Preparing for a Successful Artificial Insemination Service

Utilizing artificial insemination (AI) is a great tool to maximize the profitability of an operation through many avenues. The use of this technology can allow a producer access to genetically superior sires who will produce offspring that are more likely to perform at a higher level than calves sired by natural service sires when focus is placed on the same traits. A study by Rodgers and colleagues (2012) found that on average calves conceived through a timed AI service were 38.6 pounds heavier than calves resulting from natural service when the breeding seasons of both groups began the same day and similar criteria were used in the selection of both semen and natural service bulls. This result highlights the impact of the superior genetics that can be utilized through AI. However, utilizing AI will not only maximize calf performance, but if used correctly and in conjunction with other technologies, insemination can be completed within a span of a few days resulting in calves which are more similar in age than those born from a natural mating system. This should result in a more uniform calf crop that is more appealing and marketable to prospective buyers.

While some of the benefits of using AI have been highlighted, fertility in cattle is lowly heritable and therefore is heavily influenced by the environment. Due to the environmental impact, there are many factors to consider when setting up females for AI success. These factors include the status of females’ estrous cycles, semen quality, technician skill, and the quality of estrous synchronization and insemination timing.

It is vital to ensure females are prepared for the upcoming breeding season; if a female is not cycling, conception cannot occur making it one of the most important factors to consider. Heifers should have reached puberty and cows should be recovered and cycling again since their most recent calf. A pre-breeding exam can reveal if heifers are sexually mature and even provide evidence of previous cycles in the form of ovarian structures. As for cows, guaranteeing cows have an adequate amount of time for reproductive repair and cycle resumption can increase the likelihood of a successful insemination. On average the time required for uterine involution (decrease of uterine size and uterine repair) is 30 days, while it takes on average 50-60 days for a female to begin cycling again (Senger, 2012). If females calve late in the previous year, this time span will be shortened and insemination success can decrease. It is therefore critical that females are managed in a fashion to meet these important deadlines for puberty and cyclicity by the start of the breeding season.

In addition to reproductive condition, females should be managed to ensure an optimum body condition at the time of breeding. Thin cows may require more time after calving to begin cycling again and may have a significant impact on the conception rates of the AI service. Supplementing thin cows prior to breeding will increase the number of females cycling, will produce a more successful AI service, and aid in the maintenance of any pregnancies that do occur in those cows.

Once females are set up for success of insemination through reproductive and body condition, the process of the insemination protocol must be strategically planned. Unless females will be observed for a continuous 21 days and bred based on display of heats, the AI service would include an estrous synchronization protocol. Utilizing synchronization, the estrous cycle of females can be manipulated to maintain females in the same phase of the cycle. This allows for the coordination of females to come into heat (if reproductively sound) within a span of a few days. During this span, females will be observed for heat and then bred 12 hours after standing estrus. Chalks, paints, and patches can be used to aid in the identification of females showing heat. Walking through the group in the morning and in the evening, females who show evidence of being ridden in the form of smudged paint/chalk or a tripped heat patch should be removed and bred in the next group. To further concentrate labor, time and materials, a timed AI (TAI) program can be used which would eliminate the need for heat detecting as all females would be bred in a window of time on the same day.

Once an AI protocol is in place, an AI technician must be secured. An experienced technician can skillfully breed not only cows, but also heifers who have smaller cervixes and are generally harder to inseminate. Finding a technician who can inseminate correctly, quickly, and with minimal damage to the female would be ideal for an operation which places high importance on AI success. If breeding in large groups it is also likely additional help is needed for thawing straws of semen. Regardless of who is prepping the semen and AI guns, make sure this person is well trained and knowledgeable of the thawing process. Incorrectly thawing or inappropriate handling of the semen just prior to insemination can have a negative impact on its viability (Barth, 1993).

Properly planning the breeding season, specifically an AI service is vital for the success of a program. Conception and fertility in general is impacted by many different factors including, but not limited to female health and condition, semen quality, AI timing and technician skill if using the reproductive technology. Taking these factors into consideration and ensuring all conditions are as close to optimum as possible will help maximize the program’s success.

For more information or resources regarding breeding season, please visit or call the Cheyenne County Extension Office (785)332-3171.