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Michigan State University Extension Service
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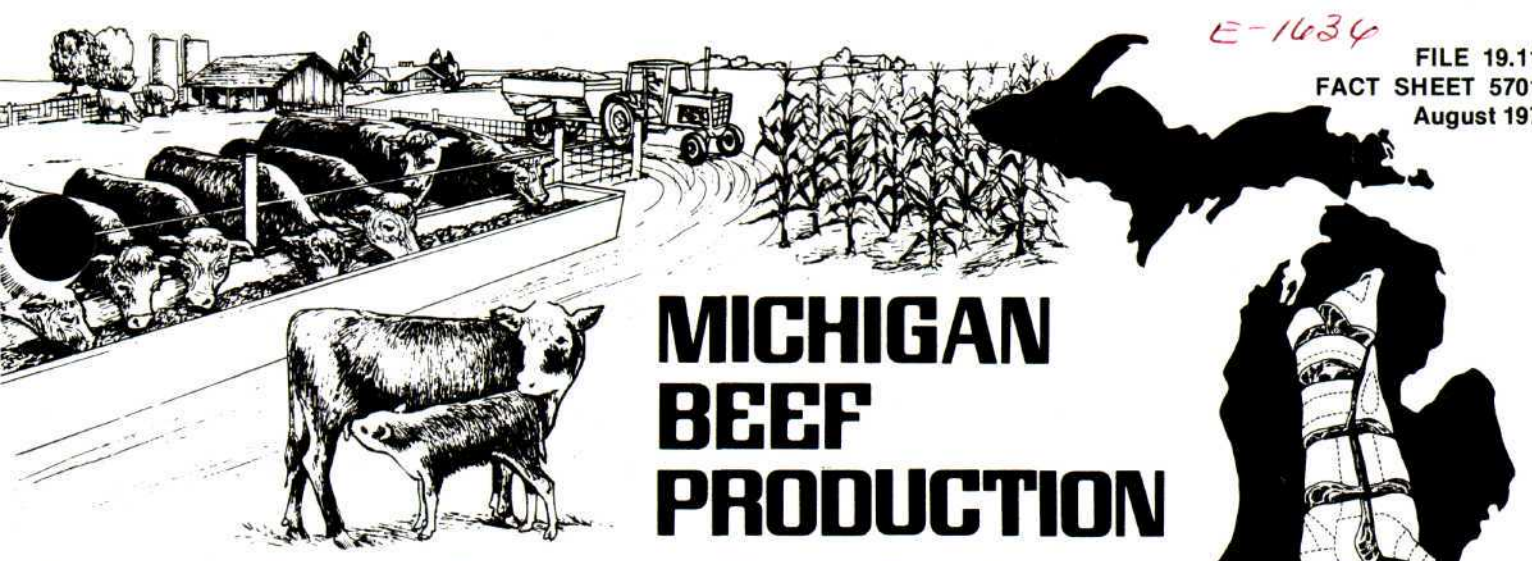

# MICHIGAN BEEF PRODUCTION

Cooperative Extension Service ⊰⊱ Michigan State University

# Management Techniques for a Successful Beef A.I. Program

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The development of artificial insemination has made genetically superior sires available to all breeders at a reasonable cost. However, the level of management required to utilize A.I. successfully must be intensified. Complete dedication on the part of everyone involved is necessary to insure satisfactory results. A number of factors which require additional attention over a pasture mating system are outlined below.

## Recordkeeping

Accurate records are important for successful A.I. Dates and times of observed estrus and breeding should be kept in a pocket recordbook and later tansferred to the herd's permanent records. Sires used will also need to be recorded. One advantage of A.I. is that actual breeding dates are known, which allows more accurate prediction of calving dates.

