

Artificial Insemination –vs- Natural Service in Dairy Herds

I am aware of three Cache County dairymen who have been injured by dairy bulls in recent weeks. It is a “crushing experience” for a 200 pound man to wrestle with a 2000 pound bull. All three of my friends could have easily lost their lives. They will spend the rest of the summer nursing painful injuries.

One of the major advantages of artificial insemination (AI) is the elimination of the costs and dangers of maintaining a bull on the farm. The use of AI has cumulative beneficial effects on a dairy because of the opportunity of choosing sires that are proven to transmit superior genetic traits. The risk of spreading sexually transmitted diseases or genetic defects is also minimized when AI is practiced on a dairy farm.

The dairy industry has benefited greatly by the use of artificial insemination, not because AI is a panacea that works like magic, but because of the very rigorous selection of the bulls that are used before they are allowed into the AI lineup. The testing of the bulls prior to being used as semen donors is the foundation upon which the success of AI in milk production has been laid. Bull studs can almost guarantee an improvement in body type and levels of milk production in female offspring sired by AI bulls. National increases in milk production per cow is directly associated with the use of artificial insemination in dairy herds.

One of the most important factors affecting acceptable levels of reproductive performance on dairies is efficient and accurate estrous detection. As herd size increases, problems with estrous detection become even more important. As such, many dairy farmers use natural service (NS) sires to overcome problems associated with estrous detection. Some dairy producers, using predominantly NS sires, argue they can still maintain genetic balance within their herds and improve conception rates by using bulls purchased from progressive breeders.

A recent national survey indicated that 54.9% of dairy farms used NS as a component of the breeding program. Several studies have compared the reproductive efficiency of cows using AI vs NS. In one study, greater conception rates were reported when cows were bred alternately by AI or NS. In another study, however, first service conception rates to AI and NS were not different under similar conditions. Some studies showed pregnancy rates of cows bred by AI or NS were not different, but pregnancy rates to NS were more variable. Calving intervals between paired cows inseminated by AI or NS were similar until year 3 of the study when the calving interval of the AI cows was shorter.

Despite the widespread popularity of artificial insemination, many dairymen still prefer the use of natural service sires due to a variety of reasons, including a common perception that it is easier to manage and less expensive than AI. Little has been done to estimate the explicit and implicit costs, including the probable loss of genetic progress associated with the use of natural service sires in dairy herds.

Researchers at the University of California, Davis, recently created a partial budget approach to stochastically model the expected costs and returns of reproductive management options in large, western, Holstein dairies.

Option one was natural service sires managed using currently recommended approaches including breeding soundness evaluations, bull vaccination, and a rotational breeding system. Option two was an AI system using a modified Presync-Ovsynch timed AI program in conjunction with estrus detection and inseminations performed by a commercial route breeder. Stochastic variables in the model included the cost of the lactating ration and purchased bulls, as well as the value received for milk, market bulls, and net merit gains. All other variables were treated deterministically.

Under the model's assumptions, the use of natural service sires averaged approximately \$10 more in cost per cow per year as compared to an AI program. Sixty percent of the time, AI was less expensive than using bulls. However, there was wide variation in expected differences in cost between the two systems with net merit estimates having the largest impact, followed by prices received for milk sold and market bulls.

In my younger days, someone taught me about "the unpredictable mind of the animal". The explanation was that one never knows what any animal will do in a given situation. That concept alone, may make one wonder about the wisdom of keeping a bull on the dairy when AI options are so readily available.