Presence of antimicrobials in semen extender and their effect on swine *in vivo* embryo development

Presença de antimicrobiano em diluente seminal e seu efeito no desenvolvimento embrionário in vivo em suínos

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Artificial insemination (AI) is a widely adopted practice in Brazilian swine production, accounting for over 90% of pregnancies. Reproductive efficiency is a crucial economic factor in swine farming, determined by the number of piglets weaned per sow annually. Reproductive success is directly linked to semen quality, with bacterial contamination potentially compromising pregnancy rates. To mitigate contamination effects, the inclusion of antimicrobials (ATB) in semen extenders is common practice. However, indiscriminate use of these compounds has led to bacterial resistance, becoming a global concern and prompting the search for alternatives to antimicrobial use in swine semen extenders. This study aimed to evaluate swine *in vivo* embryo production without the use of antimicrobials in semen extenders. Semen doses were prepared with (ATB group: gentamicin at 0.25 g/L in conventional blisters) and without antimicrobials (NO ATB group: blisters containing bacteriostatic particles in the plastic), stored at 16–18 °C for 72 hours, and subsequently used to inseminate gilts (ATB n = 8; NO ATB n = 7). All females were in their third estrous cycle without hormonal synchronization. Gilts were cervically inseminated with three semen doses from the same boar, each containing 2.5×10^9 spermatozoa. Five days after the last AI, the females were slaughtered, and the complete reproductive tract was collected and transported in saline solution (0.9%) at 37 °C to the laboratory. The total number of corpora lutea per gilt was assessed, and embryos were recovered by flushing the oviduct and uterine horns with warmed PBS. Embryos were then classified according to their developmental stage. The embryo recovery rate (Grade I) was 65% (70/107) for the NO ATB group and 54% (70/128) for the ATB group. Embryo development kinetics differed between treatments ($p < 0.05$). Additionally, when evaluating the embryo recovery at the expected developmental stage for the collection time (five days post-AI), slower embryo development was observed in the ATB group (NO ATB group: 57%, 62/107; ATB group: 31%, 40/128). In the ATB group, 30 structures were recovered at stages earlier than morula (2/4 cells, 8/16 cells, 16/32 cells), whereas only eight were recovered in the NO ATB group. At the morula stage, 16 structures were recovered in the ATB group, compared to 36 in the NO ATB group. The ATB group had 16 embryos at the blastocyst stage and eight at the expanded blastocyst stage, while the NO ATB group had 12 blastocysts, five expanded blastocysts, and nine hatched blastocysts. This study associates the use of antimicrobials in semen extenders with alterations in the production and developmental kinetics of pig embryos.

Palavras-chave: *suíno, sêmen, antimicrobianos, embriões.*
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