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Artificial Insemination
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C. L. Cole, Animal Husbandry
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ARTIFICIAL INSEMINATION

C. L. COLE*

The successful use of artificial insemination in continental European countries during recent years has resulted in increased interest in this method of breeding in the United States. The method has been used extensively and successfully by cooperative breeding organizations in Denmark.

The first organization established in Denmark bred 1,187 cows, belonging to 220 members during 1937. Most of these cows were bred with semen taken from one bull by means of an artificial vagina. Dr. K. A. F. Larsen, the inseminator in charge reports that the average number of inseminations per conception was 1.68, a rate slightly better than that obtained by natural service on other farms in the district.

In May 1938, the first large cooperative in the United States was organized in New Jersey. This organization was preceded by a small experimental unit in Minnesota, experimental insemination work in Missouri and Nebraska, and a considerable number of inseminations in private herds in Wisconsin.

Since 1938, organizations for the artificial insemination of cattle have sprung up in nearly every section of the United States. The increased interest in this method of breeding has led to a widespread demand on the part of farmers for the organization of breeding units.

This interest has been stimulated primarily by four factors:

1. The widespread use of material pertaining to insemination by the press.
2. The fact that many persons, regardless of previous experience have written popular articles on the subject.
3. The natural interest of people in a subject of this nature.
4. The natural interest which people have in new developments. Breeders, research workers, and extension workers who are interested in livestock developments are interested in artificial insemination as a means of more rapid livestock improvement. It is the hope of this group that this method of breeding may not be hampered by exploitation or by the application of technics, the efficiency of which have not been proven.

It is advisable that anyone employing this method of breeding be well informed as to both its advantages and its limitations.

ADVANTAGES

The following advantages of artificial insemination have been demonstrated in both experimental projects and practical animal breeding units:

1. The increased use of sires that have proven valuable.
2. Extending the use of proved sires that because of injury or other causes are unable to serve cows naturally.

*Section of Animal Husbandry.

MICHIGAN STATE COLLEGE
EXTENSION DIVISION
East Lansing

Cooperative Extension Work in Agriculture and Home Economics, Extension Service,
Michigan State College and the U. S. Department of Agriculture Cooperating.

3. Young sires may be used before they have reached sufficient size to mate naturally or to breed many cows. This fact can serve as an effective method of proving sires at an earlier age on a larger number of females than is possible with natural mating.
4. Under carefully controlled conditions it may serve as an effective disease control measure.
5. Extremely large sires can be used on immature or small females.
6. In an artificial insemination program, the poor breeding males and females are discovered much sooner and, consequently, less time is lost in the breeding program.
7. The expense, bother, and risk of keeping a bull on individual farms is reduced.

Other minor advantages have been attributed to artificial insemination, but it should be emphasized that all the advantages other than the first four mentioned are of minor importance to the practical livestock producer.

LIMITATIONS

Some of the limitations of artificial insemination, apart from the method of breeding itself, are:

1. The scarcity of sires of proved transmitting ability which may lead to the use of an inferior or unproved sire on a large scale.
2. The difficulty of obtaining a highly trained technician to make the semen collections and the inseminations.
3. The lack of complete and accurate information relative to sperm preservation.
4. The lack of information relative to the frequency of semen collection. Little information is known regarding the number of collections that can be made from any one bull in a given period of time.
5. The lack of information as to the effects of continued use of an artificial vagina or continued massage of the ampullae.
6. Commercial exploitation of artificial insemination by unscrupulous or misinformed individuals offers a remunerative field. Persons of this type may misuse these services by disseminating inferior sperm or spreading disease.
7. Widespread use of artificial insemination will reduce the number of young bulls in service and consequently decrease the number of sires proved each year.
8. The distance that it is necessary to travel within a unit and the consequent higher costs of breeding.

While artificial insemination is a promising and frequently a very useful tool for livestock breeders, it is necessary to emphasize that it should be used only by persons who have the proper technical training, and thorough appreciation of the necessity for sanitary precautions.

METHODS OF APPLICATION

Artificial insemination is being used under two main conditions:

1. In private herds where a large number of females are bred each year within the herd or by the sale of semen.
2. In cooperative organizations composed of a large number of individual herds:
 - a. The cooperative owns the bulls and hires a technician.
 - b. The cooperative buys semen and service from a technician.

