O.438. Prevalence and control of Shiga toxin-producing E. coli: from diversity in dairy cattle to phage therapy

Carla Dias[1], Andressa Ballem[2], Ana Pinto[3], Gonçalo Almeida[2], Pablo Fuciños[4], Carina Almeida[2], Maria José Saavedra[3,5], Filipe Silva[5], José Almeida[5], Jorge Azevedo[5], Maria José Gomes[5], Hugo Oliveira[1]

[1]Centre of Biological Engineering (CEB), University of Minho, Campus de Gualtar, Braga, Portugal

[2]National Institute for Agrarian and Veterinary Research (INIAV), Vila do Conde, Portugal.

[3]Veterinary Science Department, University of Trás-os-Montes and Alto Douro (UTAD), Vila Real, Portugal

[4]International Nanotechnology Laboratory (INL), Braga, Portugal

[5]Animal Science Department, and Animal Science Research Center (CECAV), University of Trás-os-Montes and Alto Douro (UTAD), Vila Real, Portugal

Shiga toxin-producing *E. coli* (STEC) strains are important foodborne pathogens worldwide, transmitted from ruminant to humans through contaminated food. Their control is still a challenge as most *E. coli* in nature are commensal and, thus, controlling strategies should target only pathogenic strains/serotypes. Bacteriophages (bacterial viruses) can cope with this challenge by allowing a tailored intervention. We performed an epidemiological study of STEC at 21 milk farms across the Northern region of Portugal and evaluated the potential of bacteriophage therapy to control the well-known O157 STEC serotype. From 409 dairy cattle analyzed, STEC strains were more prevalent in heifers (45 %) than in lactating cows (16 %). STEC isolates with several *stx1 and stx2* subtypes were identified and they belonged to 73 different O:H serotypes. Regarding bacteriophage therapy evaluation, an O157-specific phage (CBA120), was tested *in vitro* and *in vivo*. The bacteriophage reduced STEC in contaminated ruminant fluids of rumen and intestine (>4 logs) as well as STEC biofilms adhered with intestinal mucosa (>2 logs). Moreover, bacteriophage treatments significantly reduced *E. coli* O157:H7 numbers (1 log) in artificially contaminated sheep, comparatively with the mocked-treated group. Overall, results suggest the potential use of bacteriophages to control STEC *in vivo*.

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