Lactoferrin as a new treatment approach of *E. coli* O157:H7 infected ruminants.

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### INTRODUCTION

Food contamination with *E. coli* O157:H7 by ruminant manure has been reported as the primary source of human infection, therefore inhibition of *E. coli* O157:H7 colonization and shedding in ruminants could control the risk of human exposure to this pathogen. To evaluate a new treatment approach, we studied the ability of bovine lactoferrin (Lf), a natural antimicrobial protein of milk, to reduce *E. coli* O157:H7 infections in calves and in sheep.

### RESULTS

In calves (Fig. 1), magnitude and duration of fecal O157:H7 shedding was similar for the oral treatment group and the control group. Animals in both groups were excreting bacteria in the feces during at least 54 days. In contrast, rectal administration of LF induced a reduction in fecal *E. coli* O157:H7 excretion from day 8 onwards. The shedding pattern of the rectal treatment group and the control group was significantly different from days 19 to 22 and days 33 to 36 (*p* ≤ 0.05). On day 12, two animals from the rectal treatment group already ceased excreting *E. coli* O157:H7. Both stayed negative till the end of the experiment (day 36) without further LF administration, even though the other animal in this group remained positive by direct enumeration until day 26.

In sheep (Fig. 2), the oral administration of 0.3 g LF/day could not reduce the excretion of *E. coli*. Therefore, after 19 days of treatment, we raised the daily dose to 3 g LF/day. Subsequently, fecal shedding decreased in the LF group, although there was no significant difference between the LF group and the control group.

### CONCLUSIONS

Our data demonstrate the reduction of *E. coli* O157:H7 shedding in calves and sheep due to administration of lactoferrin. In conclusion, lactoferrin could be used to clear *E. coli* O157:H7 infection in ruminants and could thereby reduce the zoonotic risk for humans.