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Repopulation of Pseudorabies-Infected Swine Herds by Embryo Transfers

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Summary

Embryos were transferred from two pseudorabies infected herds to recipients from a pseudorabies free herd. All 38 donor sows had serum titers for pseudorabies but no recipients or pigs that were farrowed had clinical signs or serum titers for pseudorabies. In total 805 embryos were transferred to 34 recipient sows and gilts of which 22 (65%) farrowed 208 pigs (189 farrowed alive).

Introduction

Repopulation is a strategy frequently invoked to save genetically valuable swine herds infected with pseudorabies virus (PRV). Since vaccination is controversial, repopulation may be the only alternative for a seedstock producer. Cesarean section or hysterectomy has almost exclusively been the repopulation procedure used. However, one of us (J. James) has used embryo transfer to provide some pigs in herds otherwise repopulated by cesarean section and others at Land O'Lakes have used embryo transfer to save some bloodlines from an SPF herd after it became infected with pseudorabies.

In contrast, Purdue researchers found that in certain experimental conditions, when embryos were exposed to large numbers of PRV before transfer or the donor sow was injected with PRV after mating, PRV was transmitted to some recipient females.

Therefore, field experience is different from experimental results. This study was conducted to collect more information on embryo transfer's effectiveness for repopulating PRV infected herds under field conditions.

Procedures

Donor sows from two PRV infected herds (diagnosis confirmed by serum antibody titers) provided embryos which were surgically collected in Ames, IA and shipped to Sullivan, IL where they were transferred to sows and gilts from a PRV free herd. Donors were bled 3 weeks and 1 week before embryo recovery.

Embryos were stored between recovery and transfer in a Trans Temp[®] box at 35°C. Storage (culture) medium was a modified Krebs Ringer bicarbonate solution containing glucose and bovine serum albumin and interval from recovery (in Ames) to transfer (in Sullivan) was 4 to 10 hours.

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Results and Discussion

Thirty seven of the 38 donor sows had stable or declining serum neutralizing antibody titers to PRV before embryo recovery. The recipient of embryos from the exceptional sow was isolated from the other recipients as a precaution but neither she, nor any of the other 33 recipients showed clinical signs of pseudorabies or had serum titers at 2 and 5 weeks after transfer. In addition, none of the pigs farrowed had serum titers for pseudorabies.

In total 805 embryos were transferred to the 34 recipients, 22 of which farrowed (65%). A total of 208 pigs was farrowed (189 live) and costs per pig were somewhat less than for conventional (cesarean section) procedures. In addition, several of the donor sows produced more embryos after being re-mated at subsequent heats. These results and previous experience indicates embryo transfer is a practical repopulation procedure for PRV infected herds.

We don't know why it is possible to transmit PRV in experimental studies but to date, no transmittance has occurred in practical application. It is possible that the large amount of PRV used in experimental studies is much greater than that encountered in practice. Also, it may be wise to screen potential donors prior to surgery and use only those with stable titers since they may be less likely to have PRV in their uterus.

In any event, it is a wise and practical procedure to quarantine recipient females until they have demonstrated negative PRV titers.

Conclusion

Based on these results and previous experience, we conclude that embryo transfer is an effective and practical repopulation procedure for PRV infected herds.