

MICROBIOLOGICAL TOXINS

COMPARING THE REPRODUCTIVE TOXICITY OF FUMONISIN B₁ (FB₁) AND HYDROLYZED FUMONISIN B₁ (HFB₁): ONLY FB₁ INDUCED NEURAL TUBE DEFECTS IN LM/BC MICE (K.A. Voss, T.D. Burns, M.E. Snook, R.T. Riley, J.B. Gelineau-van Waes)

Fumonisin B₁ (FB₁) is a mycotoxin that is found in corn-based foods. It is hydrolyzed under alkaline conditions such as those of the cooking process known as nixtamalization. Hydrolyzed fumonisins have been found in corn tortillas and evidence suggests that the consumption of tortillas containing fumonisins was a contributing factor in an enigmatic cluster of neural tube defects in southern Texas during 1990-91. Fumonisin B₁ (FB₁), the most common fumonisin, causes neural tube defects when given to mice at a critical time period during pregnancy. The ability of hydrolyzed fumonisin B₁ (HFB₁) to cause neural tube defects was tested by administering it by intraperitoneal injection (ip) at doses of up to 20 mg/kg ($\leq 49 \mu\text{mol/kg}$) body weight to pregnant mice of the LM/Bc strain, a sensitive *in vivo* model for FB₁-induced neural tube defects. Another group was given 10 mg/kg body weight ($=14 \mu\text{mol/kg}$ ip) FB₁ and a control group was treated with vehicle only. NTDs were found in all litters from FB₁-exposed dams. Decreased numbers of fetuses/litter, decreased litter weights and increased fetal deaths were also found in the FB₁-treated group. In contrast, no neural tube defects or other indications of fetal toxicity were found in the control group or any group treated with HFB₁. Because the highest HFB₁ dose was about 3.5 fold greater ($\mu\text{mol/kg}$ basis) than the FB₁ dose, these results indicate that HFB₁ is a significantly less potent reproductive toxin in the LM/Bc mouse model. Additional studies are needed to determine if a lowest observed adverse effect level for HFB₁-induced neural tube defects can be established.

