

AI - is it for you?

Artificial Insemination Basics

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What is artificial insemination?

Artificial insemination (AI) is defined as the collection of sperm from a male and placing it in the uterus of an in estrus female. This is commonly done in several species of animals and in man. AI was first performed on cattle in the United States in 1937. This procedure grew rapidly so that approximately two thirds of the 11 million dairy cattle in the U.S. are artificially inseminated presently. In many countries, nearly 100% of dairy cattle are inseminated artificially.

Why use AI?

The advantages of AI are: 1) If a bull is available that will sire offspring that are totally superior, then his semen can be divided into approximately 700 straws capable of causing about 60% pregnancies each week. Some dairy sires have sired between 100,000 and 200,000 calves in a lifetime. 2) Bulls can be selected more carefully and tried to see if they sire high quality calves - then if they do, they can be used on a large number of females. 3) Semen can be frozen and stored in liquid nitrogen tanks and used years after the sire is dead.

What percent of cows bred AI will conceive?

A 60% conception rate is common for experienced inseminators. This is about the same as if the cow was mated with a bull naturally.

Who can inseminate?

The procedure for AI is relatively easy. Many schools are held several times a year to teach the procedure. The schools are usually three days in length. The person going to the school then needs to use the knowledge gained as soon and as often as possible to fine tune his skills. If you do not wish to AI cows yourself, you can usually hire a neighbor to do it for you or a local veterinarian. Call your vet for details about local AI units or about schools.

What equipment is needed?

Semen can be purchased at almost any artificial inseminating unit. Usually you can rent a nitrogen tank until you find you need to buy one. The equipment for insemination costs from \$100 to \$400. It consists of a carrying case, a syringe or Kazoo gun, a container of sterile straws or sheaths that are sterile, an instrument to cut the top off the inseminating straw, forceps to grasp the frozen straw from the nitrogen tank and a hot water bath to thaw frozen semen.

Is AI practical for beef cattle?

I had a purebred herd of cattle and purchased semen from a sire that had sold to a bull stud for \$500,000. The semen costs only \$20. The calf from that mating brought \$2000. If you have good cows and can purchase semen from famous bulls that have all the qualities you want, then the results are usually profitable. You must also have marketing expertise.

If you are going to use artificial insemination for a genetic improvement program, it is necessary to have a well thought out plan in mind. ■

Is A.I. For You?

Before answering this question, a producer needs to find out what is encompassed in the big picture of artificial breeding versus natural mating. An Artificial Insemination (AI) program involves much more than just placing semen in the uterus of a cow in heat; it requires intensified management practices and knowledge of the "essentials" that, when managed properly, contribute to the success of an artificial insemination program.

Penciling out the costs and weighing them against the benefits can help you decide if AI can work in your operation. The National Association of Animal Breeders (NAAB) points out the following advantages and requirements of artificial breeding programs.

Advantages of AI

- The primary reward with AI is that it allows you to use outstanding bulls, likely some of the best the industry offers; access to the bulls is generally at moderate prices.
- Goals will be achieved as quickly as is currently possible in beef cattle breeding.
- Working hand in hand with AI are today's advanced sire evaluations which give you reliable statistics that identify bulls superior in important economic traits. Using the evaluations and AI, your ability to produce seedstock for specific purposes is enhanced appreciably.
- Experts have a vested interest in your success. Your AI supplier is available to help you with your program. AI organizations are going to stay in business only if they provide their clients with the best available genetics and help them use those genetics to their best advantage.
- You can sample and use any number of bulls.
- If you only have a few cows, you have as great a selection of genetics as someone with 1,000 cows.
- You can match each cow to a different bull if you want.
- If you refer to a sire summary in your selection, you can breed heifers to bulls known to reduce the risk of calving problems.
- AI gives you access to well-promoted sires. If one of them matches your specifications and you use him, you can take advantage of the sire's name to help sell the offspring.
- Using top bulls will result in top replacement heifers. You won't have to buy them, and many AI users have a good market for their extra heifers.
- You don't have to keep a bull around all year.
- Even if you consider increased labor for heat detection and insemination, it's often cheaper to buy semen than to keep a bull.
- Your calving season will likely be shorter. You'll get a more uniform calf crop and save on labor.
- When you buy semen from a reputable supplier, AI is one of the first lines of defense in disease prevention. Reputable organizations follow exacting standards concerning bull health and semen collection, processing and storage. The AI industry is self-governed and has a very impressive track record.
- AI helps you identify fertility problems quicker.
- AI forces you to keep records. Among other things, better records improve your replacement heifer selection and records can be effectively used in merchandising.
- Heifer management is simplified. Heifers of varying ages and sizes can be pastured together with no danger of them getting bred too early.
- AI eliminates the need for several breeding pastures.
- You have options. You can use AI for one heat period, then use natural service; you can synchronize; or you can AI for two heat periods.
- Advanced technology like embryo transfer is practical because of AI.
- AI encourages improved management. There's no sense committing the labor and resources if you're not going to do it right.

