BactiBag : an opportunity to reduce antibiotics use in boar semen processing

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CONTEXT

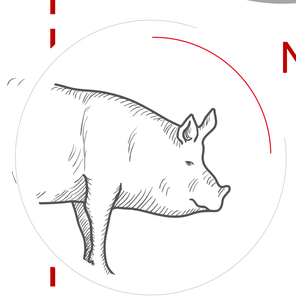
Bacterial growth control during swine semen production is a challenge for Semen Processing Centers. Raw ejaculates are processed at temperatures favorable for microbial multiplication. Prophylactic antibiotics addition to semen extender prevents undesirable bacterial growth. This use enhances the risk of selecting bacterial resistance to antibiotics. IMV-Technologies takes advantage of commonly used bacteriostatic molecules in plastics compositions to include it into the semen bag: BactiBag. This could allow inhibition of bacterial growth and prevents release of lipopolysaccharides inherent to bacterial death.

OBJECTIVE

To test the performances of BactiBag in **field conditions**, two consecutive studies were carried out.
Study 1 : to assess whether BactiBag affects semen quality and reproductive performances.
Study 2 : to study the reproductive performance of sows inseminated with semen extended with an antibiotic-free media and stored in BactiBag.

MATERIALS & METHODS

Study 1 — Effect of BactiBag on sperm quality



N = 29

Sperm at 17°C within 72 hours

Diluted in **NUTRIXcell+** (with Antibiotics)

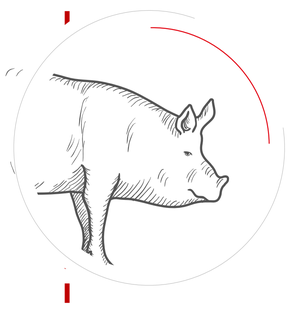
Split ejaculate into two parts

Control : GTB bag | **BactiBag**

Bacterial count (Guava® EasyCyte™)
Sperm viability (Guava® EasyCyte™)
Sperm total motility (IVOS II™)

384 sows inseminated

Study 2 — Effect of an antibiotic-free media stored in BactiBag on sperm quality



N = 25

Sperm at 17°C within 72 hours

Split ejaculate into two parts

1 Diluted in **BTS** Containing Antibiotics → **Control : GTB bag**

2 Diluted in **BTS** ~~Antibiotic~~ → **BactiBag**

Bacterial count (Guava® EasyCyte™)
Sperm viability (Guava® EasyCyte™)
Sperm total motility (IVOS II™)

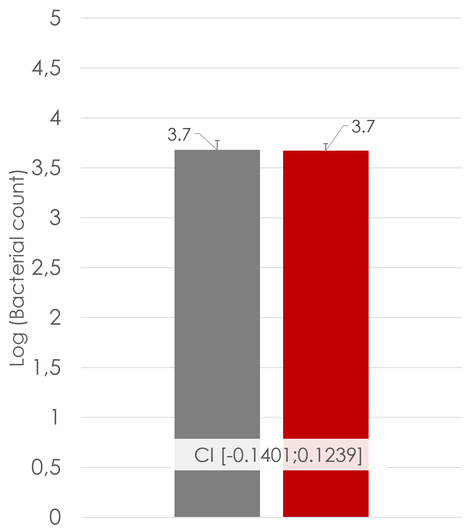
203 sows inseminated

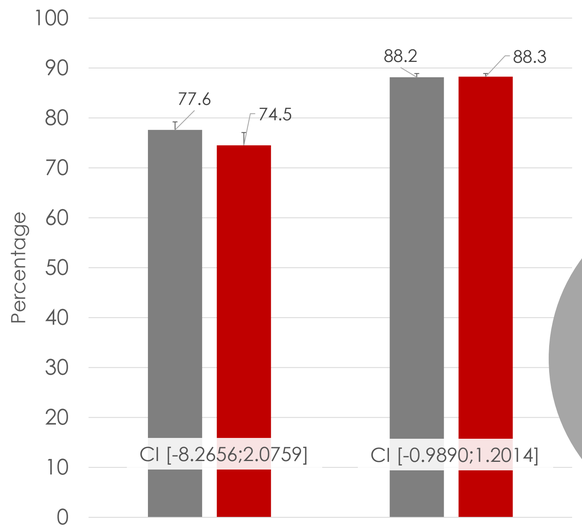
Statistics

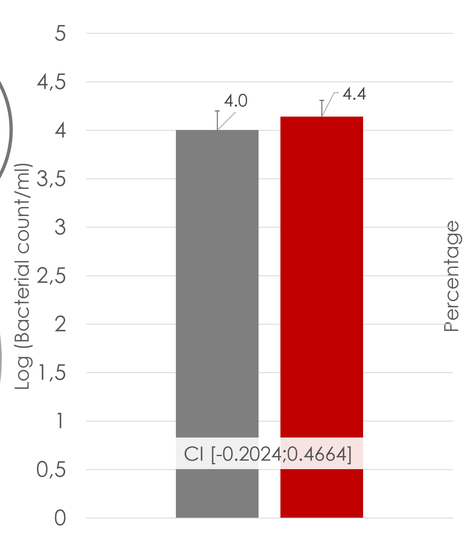
Statistical analyses have been performed using SAS® (SAS Institute Inc, Cary, NC, USA), version 9.1.4. For continuous variables, a Mixed Model Analysis of Variance was used. The farrowing rate was analysed using Fisher-Exact Test suing a Chi-Square probability distribution.
The results are presented as Least Square Means (LSM) ± standard errors and its 95% Confidence Interval (CI).

