

Ketosis is a major metabolic disorder among dairy cows in early lactation resulting in significant economic losses in dairy farming. This disease is associated with numerous morphological and functional changes in the liver. Mycotoxins, on the other hand, are a group of highly toxic compounds produced by fungi that can infect dairy cattle, especially during stressful periods when they are immune-suppressed. When the animal diet contains corn silage, one of the main mycotoxin contaminants is zearalenon (ZEA). Considering that the liver is the main organ responsible for detoxification, the hypothesis of the current study is that liver of ketotic cows copes worse with negative effects of Zearalenone.

The study will be carried out on hepatocytes biopsied from healthy cows and cows in state of ketosis, cultured in vitro and exposed to a various doses of Zearalenone. Afterwards, using modern molecular biology techniques (such as qPCR, Western blot, ELISA, fluorescence methods) we will assess the influence of this mycotoxin on hepatocytes, mainly on energy metabolism and detoxification pathways.

As a result of this project we will be able to compare the influence of ZEA on many aspects connected to the proper function of the liver in ketotic and non-ketotic hepatocytes. Additionally, we will be able to introduce the new research model suitable for toxicological studies. Moreover, data obtained in this research will also give a better insight into molecular basis underlying cows ketosis which will allow to develop the new patterns of proceeding with cows with this disease in order to protect them against mycotoxins.