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Presentation Title:

Recombinant vaccine reduces the excretion of *Escherichia coli* O157:H7 in cattle and elicits high titres of bacteria-targeted antibodies in colostrum

Abstract:

Enterohemorrhagic *Escherichia coli* (EHEC) O157: H7 was the most prevalent EHEC serotype recovered from patients with hemolytic uremic syndrome (HUS) in Argentina, a country with a high incidence of this disease in children. The main reservoir for *E. coli* O157: H7 is healthy cattle, which harbour this organism in their intestinal tract, especially in the lymphoid follicle-dense mucosa at the terminal rectum. Vaccination of cattle could be a logical strategy to fight infection in humans. Our study evaluated a recombinant vaccine based in the carboxyl-terminal fragment of  $\gamma$ -Intimin and EspB, two key colonization factors of *E. coli* O157: H7. A significant reduction in total bacterial shedding and frequency of *E. coli* O157: H7 excretion between vaccinated and control groups was observed over the sampling period. Significantly high titres of  $\gamma$ -Intimin- and EspB- specific serum IgG antibodies were observed after the first immunization. An IgG and IgA specific response was also observed in saliva. These promising results suggest that systemic immunization of cattle with intimin and EspB could be a feasible strategy to reduce EHEC O157:H7 fecal shedding. Furthermore, vaccination of pregnant cows with recombinant  $\gamma$ -Intimin, EspA, EspB and inactivated Shiga toxin 2, the main *E. coli* O157:H7 virulence factors, induced high titres of specific antibodies in colostrum and in sera of calves after colostrum administration. Hiperimmune colostrum may be an alternative to protect calves from early colonization by *E. coli* O157: H7 and a key source of antibodies which could block colonization and toxic activity of that bacterium in the human intestine.

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**Strategies to reduce the infection by *Escherichia coli* O157:H7 in cattle and humans:  
a recombinant vaccine reduces bovine bacterial colonization and produces  
colostrum containing high titres of bacteria-targeted antibodies.**