ABSTRACTS OF LECTURES AND POSTERS

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MITIGATING THE NEGATIVE IMPACT OF MYCOTOXINS
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EFFICACY ASSESSMENT OF A YEAST CELL WALL-BASED PRODUCT IN REDUCING THE MYCOTOXINS ORAL BIOAVAILABILITY IN RATS

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In addition to the immunomodulatory and antimicrobial properties, yeast cell walls (YCWs) are widely used as feed additives for mycotoxin control. YCW are known to adsorb zearalenone (ZEA), while data on other toxins are conflicting. In this study, a new YCW product was developed to sequester a large spectrum of mycotoxins (aflatoxin B1 (AFB1), ZEA, ochratoxin A (OTA), and fumonisin B1 (FB1)), and its efficacy was assessed first *in vitro* by the isotherm approach, and then *in vivo* with rats. The product at 0.5% w/v dosage adsorbed simultaneously up to 80% ZEA, 65% OTA, 40% FB1 and 10% AFB1 from multi-mycotoxins buffers containing 1 µg/ml of each toxin. The adsorption isotherm approach allowed us to study the adsorption mechanism and to determine the parameters affecting mycotoxin uptake, i.e., type and toxin concentration, pH of the medium and adsorbent concentration. For the study with rats (0.3 kg initial bw), each mycotoxin was administered singularly by a single oral intragastric bolus containing the mycotoxin +/- the product. Two groups of rats were used for each mycotoxin: the control groups received the mycotoxins at the dose of 12, 1, 0.5 and 0.12 mg/kg bw for FB1, ZEA, OTA or AFB1, respectively, while the treated groups received the same dose of mycotoxins with the YCW (0.5% w/w of feed consumption). Feed intake was 100 g feed/kg bw. After toxin administration, rats were housed individually in metabolic cages to collect urine at different time points (4-72 h for AFB1, ZEA and FB1; 4-320 h for OTA). The mycotoxin biomarkers (AFM1, ZEA and its metabolites of phase I biotransformation, i.e., α-ZOL, β-ZOL and β-ZAL, OTA and FB1) were determined in urine by in-house validated HPLC/UHPLC methods. Mycotoxin content in urine was normalized to the respective creatinine concentration. Toxicokinetic parameters, i.e., area under the curve over 72/320h ($AUC0\rightarrow t$) and maximal urine concentration (C_{max}) were calculated for target mycotoxins/metabolites and were used to compare control and treatment groups. The YCW reduced the urinary excretion of ZEA, FB1 and OTA, but it was ineffective for AFB1. In particular, AUC was significantly reduced by -50% for OTA ($P = 0.014$) and -42% for FB1 ($P = 0.048$), while C_{max} value was reduced by -79% ($P < 0.029$) for ZEA and its metabolites. Taking into account overall findings, a good relationship was observed between *in vitro* and rat trials, and it can be concluded that the YCW may protect animals from the harmful effects of multi-mycotoxins contaminated feeds. **Acknowledgements**. This research was supported by the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 678781 (MycoKey) and by the European Union's Horizon 2020 research and innovation programme under Grant agreement No 952337 (MycoTWIN).

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FIRST *IN VITRO* EVIDENCES OF SPORIDESMINS ADSORPTION BY A CLAY-BASED MATERIAL

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Sporidesmin A is the most important mycotoxin produced by the fungus *Pithomyces chartarum* that grows on pasture litter during late summer and autumn. This fungus produces several variants of sporidesmin (from A to J), with sporidesmin A accounting for 80-90% of congeners. Sporidesmins affect the hepatobiliary system of ruminants and lead to the retention of phytoporphyrin which, reacting with light in peripheral tissues, causes the photosensitivity reaction known as "facial eczema". The disease produces losses in animal production and serious animal welfare problems in farmed ruminants in New Zealand and in warm temperate regions of the world. Zinc in several forms and with high dose rates is used as a control measure for facial eczema, but it poses safety issues. Other additives for sporidesmins control in feeds have not been evaluated. The use of adsorbing agents to reduce the exposure to mycotoxins by decreasing their bioavailability is a valuable strategy to cope with mycotoxins. To this scope, this study examines the ability of a clay-based agent in sequestering sporidesmins from liquid mediums at physiological pH values (2.5-6.5). The adsorption behaviour of the clay for sporidesmins was studied by equilibrium isotherms as a function of pH, clay dosage, initial toxin concentration, equilibrium time, and temperature. Physico-chemical, kinetic, and thermodynamic parameters related to the adsorption process were calculated, including the adsorbent dosage to achieve a 50 (C_{50}) and 100%