels for fumonisins in corn and corn products intended for human consumption are based on concerns associated with hazards shown primarily by animal studies, including the comprehensive toxicology studies conducted at FDA's National Center for Toxicological Research that were supported by the National Institute of Environmental Health Sciences/National Toxicology Program (*2*).

References and Notes

1. U. S. FDA. Guidance for Industry on Fumonisin Levels in Human Foods and Animal Feeds. Dockets Management Branch (HFA-305). Rockville, MD:U.S. Food and Drug Administration.
2. FDA–NIEHS. For the Conduct of Comprehensive Toxicological Assessments. Interagency Agreement No. 224-93-0001. U.S. Food and Drug Administration–National Institute of Environmental Health Sciences, 1991.