

Evaluation of novel antibiotic-free extender utilizing short-term hypothermic storage

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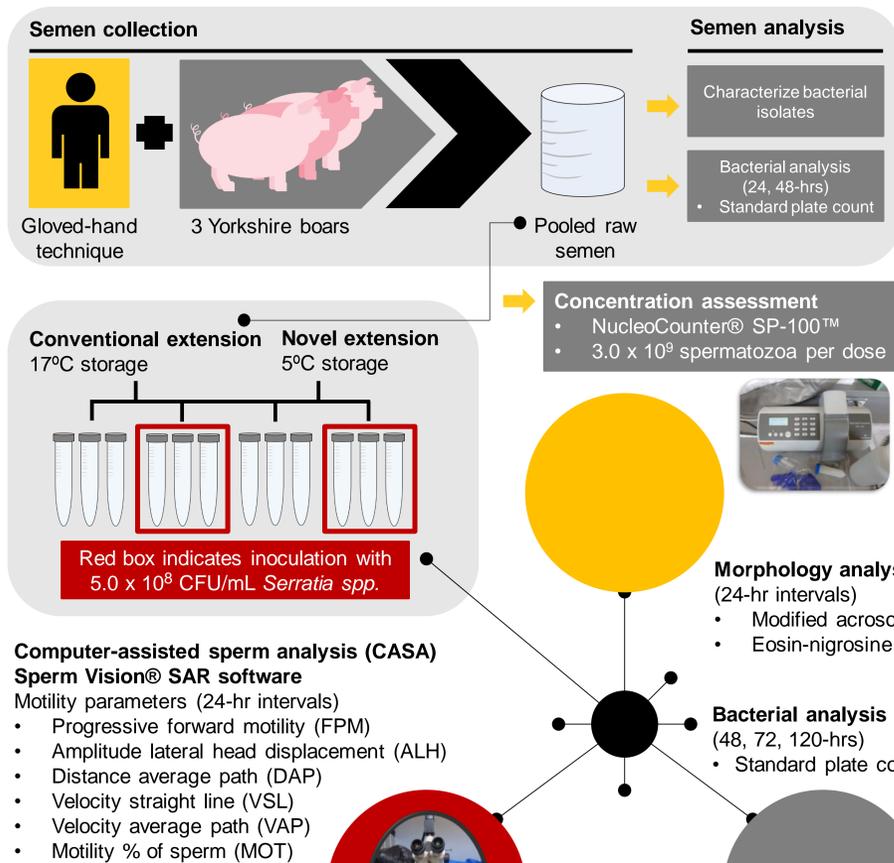
Background

Swine veterinarians are committed to judicious use of antimicrobials, which necessitates objective consideration of alternatives to common uses. The goal of this study was to evaluate two commercially available semen extenders by assessing 1. semen quality and 2. bacterial growth in a novel antibiotic-free hypothermic semen extender (novel) and an extender containing gentamicin (conventional).

Hypothesis

We hypothesize that if treated with a non-challenged bacterial groups then there will be no significant increase in bacterial growth between extenders, morphology will remain consistent between treatments and motility will show no significant difference for short-term storage.

Methods



Relevance to practitioners

Innovative developments in the field of boar semen extension allows for further judicious use of antimicrobials by practitioners.

Results

Bacterial analysis

Table 1: Bacterial isolates in pooled semen

<i>Aerococcus viridans</i>	<i>Neisseria species</i>
<i>Pseudomonas aeruginosa</i>	<i>Staphylococcus chromogenes</i>

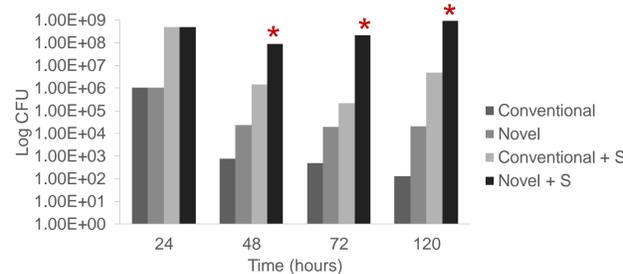


Figure 1: Logarithmic plot evaluating bacterial growth of treatment groups, Gentamicin containing conventional ± *Serratia* spp. (S) and antibiotic-free novel ± *Serratia* spp. (S) across six-days. * denote statistical significance ($p < 0.05$).

- No significant change in bacterial growth between the conventional and novel extenders in non-challenged doses.
- Challenged doses, regardless of treatment, contained more bacteria than non-challenged doses, as expected.
- Novel extender doses challenged with *Serratia* spp. displayed statistically higher growth than challenged conventional extender doses after day-3 ($p < 0.05$).

Semen analysis

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- Morphology did not vary statistically between treatment groups, but transition from acrosome intact to non-intact increased significantly across the six-day time period ($p < 0.05$) as expected.

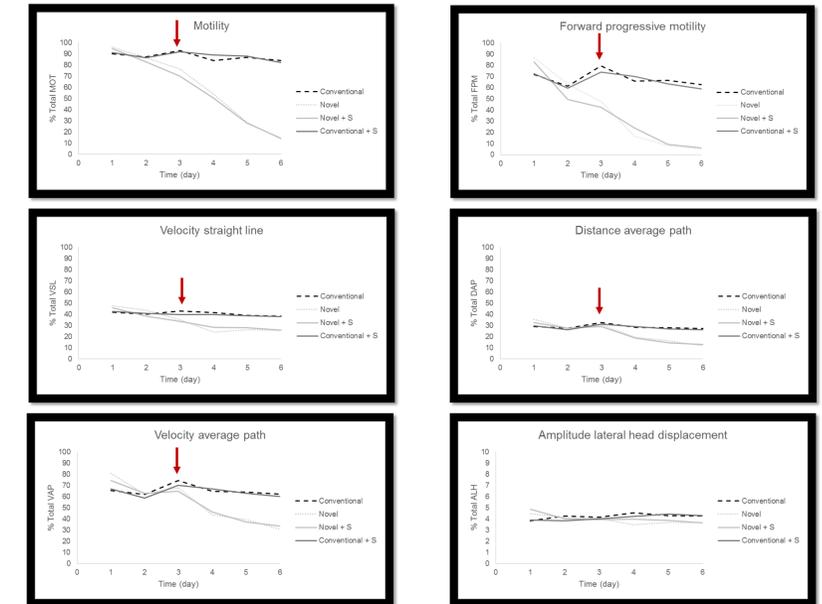


Figure 2: CASA (computer assisted sperm analysis) evaluated motility, Gentamicin containing conventional ± *Serratia* spp. (S) and antibiotic-free novel ± *Serratia* spp. (S) across six-days.

- FPM for the novel extender doses was significantly lower than the conventional extender doses beginning at 72-hours ($p < 0.05$).
- MOT, VSL, VAP, DAP, and ALH were also significantly lower ($p < 0.05$).

Conclusion

Unlike traditional extenders, the novel extender utilizes storage at 5°C to reduce bacterial growth. The unique formulation and properties of this extender allows for storage at hypothermic temperatures. These results indicate that viable sperm can be maintained using antibiotic-free extension when compared to conventional extension for short-term storage. Care must be taken when evaluating motility parameters so that storage temperature does not bias assessments. No fertility endpoints were evaluated in this study.

Future direction

Acknowledgements