

THE QUALITY OF ARTIFICIAL INSEMINATION: ARE YOU DOING A GOOD JOB?

BY: DR. ALEX SOUZA, PH.D., REPRODUCTION FIELD SPECIALIST

As we all know conception rates of high producing dairy cattle are decreasing throughout the years. Several complex physiological and environmental factors might be implicated in this multifaceted fertility problem. However, as described by several preliminary and very recent research articles, part of this lower fertility is probably related with basic human errors during the artificial insemination (A.I.) procedure.

Thus, in this report I am going to highlight a couple critical mistakes that our ReproConnections Team keeps seeing in A.I. practice conducted in the field. Interestingly, the mistakes that will be emphasized in this article are less frequent when a person is beginning to use A.I. Usually the mistakes are performed by people experienced in the A.I. technique. It is also worth mentioning that some of these mistakes or so to speak 'bad habits' during A.I. are caused by some limitations in the breeding facilities.

PROBLEMS OR 'BAD HABITS' DURING A.I. PRACTICE COMMONLY ACQUIRED BY EXPERIENCED ON-FARM A.I. TECHNICIANS IN DAIRY FARMS THAT HAVE HEADLOCKS:



Headlocks can save a great deal of time when we need to find cows in the breeding pen of a free-stall facility – no question about that. However, one common 'bad habit' during the A.I. routine happens just because we can get all the cows locked up at the same time and that is loading excessive numbers of A.I. guns simultaneously. For instance, I've seen inexperienced farm employees loading several A.I. guns at once!

So why will loading too many A.I. guns at once reduce breeding fertility results? This

issue has been studied by several research groups and the most likely reasons are related with the inconsistent straw thawing and longer intervals from loading the A.I. gun until semen placement in the uterine tract of the cow. This problem is exacerbated in large herds using timed A.I. protocols, where several cows must be bred on the same day.

The inconsistency in semen thawing mostly occurs when multiple semen straws are thawed at the same time without the proper attention to details. Thus, if multiple semen straws touch each other (straw-to-straw contact) or if the temperature fluctuates during the thawing procedure due to the larger amount of straws being thawed at once, the increase in the thawing temperature curve inside the semen straw will almost certainly be inconsistent. This can damage the sperm cell and reduce percentage of viable sperm cells per straw (Brown et al., 1991), which will probably lower conception success. This is even more critical if you are dealing with sexed sorted semen straws. It is also a good idea to change the water at least twice a week and to check the water temperature in the thawing unit regularly using two different thermometers.

The second reason to this question is due to the excessive time it takes to place the semen in the uterine tract once the A.I. gun is loaded. This is a major concern in extreme weather conditions such as in cooler seasons in Northern states in U.S., where many times it can be difficult to maintain adequate thermal protection following A.I. gun assembly – poor thermal protection after thawing can decrease the number of viable sperm cells in the straw (Kaproth et al., 2002).

Even though there is some contradictory findings about the number of straws that can be thawed at once (Lee et al., 1997; Goodell et al., 2000; Kaproth et al., 2002; Dalton et al., 2004), most of the research groups agree that the maximum time elapsed from loading the A.I. gun until placing the semen in the uterine tract of the cow should not be more than 10 minutes - if adequate thermal protection is provided. Thus, to

avoid inconsistent conception outcomes, make sure that all A.I. guns are being loaded and the semen is being hygienically placed in all cows, with no rush, with adequate thermal protection and within 10 minutes after thawing. Using an A.I. gun warmer is an effective tool to avoid cold shock and will keep the semen loaded in the guns the appropriate temperature prior to it being placed in a cow.

Large A.I. herds are encouraged to use adapted carts or vehicles containing a water bath and all the materials required to perform A.I. in order to decrease the interval from loading A.I. gun to the actual breeding, as shown below.



John Merrill, District Sales Manager, stands by one of his customer's A.I. carts that he regularly fills with semen. A.I. carts like this one assist larger herds in being able to get the thawed semen into cows quickly.

CHALLENGES FOR ON-FARM A.I. TECHNICIANS ON DAIRY FARMS THAT DO NOT HAVE HEADLOCKS:

Some positive aspects of not having headlocks on a well managed dairy are associated with cow comfort and time budget issues such as improved laying time, etc. However, have you tried to breed a cow that is running loose? I have and I can tell you that it can be really frustrating sometimes! Particularly if the pen is lacking end gates – it might take forever to make a cow stand in the bed and get her bred. It can be even worse if the cow that you need to breed is in the first lactation cow pen – they are generally more nervous and definitely faster than us!

Therefore, it is highly recommended that the person breeding cows seek help from a