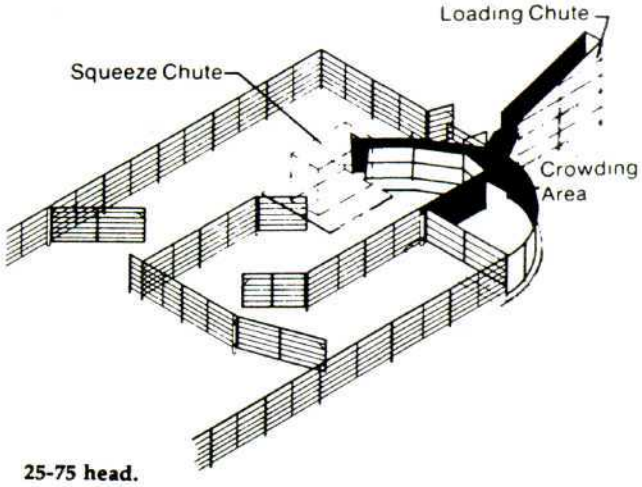
## Identification

Individual identification of all cows in the herd is essential. Ear tags are the most popular, of which there are several types that can be purchased reasonably. Freeze branding is another excellent means of identification. Whatever method is used, the numbers should be readable from a distance since heat will often be observed at a distance.

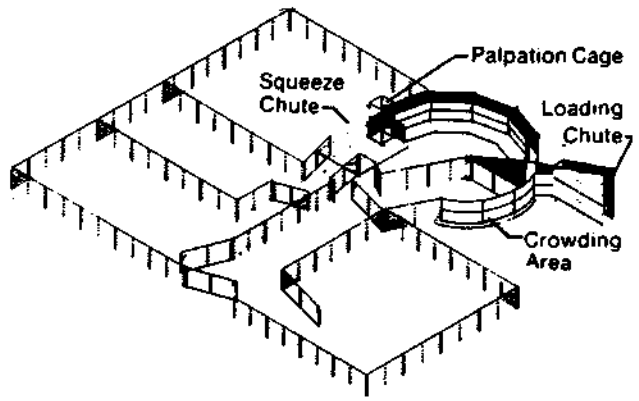
## Facilities

Adequate facilities are fundamental for a successful A.I. program. A good corral for sorting cows and a chute for restraining them are absolutely essential. Some breeders prefer a chute with no headgate since the cows remain calmer. Excitement can lead to reduced conception rates and this should be kept in mind when designing facilities.

Cattle tend to follow a curved path more easily than a straight one. With a curved chute, cattle cannot see the A.I. or squeeze chute until they are practically in it. Futhermore, a working alley should have high solid sides since this prevents cattle from seeing distractions outside. An example of small (25-75 head) and large (70-400 head) working corrals are shown in Figure 1.




**25-75 head.**




**70-400 head or more.**

**Fig. 1. Corrals with working facilities. USDA Plan No. 6230.**

When synchronized estrus becomes widely used, there will be a need for multiple A.I. chutes. An example of one such system is illustrated in Figure 2.

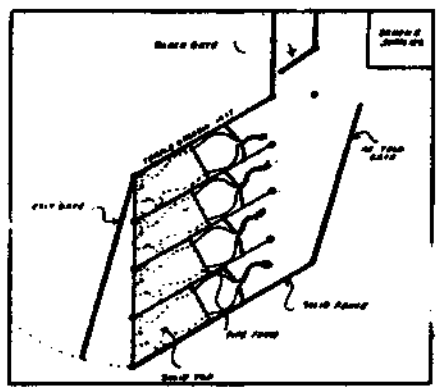


**Fig. 2. This herringbone layout can handle four cows at a time and requires no headgates.**

For additional facility plans, refer to *Beef Housing & Equipment Handbook* (1975), Midwest Plan service, Iowa State University, Ames, Iowa 50011.

## Short Calving Season

Another important ingredient of a successful A.I. program is a short calving season. This is necessary to insure that a high percentage of the herd will be in heat during the A.I. period. Due to the high labor requirements for A.I., it is popular among breeders to A.I. for a period of 3-4 weeks and then turn out cleanup bulls. To have 80% of the cow herd cycle during this 3-4 week period, a 60-day calving season or less is needed. A 60-day calving season allows for a majority of the cow herd to cycle during the A.I. period and thereby maximizes labor usage. Cleanup bulls can then be turned out to service cows not detected in heat or failing to settle to A.I. service. Realistically, approximately 50% of the herd can be settled by A.I. with this program.

