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Rectal administration of lactoferrin powder clears *Escherichia coli* O157:H7 in calves and enables an EspA and EspB-specific immune response.

Authors & affiliations: (Author names (Font Times New Roman, Size 10, Italic, Centered, Line spacing 10 pt ;Underline the presenting author); Affiliations (Font Times New Roman, Size 9, Italic, Centered, Line spacing 10 pt))

Rybarczyk J.¹, Kieckens E.¹, De Zutter L.², Remon J.P.³, Vanrompay D.⁴, Cox E.¹

1Laboratory of Immunology, Faculty of Veterinary Medicine

2 Department of Veterinary Public Health and Food Safety, Faculty of Veterinary Medicine

3 Laboratory of Pharmaceutical Technology, Faculty of Pharmaceutical Sciences,

4 Department of Molecular Biotechnology, Faculty of Bioscience Engineering, UGent, Belgium

Joanna.Rybarczyk@UGent.be

Abstract: (Your abstract must use Font Times New Roman 10, Normal style, Line spacing 14 pt. It must be divided in 4 sections and must fit in this box. Your abstract should be no longer than 304 words.)

Introduction: Cattle are considered to be a primary reservoir of enterohemorrhagic *Escherichia coli* (EHEC), therefore inhibition of EHEC colonization and shedding in ruminants could control the risk of human exposure to this pathogen. Various strategies have been tried to reduce the colonization in cattle, however they show only limited results. The terminal rectal mucosa has been identified as the predominant colonization site of *E. coli* O157:H7 in cattle, thus a possible intervention approach should directly target this colonization site.

Aims: To evaluate rectal application of bovine lactoferrin as a strategy to control *E. coli* O157:H7 infection in cattle and to evaluate the effect of this treatment on the immune response against this infection.

Results: In experimentally *E. coli* O157:H7 infected calves, rectal application of bovine lactoferrin not only decrease shedding but could completely erase the infection in cattle after 18 days of treatment. The daily application of lactoferrin powder on the rectal mucosa cleared this site from bacterial colonization within one week.

The effect of the previous treatment with lactoferrin on the immune response against the *E. coli* infection was evaluated by re-infecting the animals and measuring systemic and local antibody responses. The most important observation was that rectal administration of bovine lactoferrin induced a rectal IgA response against EspA and EspB what resulted in a lack of rectal colonization. These mucosal antibodies were not detected in the animals which did not receive lactoferrin. Serum IgA antibodies could not be found in any animal of the group that received the treatment.

Conclusions: These findings emphasize the ability of lactoferrin to clear EHEC colonization in cattle and stimulate the local immune response against *E. coli* O157:H7 infection. Thus, the bovine lactoferrin could be used in the field to eliminate high-level faecal excretion of EHEC in cattle and thereby reduce the zoonotic risk for humans.

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