

DESCRIPTION FOR THE GENERAL PUBLIC

Mycotoxins are secondary metabolites of molds that have adverse effects on humans, animals, and crops that result in illnesses and economic losses. The worldwide contamination of foods and feeds with mycotoxins is a significant and increasing problem. Trichothecenes, including deoxynivalenol (DON) are one of the mycotoxins of greatest agro-economic importance. Animal exposure to DON and other mycotoxins occurs predominantly through ingestion of contaminated feed. Mycotoxins have various acute and chronic effects on animals, especially monogastrics, depending on species. In case of DON pig belongs to the most susceptible specie. Prolonged exposure of pigs to DON present in feed even in very low doses results in impaired functionality of gastrointestinal and immune system. It is well documented that DON causes increased permeability of intestine barrier what enhances the risk of various xenobiotics or even pathogens absorption. On the other hand, from time to time there is a need to treat the pigs with antibiotics. The effectiveness of antibiotic therapy depends largely on drugs bioavailability and actual status of immune system activity. Since it is known that DON affects intestine and immunological health and functions it is proposed to verify the possible interactions of DON and selected antibiotics towards gastrointestinal and immune systems. The range of antibiotics applied in the study corresponds to their usage in swine production. In Europe, the most commonly used antibiotics include doxycycline, tylosine/tiamulin, amoxicillin, benzyl penicillins, and colistin. Based on this data, the authors decided to analyze the interactions between DON and doxycycline, amoxicillin, and tiamulin. For the purpose of the study three experimental models will be employed. The effect of DON in a combination with particular antibiotics on intestine structure and functionality will be studied on IPEC-J2 cell line and porcine isolated jejunal explants. Both models fulfill the criteria set for alternative experimental models and methods and do not require direct use of animals. IPEC-J2 cells are porcine intestinal columnar epithelial cells that were isolated from neonatal piglet mid-jejunum and will be used to verify the mechanism of interactions between DON and antibiotics. Porcine intestinal explants will be obtained from tissues of animals that undergo routine slaughter procedure and will serve experiments aimed at quantitative analysis of mycotoxin and antibiotics absorption. All samples collected during absorption studies will be analyzed using very precise analytical methods (LC-MS/MS). The effect of combined use of DON and antibiotics towards immune system will be investigated by cytokines analysis.