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Application of probiotics in the vaginal tract of periparturient dairy cows lowered the incidence of uterine infections and improved their overall pregnancy rates and health status

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Uterine infections affect almost half of dairy cows in a dairy herd and they are associated with infertility. High incidence of infertility is often associated with culling of cows and 15% (i.e., 54, 230 in 2010) of all cows culled in Canada are eliminated for failing to remain pregnancy. There are no treatments or prevention strategies to curb down the occurrence of uterine infections in dairy cows. Currently antibiotics are used to treat the sick cows; however, the high rate of culling indicates lack of efficiency. The objective of our work was to treat periparturient cows around parturition with a mixture of three lactic acid bacteria, isolated from the vaginal tract of healthy cows, to lower the incidence of uterine infections. Two experiments were conducted. In the first trial 82 pregnant cows, 2 wk before the expected day of calving, were randomly assigned into treatment (TRT; received 1 mL of probiotic bacteria in reconstituted skim milk at 10^{10} to 10^{12} cfu/treatment) and control group (CTR; received 1 mL of carrier only; reconstituted skim milk). Intravaginal infusions were performed once during wk -2, -1, +1, +2, +3, and +4 relative to parturition with probiotic bacteria isolated from the vaginal tracts of healthy cows including a mixture of *Lactobacillus sakei* FUA 3089, *Pediococcus acidilactici* FUA 3140, and *P. acidilactici* FUA 3138. In the second trial 150 pregnant cows, 2 wk before parturition, were randomly assigned into three groups: 1) receiving two probiotic treatments once a week during two weeks before calving; 2) receiving three probiotic treatments two 2 wk before parturition and one on the first wk after parturition, and 3) control group receiving 2 treatments with reconstituted skim milk before calving and one sham treatment after calving. Results from both experiments showed that administration of probiotics in the vaginal tract of periparturient dairy cows lowered the incidence of metritis and pyometra, decreased the incidence of vaginal purulent discharges and the number of cows with abnormal cervical size and uterine fluctuation. Involution rate of the uterus also was expedited. Treatment improved the overall pregnancy rates for the multiparous cows. More research is warranted to understand the mechanism(s) by which probiotics improved the overall health status of the animals.