

PROBIOTIC LACTOBACILLUS IN SEMINAL PLASMA

G. Sivaramakrishnan, M. J. Jasper, S. O'Leary, S. A. Robertson

Centre for Reproductive Health, Department of Obstetrics and Gynaecology, University of Adelaide, Adelaide, SA, Australia

Commensal bacteria of the *Lactobacillus* genus are implicated in beneficial 'probiotic' roles in the gut and other mucosal tissues. Their presence reduces the incidence of pathogenic infections, both passively and via production of antimicrobial substances, and through Toll-like receptor-mediated activation of cytokine expression in host tissues. Lactobacilli are present in the female reproductive tract but have not been examined in the male. This study aimed to investigate, by selective culture techniques and real-time quantitative PCR, the prevalence in boar seminal plasma of Lactobacilli compared with other pathogenic bacteria. Using acidified Rogosa Agar, Lactobacilli were cultured from 3/3 fresh semen samples and were found to be most prevalent in the first fraction of the ejaculate. For PCR, DNA was extracted from reference bacterial cultures and archived seminal plasma samples from 40 healthy boars. Bacterial species-specific primers targeting *Lactobacillus* 16s and 16s-23s rDNA sequences, and *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and *Bacillus*-specific *Sau3AI*, *oprL*, and 16s rDNA genes respectively, were used in real-time PCR assays employing SYBRgreen (Applied Biosystems) technology. Lactobacilli were detected in 22/40 (55%) of seminal plasma samples, while pathogenic bacteria were detected in <10% of samples (*Staphylococcus aureus*, 1/40; *Pseudomonas aeruginosa*, 2/40; and *Bacillus*, 3/40). The *Lactobacillus* content of individual boars ranged from 1.5 to 15×10^6 cells/mL, and within boars, content varied within 30% of the mean value in successive samples over a 6-month period. We conclude that Lactobacilli are present in abundance in boar seminal plasma compared to other potentially pathogenic bacteria. These bacteria may protect the male tract from pathogen infection, and after ejaculation, may influence the female immune response to male antigens. Ongoing studies will investigate whether Lactobacilli abundance in seminal plasma correlates with boar fertility, and examine the potential value of improving reproductive performance in pigs and other species by administration of probiotic agents.