

8 Pregnancy Trials Using the Device for Improved Semen Collection

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OBJECTIVE

It is well documented that sperm undergo significant physiological and biochemical processes, many of them brought on by changes in the environment at ejaculation. While the preponderance of the individual changes can be seen as positive and necessary for fertilization, collectively they set the cell on course for its eventual death. Previous research from this laboratory has demonstrated that modification of the collection environment using the Device for Improved Semen Collection (DISC), can lead to a delay in certain activation pathways and help provide a better quality sample for treatment procedures. A small human trial demonstrated superior semen parameters and equivalent pregnancy rates. The present study presents pregnancy data in two controlled trials in domestic animal species.

DESIGN

Controlled prospective trial.

MATERIALS AND METHODS

Two large scale pregnancy trials were conducted with the DISC in the equine and bovine. In both trials, semen was collected from the males in a real-time split collection where approximately half of the ejaculate was collected into the DISC or an appropriate control. Semen parameters were measured manually at the time of collection and time of insemination. In the equine trial mares were inseminated at ovulation with semen 24, 48, or 72 hours old to mimic industry practice (49 total inseminations). In the bovine, 43 females were divided for insemination with semen from either control or DISC collections. Inseminations were timed to occur 12 hours after semen collection using industry standard techniques. Pregnancy was determined by ultrasound.

RESULTS

Semen parameters were similar between controls and DISC samples at collection ($p = 0.832$). Further, as expected all parameters decrease with time ($p < 0.01$). However, semen collected in the DISC retained more motility at all other time points: Bull ($p < 0.002$) and Stallion ($p < 0.001$). Pregnancy rates in the mares were similar between treatments at 24 hours, but higher at both 48 and 72 hours ($p < 0.001$). Pregnancy rates in cattle trended higher in animals inseminated with DISC semen ($p = 0.06$).

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CONCLUSIONS

Data continue to indicate semen collected in the DISC provides higher quality cells for reproductive purposes. Further, pregnancy rates appear higher in animals bred with semen from the DISC. Additional research is warranted to confirm these findings.

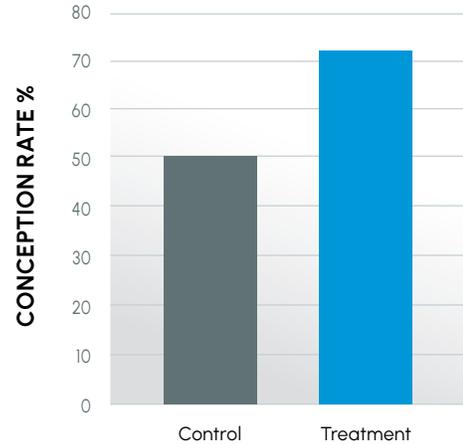
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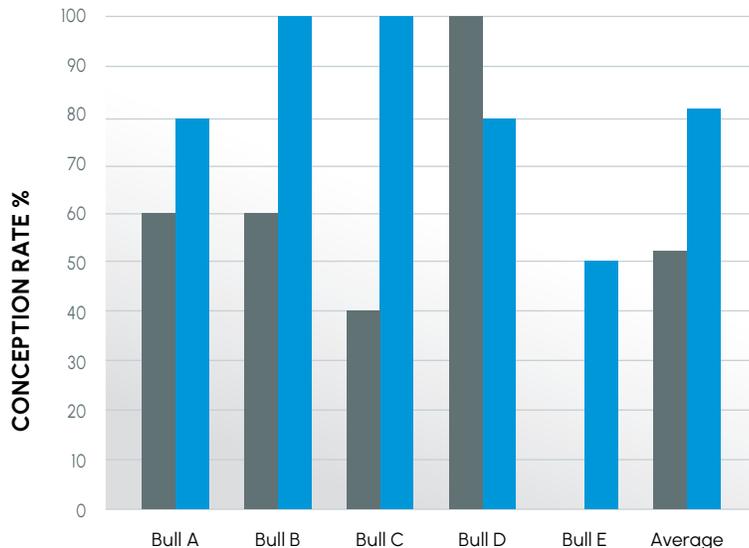
INSIGHTS

FIGURE 1

Large scale pregnancy trials were undertaken in both equine and bovine models using species-specific versions of ProteX (TrueBreed). In a herd of 43 commercial cattle females, pregnancy rate increased from 50% with traditional methods to over 70% using ProteX. Across six proven bull sires, only one had higher conception rates using traditional methods.



A commercial trial of conception rates in cattle using semen collected in the DISC (Treatment) vs. industry standard collection techniques (Control). Data suggests higher pregnancy rates from semen collected in DISC ($p < 0.02$).



■ SSC
■ DISC

FIGURE 2

A controlled trial of conception rates of cattle using semen collected in the DISC (Treatment) vs. the industry standard collection techniques (Control).

Data for individual bulls demonstrated a trend toward higher conception rates with semen from the DISC ($p < 0.06$) and a higher conception rate among all animals bred ($p < 0.01$).

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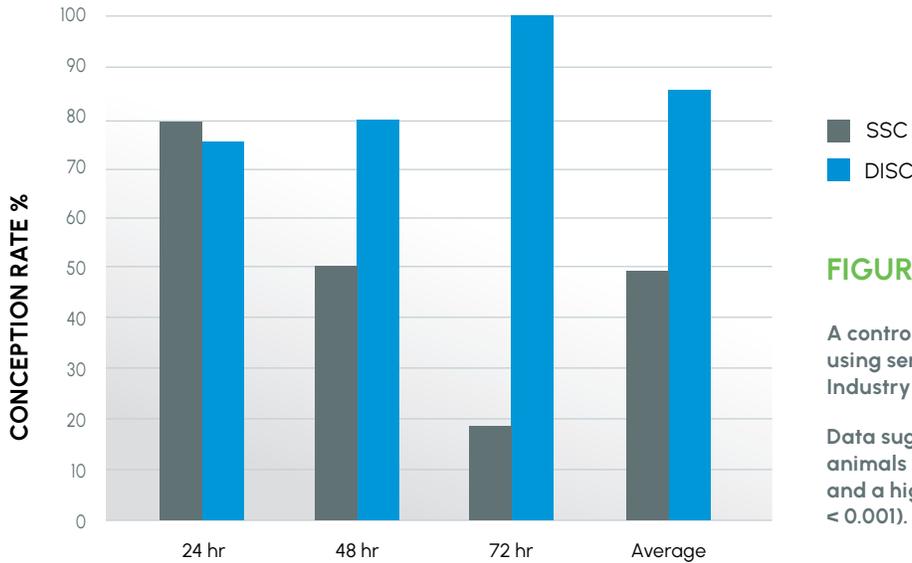


FIGURE 3

A controlled trial of conception rates of horses using semen collected in the DISC (Treatment) vs. Industry Standard Collection Techniques (Control).

Data suggest both a higher pregnancy rate in all animals bred with semen after 24 hours. ($p < 0.001$) and a higher cumulative rate from all breedings ($p < 0.001$).

INSIGHTS

It is standard practice in the horse-breeding industry to not use semen that is over 24 hours old due to the rapid decline of sperm quality. This is observed in the steady drop of conception rate in the control arm. This is contrasted by the observation from semen collected in the DISC, which saw a steady increase in conception rate over time and a significantly higher conception rate compared to control.