

## **Artificial Insemination: Boon for Indian Dairy Industry**

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The technique of Artificial Insemination (AI) is particularly very useful in a country like India where the lack of quality males (sires) has been the main hurdle in the way of cattle improvement. It is the technique in which semen from elite males are collected and introduced into female reproductive tract artificially. AI is the method that holds the potential of economic and rapid dissemination of elite male genetic material to a large number of females in a short duration of time over a large geographical area. During AI, the semen is introduced into the female reproductive tract (cervix or uterus) by mechanical method with the aid of AI gun under hygienic conditions. However, success of AI technology depends largely upon accurate heat detection, timely insemination and a certification about the optimum fertility status of bull. Use of AI technology is still more generally associated with dairy cattle and buffaloes than in other domesticated livestock species in India. AI, as it is popularly called, has become a very popular tool for animal reproduction not only to bring out better breeds but also to serve those remote areas where either the bull cannot be maintained or such bull cannot be taken. With the help of artificial Insemination Karan Swiss and Karan Fries cross breed cattle were developed in India at the National Dairy Research Institute, Karnal. Karan Swiss is a high yielding cross between exotic cattle Brown Swiss and zebu cattle Sahiwal. However, cross between exotic cattle Holstein Friesian and zebu cattle Tharparkar, resulted into Karan Fries. The increased milk productions from these breeds have revolutionized Indian dairy industry.

Artificial insemination has proven to be very effective for the improvement of the genetic potential of animals for higher production and there is no surprise why today AI is back bone of all breeding programmes in India. In commercial dairy production, over 80% of all the cattle are now bred artificially. The success of dairy producers in improving milk production has been impressive. A large proportion of the success is due to improvement of the genetic potential of dairy cattle through use of outstanding sires by artificial insemination.

### Advantages of Artificial Insemination:

There are many advantages of artificial insemination in various kinds of livestock, only those that primarily apply to cattle are discussed below:

1. Use of AI makes possible to increase the number of calves from a bull by dividing the semen for multiple service. This is particularly important in the case of a valuable or proven bull and greatly enlarges his usefulness. It also will tend to prevent over-use of a valuable sire in a large herd.
2. It helps in preventing the spread of contagious diseases of the genital organs, such as trichomoniasis by contact from one female to another by means of the male. This becomes increasingly important when a male is used jointly by a number of breeders. The prevalence of trichomoniasis is worldwide and the losses resulting from it are enormous. Thus artificial insemination will prevent the spread of many such diseases.
3. A wider and rapid use of selected males through AI will accelerate the rate of genetic improvement.
4. AI makes possible the obtaining of semen from a proven bull that has little or no sexual desire or that is physically incapable of service.
5. The mating of animals of different sizes is possible without difficulty.
6. AI provides an easy way of determining the character of the semen sample before service since as a part of the procedure of AI the semen is usually examined for the activity and normality of the sperm. Thus any characteristics that the semen would tend to affect conception will be known before service.
7. The mating of cows over a wide geographical area becomes possible if it is possible to store semen for reasonably long periods.
8. AI increases the usefulness of superior sire. It makes available superior sires having inheritance for milk and butter fat production to all dairymen within a specified area. Previously only a few could get the advantage of good bulls.
9. The services of superior sires are greatly extended. By natural services, a bull can be bred to 50 to 60 cows per year. On the other hand, by artificial insemination technique thousands of cows can be sired in one year by one bull.
10. The dairy farmer does not need to maintain a herd sire and thus can avoid the expenditure on management of a bull.
11. The dairyman does not have the problem of searching and purchasing a new herd sire every two years to avoid inbreeding.
12. The technique of AI can be made useful in cross breeding for hybrid vigor by quickly transporting the semen by air to different continents.

13. Early detection of infertile bulls is possible by the use of AI technique.

Limitations of artificial insemination:

Despite a number of advantages over natural breeding processes, artificial insemination has certain limitations.

1. It requires well-trained operators and special equipments.
2. It necessitates the knowledge of structure and function of reproduction on the part of the operator.
3. Improper cleaning of the instruments and unhygienic conditions may lead to lower fertility.
4. Market for the bulls is reduced while that for the superior germplasm is increased.
5. Selection of the sire should be very rigid in all respect.
6. Preservation and transportation of semen is difficult under severe climatic conditions like those prevailing in most parts of India.
7. AI requires more labor and infrastructure facilities.

Thus, it can be concluded from the above discussion that, AI is very powerful and useful technique for increasing the productivity of indigenous animals but its use in judicious and efficient manner is necessary for the well being of the poor farmers in our country.

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