## Competent Inseminator

Figure 3 shows the proper positioning of the A.I. pipette. The tip has just passed through the cervix and into the uterus. Manipulation of the cervix is required to

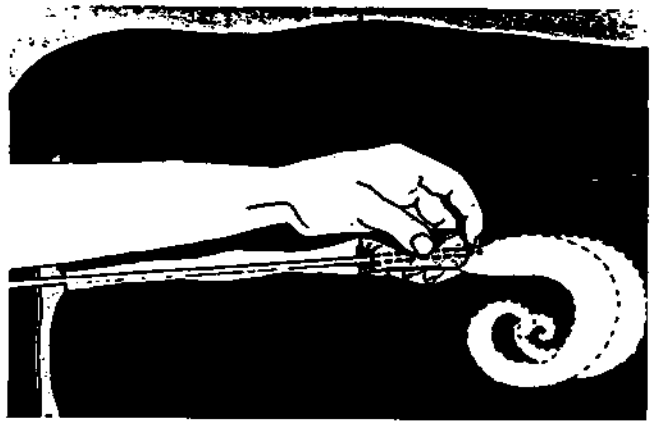


**Fig. 3. Proper positioning of pipette for artificial insemination.**

achieve correct positioning. Mastering this technique requires considerable skill and much practice. If semen is deposited in the wrong place by an incompetent inseminator, results will be disastrous regardless of how optimum all other factors may be. For the beginner, an A.I. training school is a must. Most commercial A.I. studs offer such schools.

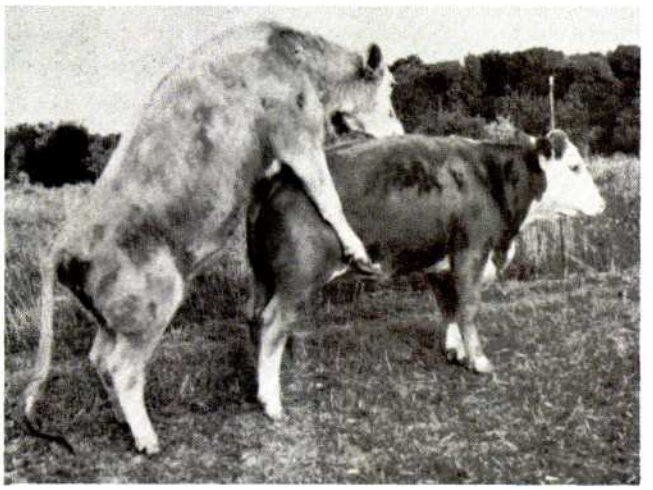
## Semen Quality

A recent slogan of the National Associaiton of Animal Breeders is: "Know your semen supplier." A person needs to be sure he is acquiring a quality product that is properly identified. Semen should be acquired a minimum of 10 days to 2 weeks before the scheduled start of the breeding season.

It is important to have correct equipment for the specific package containing the semen. Semen comes packaged in glass ampules and several different-sized plastic straws. The type of package has little effect on conception rates and it is generally a matter of personal preference as to which type is used. Thawing procedures differ for various packages, and improper techniques can reduce conception rates. Therefore, it is important to follow the thawing and handling instructions from the company that processed the semen.

## Heat Detection

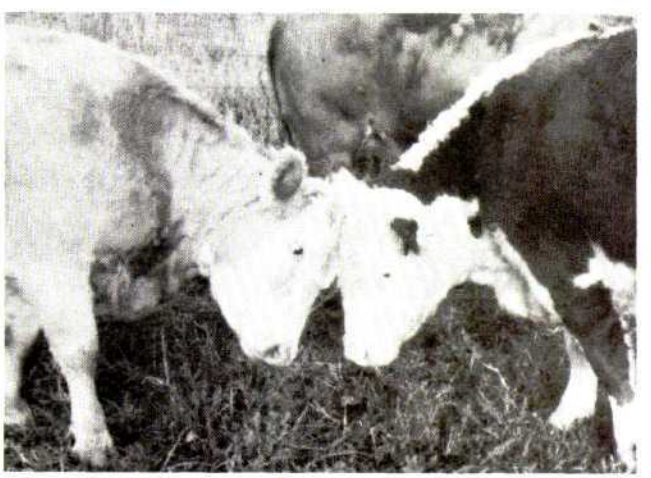
A keen-eyed cowman who understands cow behavior is instrumental in successful heat detection. The surest sign of estrus is when a cow stands to be ridden. However there are a number of other reliable indicators which can be of help in heat detection.