In the first instance there seem to be no particular hazards involved. The private owners are usually careful to exercise necessary precautions, and in a great many instances the use of artificial insemination has been useful to them. It has helped to increase breeding efficiency in some herds. It has spread the use of a good sire over the entire herd, has enabled the use of crippled and injured bulls, and has brought about conception in some apparently sterile cows.

The second method of use has brought about many problems. A cooperative organization needs to be so located that the owners of from 600 to 1,000 cows may band together in one organization for artificial insemination. This fact indicates that areas thickly populated with cows fit into the program to the best advantage. To obtain the best results, the cooperative should be closely associated with a production testing program. It will be difficult to measure future results if a coordinated program between the two is not worked out.

The technician should be well trained in two methods of semen collection: (a) by means of an artificial vagina; (b) and by massage of the ampullae. He should be familiar with the physiology and pathology of the reproductive tracts of both the bull and the cow. The technician should also be well informed on sanitary precautions concerning the animals involved, the equipment, the semen samples, and his own clothing and person. In addition, it is highly desirable that he be familiar with livestock in general.

SIRES

At the present time, one of the real hazards to the continued success of these organizations is the scarcity of proved sires of sufficient merit to warrant their use on a large scale. Since the primary motive of artificial insemination is to increase the use of good sires, it is not logical to use one of unknown or inferior merit, except in a limited way. No organization should, therefore, plan to proceed with actual breeding until desirable sires have been obtained. Since it is uncertain as to how long old proved sires will remain potent, it is advisable to have one or more young sires, carefully selected to be used in conjunction with the older one. These young bulls serve several purposes. They are available in case the older bull becomes temporarily or permanently impotent, they may be used during any period that services are especially heavy, and meanwhile their breeding ability can be determined without jeopardizing the future of entire herds. Furthermore, if the demand for artificial insemination units continues at its present rate it will be impossible to supply proved sires. It, therefore, appears that the associations must assume the responsibility of proving their own sires.

ORGANIZATION PROBLEMS

If any artificial insemination unit is to function properly over an extended period of time, it needs very careful and deliberate organization. Every member should be familiar with its limitations as well as its advantages.

The organizations in the United States that are now actively engaged in inseminating cows are experiencing some difficulties. It has been necessary to draw on experience to perfect the organizational set-up in some instances.

Occasionally an old sire has become impotent and has had to be replaced sooner than was anticipated.

In some instances, the technician has not proved satisfactory. Occasionally a member has become dissatisfied with the breeding efficiency in his herd and dropped out of the organization. All these problems are natural ones and can be expected in any new movement having such a wide scope. Many breeders have complained of the number of repeat services necessary to produce conceptions. They have honestly believed that the breeding efficiency of their herd was not so high as by natural service, but in many cases they had previously failed to keep a record of breeding dates.

On the average, where comparisons are available, the results from artificial insemination have been equal to those obtained by natural breeding methods. There is no longer a question as to whether it is possible to get cows "in calf" efficiently by artificial insemination. That particular phase of the program has been proved many times and if the techniques now recommended are properly observed, just as high breeding efficiency can be obtained as with natural service.

Many important problems remain for research workers to solve that will make large scale application more successful. However, there is sufficient information available at this time to insure success on a practical basis.

What the Program Offers

Cooperative artificial breeding units make it possible for the small herd owner to use a much better sire than he could hope to buy because his herd is not large enough to justify the purchase of an outstanding bull.

This method of breeding when properly conducted offers a progressive movement in cattle production. Merely the placement of sperm in the reproductive tract of cows does not mean constructive breeding. However, the placement of sperm of known quality into that same tract, regardless of the method, is constructive breeding. If the same quantity of sperm of high quality is used extensively, more rapid progress can be made.

In properly organized breeding units, other services such as sterility examinations and treatment and pregnancy examinations are duties of the technician, and many herds are put on a more economical breeding basis as a result.

One should not think of artificial insemination as an emergency measure for "getting cows in calf". It is not a cure-all for breeding ills; in fact, there may be some failures, but the advantages of the use of superior germ plasma are sufficient to offset many failures. The successful large-scale use of artificial insemination will depend on proper supervision and control. Specific control measures should provide for sanitation methods with regard to operators, instruments and animals. Sanitation cannot be stressed too strongly if the program is to operate successfully and be a disease-control measure. Control measures should also provide for the inspection and certification of all bulls used in breeding groups.

Indications are that improvement from this method of breeding can be expected if there is allowed a normal growth and expansion of the program that is consistent with the supply of superior sires available and if financially sound units are organized that are equipped to prove young bulls, control the spread of disease, and give the members services consistent with the price paid.