Requirements of AI

- Cows must be in good condition and a high percentage of them must be cycling normally or an AI program will not be successful. If more than 20 percent of your cows are open at the end of the breeding season or more than 50 percent of your calves are born after the first 40 days of the calving season, tighten up your management before you start an AI program.
- Your feeding program should be meeting your cow's nutrition needs.
- Trained personnel must be available to detect heat, to handle the cows, to care for the semen and to inseminate.
- Heat detection and insemination are time consuming and confining. They have to be done correctly and they have to be done on schedule.
- Cows must be identified.
- You must keep records.
- Facilities must be adequate to handle the cows with a minimum of stress.
- Cows need to be kept in compact areas during detection and insemination.
- AI training is a continuous process. Even if you've been to AI school, you will need periodic updating and retraining.
- You may need to buy a semen tank and supplies. You should plan on 1.5 straws of semen per cow you intend to breed AI, and you will need to select your semen supplier carefully.
- Semen must be carefully chosen to compliment the cow. AI calves are worth no more than natural calves unless superior sires are used.
- Merchandising is even more important with AI. It's up to you to let potential buyers know you have a superior product.
- A successful AI program requires a positive attitude.
- The success or failure of any AI program is up to the person

managing it. For those who make the commitment, the rewards make the effort profitable. One study comparing AI programs showed that conception rates varied from 25 percent to 100 percent. The difference was management. ■

Heat Detection Important

A good AI program begins with good heat detection methods. It is one of the single most important parts of artificial insemination because a bull is not available to interpret a cow's heat signals. The task of heat detection is not hard, but it is time consuming, requires regular attention and a practiced eye.

Heat, or estrus, is simply the period of time when a cow or heifer is sexually receptive, when an egg has been released and is ready to be fertilized. It normally occurs every 18 to 24 days until conception. Early signs and late signs that show a cow is coming into heat and going out of heat are often misinterpreted as heat. The surest sign of heat, however, is when the cow or heifer stands to be mounted. This is called standing heat.

Females are in standing heat an average of 18 hours. Cows usually ovulate 25 to 30 hours after first standing to be ridden and the life of an egg, once released, is six to 10 hours. Females traditionally have been inseminated 12 hours after first being observed in standing heat. Those standing in the morning are bred that night, those standing in the evening are held over and bred first thing in the morning.

Research has shown that the ideal times to observe for heat are early in the morning and late in the evening. Data collected at the Meat Animal Research Center (MARC) in Nebraska showed that when cows were checked only in the morning, 58 percent were spotted in heat. When the daily check was only at noon, 28 percent were found, and when checked only in the evening, 49 percent were in heat. With two checks, one first thing in the morning and the

other in the late evening, 94 percent of cows were detected in heat.

Secondary signs that alert producers a cow is near a heat period may include an increase in nervousness, motor activity, temperature, socialization and bawling, and mounting, mucous discharge, swelling and reddening of the vulva, tail switching and chin resting. Anytime a cow is inseminated during these signs and has not been observed standing to be mounted, a guess is being made about heat. AI success rates go down when heats are missed by managers and when cows that are not in heat are inseminated.

Records go hand-in-hand with good heat detection methods and prove how good the job is being done. Accurate information compiled and written on heat expectancy charts can help anticipate when cows are most likely to come into heat.

Heat detection aids come in handy, but a producer must remember they don't take the place of careful observation. Some of these include the chin ball marker worn by detector animals, altered bulls that are unable to breed, females injected with testosterone, testosterone-treated steers and the KaMar Heat Mount Detector. ■

TLBAA AI Requirements

Of the 57,862 bulls registered with the TLBAA, only 477 have been AI certified to date. AI Certificate #1 belongs to Texas Ranger JP. Bred and owned by Jack Phillips, Battle Island Ranch, West Columbia, TX, the bull was certified in December, 1972.

Application for certification of a bull as a TLBAA AI Certified Sire are made on TLBAA forms which contain, but is not limited to: TLBAA registered name and number of bull, private herd number, ownership brand on bull, and owner's name and address. Results of the following health tests are required: brucellosis, tuberculosis, 5 leptospirosis, vibriosis and trichomoniasis. Also required is a fertility test and a statement that no genetic defects have been observed in the bull or his progeny, if any. A complete health certificate is required as are the results of a bloodtyping test. (DNA tests accepted October 28, 1995.)

The applicant bull must be found to be genetically compatible with both his sire and dam. Parentage verification is done by comparing the bloodtype of the sire and dam to determine if they are genetically compatible. Each animal inherits one gene for each of the blood groups and protein types from each parent. One of the genetic rules used for parentage verification states that each of the blood group factors and protein types present in the blood of an animal must also be present in the blood of one or both parents. When one or both parents are excluded, the findings are considered irrefutable and will stand up in court. Bloodtyping tests disprove, but cannot prove parentage.

Texas Longhorn calves produced by artificial insemination (AI) may be registered in the Association herd registry only when done in compliance with the rules and regulations of the TLBAA.

Semen must be from a bull meeting TLBAA requirements for artificial insemination Sire Certification and properly registered in the Association herd registry. The use of preserved semen is permitted.

The breeding unit of semen must be clearly marked with the following: TLBAA registered name and number of the bull, private herd number, breed name (Texas Longhorn), name or code of the collecting station and date of collection. The application for registration of a calf sired using AI must be accompanied by a properly completed TLBAA Breeder Certificate. His number will be preceded by the letter "A".

For complete rules and regulations, see the official TLBAA Handbook. ■