Presence of bacteria in the endometrium and placentomes of pregnant cows

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Bacterial invasion of the bovine uterus during the postpartum period occurs in most cows, but the general consensus is that these bacteria are eliminated before the next pregnancy. The pregnant uterus has therefore hitherto been considered a sterile environment, but this assumption has now been challenged by recent studies in humans, which indicate that bacteria can be present in the placenta of term pregnancies without causing abortion. The aim of the present study was therefore to investigate whether bacteria are present in the uterus of pregnant cows. Specimens were taken from the intercaruncular endometrium and from placentomes of slaughtered pregnant cows (n = 43) and subjected to histology, fluorescence in situ hybridization and massive parallel sequencing. Bacteria were observed in the tissue from 90.7% (39/43) of the cows by fluorescence in situ hybridization. Fusobacterium necrophorum, Porphyromonas levii and Trueperella pyogenes were located within the endometrium, on the endometrial surface and in the caruncular stroma, but their presence was not associated with inflammation. Data from massive parallel sequencing of the 16S rRNA gene from a subset of 15 cows indicated that the most abundant bacteria were the families Porphyromonadaceae, followed by Ruminococcaceae and Lachnospiraceae. Our results indicate that the bovine uterus is not a sterile environment during pregnancy as previously assumed and that a cow can carry a pregnancy despite the presence of a few potentially pathogenic bacteria in the uterus.

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