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The effects of oral fumonisin B1 exposure on the renal and hepatic lipid metabolism

Omeralfaroug Ali
University of Kaposvár, Hungary

Co- Authors
András Szabó[1], Judit Szabó-Fodor[1], Hedvig Fébel[2], Miklós Mézes[3], Melinda Kovács[1]
[1]Kaposvár University, Hungary
[2]National Agricultural Research Center, Hungary
[3]Szent István University, Hungary

Due to the structural similarity between fumonisin B1 (FB1) and sphingolipids (essential substances for membrane composition), FB1 is able to disturb the sphingolipid metabolism. The aim of this study was to test the effects of oral administration of FB1 on the total fatty acid (FA) profile of phospholipids (PL) and triglycerides (TG) of weaned piglets. The 10 days *in vivo* experiment was performed on 14 animals (seven/group): control (FREE) and orally intoxicated (TOXIN) by 20 mg FB1/kg diet. Statistical differences were analyzed by SPSS using independent samples t-test with p-value < 0.1 as a level of significance. From results, the decrease in proportions of many saturated fatty acids (SFA) (C24:0 was the most apparent alteration) was a consequence of FB1 administration, as the total SFA of the kidney PL was low in TOXIN. Despite the decrement in proportions of omega-3 (ω-3) FAs (C22:6n3 was the most responsive FA), the total unsaturation (UFA) was high due to an increment in proportions of omega-6 (ω-6) FAs (C20:4n6 was the most responsive FA). Thus, has altered the overall ω-6: ω-3 ratio (increased), most clearly in the liver PL. However, total proportions of ω-6 and ω-3 of TG were not affected by the FB1 exposure but some of their classes were influenced. To assess the oxidative load, the MDA was measured. Interestingly, the MDA concentration was high in the liver of TOXIN. Thus, the liver was characterized by undergoing oxidative stress due to the FB1 exposure. It can be concluded that the 20 mg FB1/kg diet orally exposure for 10 days has altered the renal and hepatic lipid metabolism of piglets, especially the hepatic tissue and PL fraction (most alteration). Moreover, FB1 has induced lipid peroxidation in the liver but not in the kidney, at least under the exposure dose and period of this study.

Biography

Omeralfaroug Ali is a PhD Fellow at University of Kaposvar, Hungary. Since July 2017, he has been Member of MTA-KE Mycotoxins in the Food Chain Research Group and works on the assessment of fumonisin B1 exposure on the cellular membrane lipids.

omeralfaroug.ali@gmail.com

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