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Antimicrobial resistance of *Corynebacterium* spp. in the vaginal flora of gilts and sows in Sweden

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Semen extenders for fresh boar semen include antibiotics, according to official guidelines, to control the growth of bacteria contaminating the semen during collection. However, it is not known if this use of antibiotics leads to the development of antimicrobial resistance in the vaginal flora of inseminated pigs or whether this resistance could spread to other animals (including human beings) or the environment.

Objective: The antimicrobial resistance pattern of *bacteria* isolated from the vagina from non-inseminated gilts and from sows that had already had three litters of piglets following artificial insemination.

Methods: Vaginal swabs were taken from 30 sows and 30 gilts on three farms in the middle of Sweden during the autumn of 2018. The swabs were directly cultured on blood agar, lactose purple agar, mannitol salt agar, Colistin-Oxolinic Acid-Blood Agar (COBA) and Man, Rogosa and Sharpe agar (MRS-agar).

In total, 280 bacterial isolates were identified by Matrix-Assisted Laser Desorption/Ionization Time of Flight Mass Spectrometry: 73 % of them consisted of *Staphylococcus* spp., *Streptococcus* spp. and *Corynebacterium* spp. Fifty-two isolates of *Corynebacterium* spp. were tested for susceptibility against 16 selected antimicrobial substances, assessed with VetMIC™ Lact-1 and VetMIC™ Lact-2 (SVA, Uppsala Sweden), by determining the antimicrobial minimum inhibitory concentrations (MIC). Epidemiological cut-off (ECOFF) values for determining susceptibility were obtained from the European Committee on Antimicrobial Susceptibility Testing (EUCAST). The difference in antibiotic resistance for *Corynebacterium* spp. between gilts and sows was analysed by Chi-squared or Fisher's exact test.

Results: The *Corynebacterium* isolated were identified as *C. aurimucosum*, *C. casei*, *C. confusum*, *C. freneyi*, *C. glucuronolyticum*, *C. glutamicum*, *C. stationis*, and *C. xerosis*. Most (>80%) *Corynebacterium* spp. were resistant to clindamycin, but the difference between gilts (85.71%) and sows (95.83%) was not significant ($p = 0.45$). A few (<20%) *Corynebacterium* spp. were resistant to gentamicin (3.57%:4.17%), penicillin (10.71%:12.5%), vancomycin (3.57%:4.17%), ciprofloxacin (3.57%:4.17%) and rifampicin (0%:4.17%), but no significant differences were found between the gilts and sows ($p > 0.05$). None of the *Corynebacterium* showed any resistance to linezolid. *Corynebacterium* isolated from gilts were more often resistant to tetracycline compared with *Corynebacterium* from sows (15%:4.17%) ($p = 0.04$). However, since only a few farms were included in the study, with few individuals per farm, this significance should be interpreted with caution.

Conclusion: *Corynebacterium* from both gilts and sows showed low resistance to most of the antibiotics tested, with the exception of clindamycin. More isolates from gilts were resistant to tetracycline compared with isolates from sows, which may be due to contact with this antibiotic during the early life of the gilts, followed by the waning of resistance with time. Unfortunately, it is not known which antibiotics were contained in the semen extender used for the inseminations since it was not obligatory at the time for the manufacturer of the extender to provide such information.