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Experimental Intramammary Infection with a Strain of *Escherichia coli* Isolated from a Cow with Persistent *E. coli* Mastitis

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ABSTRACT

Transient *E. coli* intramammary infections (IMI) are usually associated with rapid onset of clinical signs including mammary gland swelling and abnormal milk with rapid clearance of bacteria from milk. Conversely, reports have described strains of *E. coli* showing very different clinical trends. Persistent *E. coli* IMI are associated with mild clinical symptoms that disappear shortly after the onset of infection, possibly flaring-up intermittently during lactation. In the present study, we evaluated a strain of *E. coli* isolated from a cow with persistent mastitis to determine if the experimental infection model mimics naturally occurring persistent *E. coli* IMI. Uninfected mammary quarters of 7 Holstein heifers were infused within 10 days of calving with 50 colony-forming units of a persistent *E. coli* strain. Six of 7 heifers developed mild clinical mastitis with elevated rectal temperatures within 9 to 36 h after infusion. The challenge strain was isolated intermittently in milk from all infected mammary quarters during the first two weeks after infusion and 3 animals continued to shed *E. coli* periodically during the sampling period. One animal shed *E. coli* intermittently in milk for 172 d after challenge and developed clinical mastitis four times during this period. The isolated strain had an identical pulsed-field gel electrophoresis profile as the *E. coli* strain used to infuse mammary glands. The experimental IMI model described here mimics very closely naturally occurring persistent *E. coli* IMI, thus providing an excellent *in vivo* model to better understand pathogenesis and to facilitate development of control strategies for this important mastitis pathogen.

KEYWORDS

Escherichia coli; Intramammary Experimental Infection; Persistent Mastitis; Dairy Cows

Cite this paper

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