

BIOBURDEN AND MYCOTOXIGENIC BURDEN IN ONE PORTUGUESE DAIRY – EXPLORATORY STUDY

Susana Viegas^{1,2*}, Ana Monteiro¹, Tiago Faria^{1,3}, Liliana Aranha Caetano^{1,4}; Anita Quintal Gomes^{1,5}; Magdalena Twarużek⁶; Carla Viegas^{1,2}

¹ H&TRC- Health & Technology Research Center, ESTeSL- Escola Superior de Tecnologia da Saúde, Instituto Politécnico de Lisboa. ² Centro de Investigação em Saúde Pública, Escola Nacional de Saúde Pública, Universidade NOVA de Lisboa, Lisbon, Portugal, ³ Centro de Ciências e Tecnologias Nucleares, Instituto Superior Técnico, Universidade de Lisboa, E.N. 10 ao km 139,7, 2695-066 Bobadela LRS, Portugal; ⁴ Research Institute for Medicines (iMed.Ulisboa), Faculty of Pharmacy, University of Lisbon, Lisbon, Portugal; ⁵ University of Lisbon - Institute of Molecular Medicine, Faculty of Medicine, Lisbon, Portugal; ⁶ Kazimierz Wielki University, Faculty of Natural Sciences, Institute of Experimental Biology, Department of Physiology and Toxicology, Bydgoszcz, Poland

*Presenting author: susana.viegas@estesl.ipl.pt

Dairies workers are engaged in activities including feeding and milking of cows and cleaning up manure on a daily basis. In this occupational environment there are several environmental factors that can boost bioburden and mycotoxins, becoming not only an occupational health problem but also a public health risk. This study intended to characterize occupational exposure to bioburden and mycotoxins in one Portuguese dairy.

Each sample (air, surface swab, raw material and feed) was directly incubated or inoculated on selective media for fungi and bacteria. Molecular detection of the toxigenic *Aspergillus* sections *Flavi*, *Fumigati*, *Circumdati* and *Versicolores* will be performed shortly. Thirty-seven mycotoxins were analyzed using LC-MS/MS system and detection was carried out using high performance liquid chromatograph (HPLC) Nexera (Shimadzu) with a mass detector API 4000 (Sciex).

Air fungal load ranged from 120 to 510 CFU/m³ and *Aspergillus* section *Fumigati* was the most prevalent (48.5%) on malt extract agar (MEA) and the “clean room” was the sampling with higher fungal load. Total bacterial load indoor air ranges from 1010 to 6040 CFU/m³, with the “clean room” presenting the highest value. Regarding total and gram-negative bacteria, the limit wasn't exceeded although the values were higher than outdoor for almost all the samples. Regarding surface samples, mesophilic bacterial population ranged from 68×10⁴ CFU/m² to uncountable. Gram-negative bacteria were present in two sampling places. Regarding data from fungal burden obtained by molecular tools and mycotoxins results, samples are still being analyzed but expected to be concluded until the end of June. The results document a broader characterization of occupational exposure to bioburden and mycotoxins in one dairy, being useful for policies and stakeholders to act to improve workers' safety. Additionally, actions taken to reduce workers exposure will contribute for reducing the risk of food contamination.