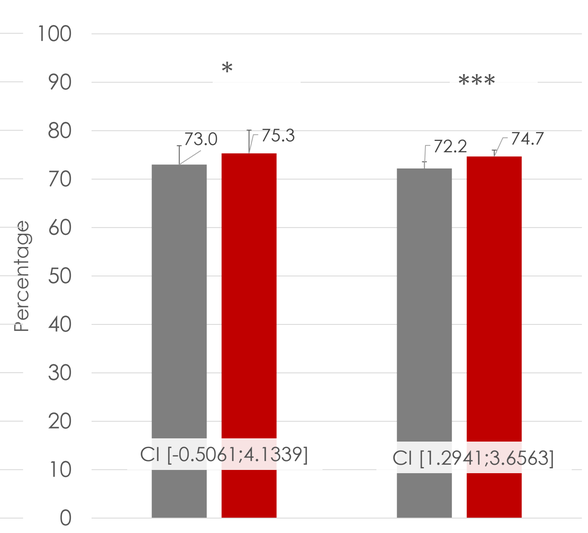
RESULTS

Laboratory







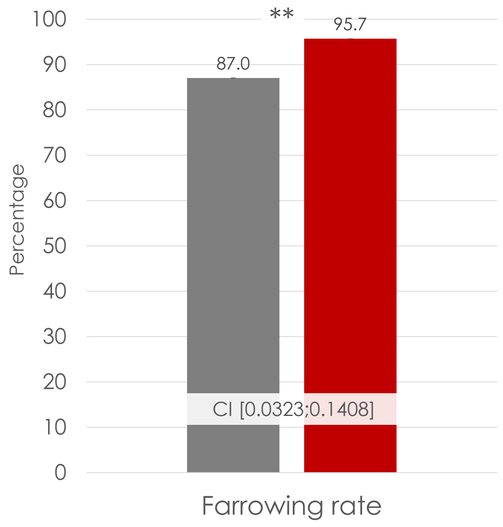


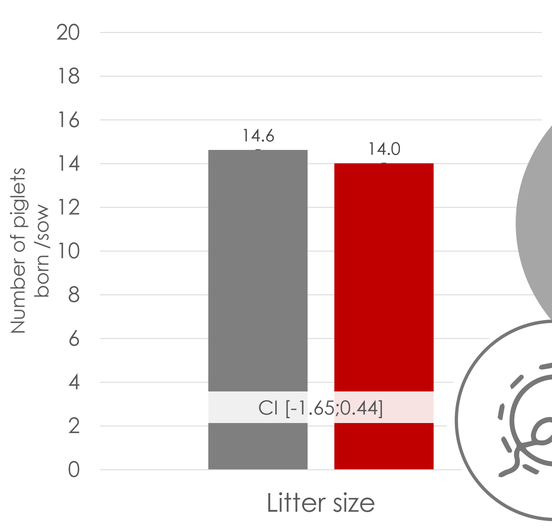
Log (Bacterial count) | Total motility | Viability

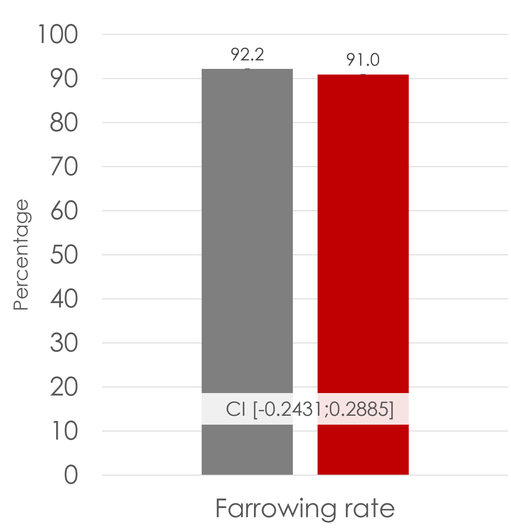
Control | BactiBag

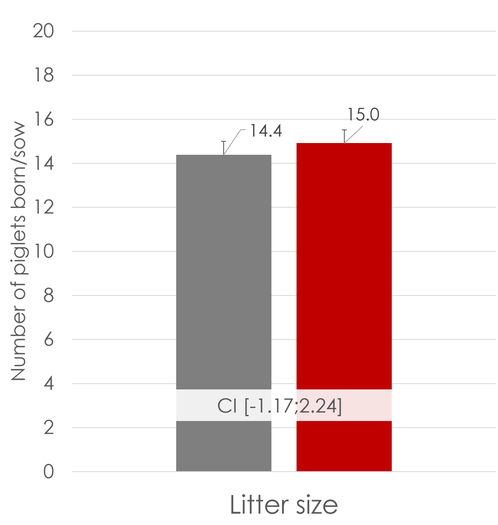
CI : 95% Confidence Intervall [Lower; Upper] of the model

Field Trial — Animal Insemination









CONCLUSION

BactiBag showed higher farrowing rate in Study 1 while higher total motility and viability rates were observed for BactiBag in Study 2. These two experiments showed that BactiBag is a **suitable aid to reduce the use of antibiotics in swine animal insemination**.