

Effect of AI Technique and Semen Handling on Dairy Cattle Fertility

Dr. Gustavo Schuenemann
Extension Dairy Veterinarian
The Ohio State University

Artificial insemination (AI) is a widely accepted technique in the dairy industry. Accurate animal identification, semen handling, hygiene of the AI procedure, and site of semen deposition are paramount to achieve acceptable reproductive outcomes. Professional inseminators must review the procedure on a regular basis (e.g., monthly) to obtain consistent field results. In large dairy operations, where numerous cows are inseminated on a daily basis, AI technicians routinely thaw multiple straws of semen at the same time in order to timely inseminate cows. Simultaneous thawing of straws of semen could potentially compromise the semen quality, thus lowering reproductive performance. The recommended semen handling protocol includes: 1) thawing the straws in a water bath at 35°C for a minimum of 45 seconds, 2) drying the straws, 3) assembling the AI gun, and 4) depositing the semen into the uterine body. Inseminators should perform AI under appropriate hygiene procedures.

Semen handling: Dalton et al. (2004) evaluated the effects of simultaneous thawing of 4 straws of semen at once and the subsequent sequence of inseminations (1st, 2nd, 3rd, or 4th) on conception rate. The time elapsed between the initiation of the thawing process and the final seminal deposition on dairy cattle fertility was evaluated under field conditions. This study showed that the sequence of AI (from 1st to 4th AI) and the time elapsed from the initial thawing process to the 4th AI (~7 to 10 minutes) did not affect conception rate.

Cleanliness of the AI procedure: An appropriate and clean AI technique is recommended to optimize reproductive outcomes in dairy cows. However, the AI procedure (i.e., hygiene, site of semen deposition, semen handling, etc.) is often overlooked. Bas et al. (2009) evaluated the effectiveness of using protective AI cover sheaths (PS) to minimize vaginal contamination of the AI gun at the time of AI on pregnancies per AI (PAI) in dairy cows. In this study, nearly 1,000 services performed by the same AI technician in one commercial dairy farm were assessed. For first services postpartum, PAI did not differ between cows inseminated with or without the use of PS at the time of AI. However, PAI was increased for second or greater services in cows inseminated with the use of PS (43.8 ± 2.9%) compared to cows inseminated without the use of PS at the time of AI (32.3 ± 2.6%).

Implications: Results from these studies suggested that: 1) the use of PS at the time of AI improved reproductive outcomes in lactating dairy cows and 2) simultaneous thawing of 4 straws may not compromise fertility when semen is deposited into the uterine body within 10 minutes after thawing. Cleanliness of the whole AI procedure must become a top priority for professional AI technicians. To achieve consistent reproductive results over time, the AI procedure should not be compromised for convenience.

References

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