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Orally administered T-2 and Fumonisin B1 affects cation exchange of rabbit erythrocytes

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Pannon White weaned rabbits were fed on diets artificially complemented with 2 mg/kg diet T-2 toxin, or 10 mg/kg diet fumonisin B1 (FB1), and both toxins in a combination (2+10 mg/kg, resp.). The control was fed on a toxin free, fully identical diet. Blood was sampled after 2 and 4 weeks of administration. Body and liver weight of the T-2 group was lower after 4 weeks. After full red cell lysis in a hypotonic buffer cellular membranes were isolated with centrifugation (30000 g/10 min) and the cation transport was implemented as the breakdown of ATP in the absence and in the presence of a selective sodium pump inhibitor, ouabain. Results were interpreted as the difference between the inhibited and non-inhibited treatments, and were given as liberated inorganic phosphate (nmol Pi/mg protein/ h.) The red blood cell (RBC) total, ouabain sensitive Na+/K+ ATPase activity decreased after 4 weeks in the T-2 group, increased in the FB1 group and antagonistic effect was revealed by the T-2+FB1 group (enzyme activity identical with the control). The RBC membrane fatty acid composition was altered by both mycotoxins similarly during the entire feeding. Considering hematology, after 4 weeks T-2 alone and in combination with FB1 increased mean cell volume (MCV). Time-dependent alterations in the T-2 group were significant for MCV and the mean cell hemoglobin, both parameters increasing. The active monovalent cation transport was significantly influenced by both T-2 and FB1 as well. Most probably FB1 exerts its sodium pump activity modification via an altered ceramide metabolism (behenic acid (C22:0) proportional decrease in the RBC membrane composition), while for T-2 toxin a moderate membrane disruption and enzyme (protein) synthesis inhibition was supposed (ca. 75% decrease of the ouabain sensitive sodium pump activity).

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