*The surest sign of heat is when a cow stands to be ridden.*

Due to an increase in the secretory capacity of the cervix and vagina at estrus, a thick, clear mucus will often be observed coming from the vulva or smeared on the rump or tail of the cow. The vulva may appear somewhat swollen with less wrinkles in it. The cow in heat may be restless and will often be seen walking the fence and bawling. She may try to ride other cattle that are not in heat. Cows seen butting heads are often coming into or going out of heat.

Frequently the tailhead of the cow in heat may appear to be higher than usual and the hair on it may be ruffled from being ridden. The hair on her sides may also be roughed up. While not being 100% accurate, observation of these additional signs of heat detection can certainly benefit an A.I. program.



*Butting heads is often an indication that a cow is coming into or going out of heat.*

The duration of standing heat is quite variable. Nearly one-fourth of all heats last 8 hours or less. About one-third last 16 hours or more. It is generally recommended that cows be observed at least twice daily, in the early morning and late evening. These times are particularly important during the summer because hot weather tends to suppress signs of estrus. This is evident in Table 1. A single observation at noon detected the lowest percent of heifers in heat. However, by observing the cattle in both the morning and evening, 94% were observed in heat.

**Table 1. Effect of Time and Frequency of Observation on the Percentage of Yearling Heifers Detected in Standing Heat[a]**

| Time of Observation | Percent of total detected |
|---|---|
| Noon | 28 |
| PM | 49 |
| AM | 58 |
| AM + PM | 94 |
| AM + Noon + PM | 100 |

[a]Adapted from Beerwinkle, 1974, Proc. Eighth Conf. A.I. Beef Cattle.

Figure 4 shows some of the indications of estrus and notes the best time to breed. The rule of thumb followed most frequently is that a cow observed in heat in the morning should be bred that evening. A cow observed in heat in the evening should be bred the following morning.

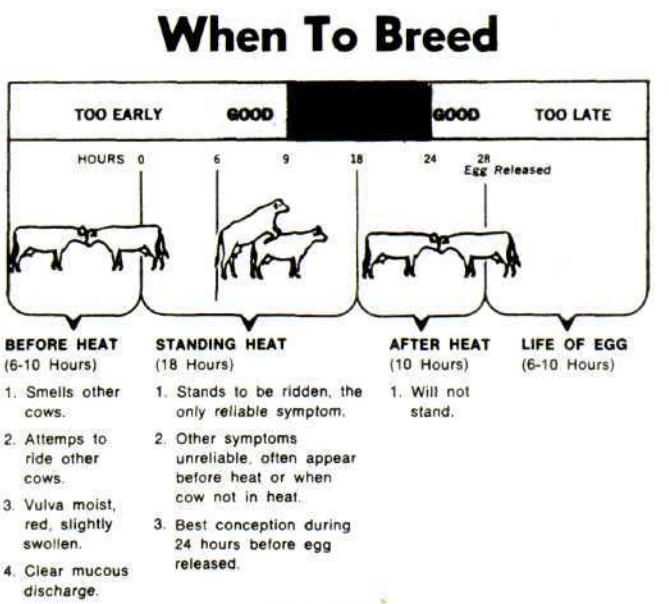



**Figure 4**

## Heat Detection Aids

Several aids have been developed to assist in heat detection. Pressure sensitive devices (KaMar™ Heat-

mount Detectors) are fitted to the tailhead area. When these cows are mounted, the pressure sensitive devices turn color. However, caution must be used because false readings can be obtained. For example, the devices can be activated if the cow rubs against a tree or back-rubber. They can also be activated if a cow is mounted when she is trapped between other cows at a feedbunk or in a corner.

Utilization of heat detector animals has become popular in recent years. Bulls, altered so they cannot settle cows, and hormone-treated steers or cows can be utilized. These animals are usually equipped with chin-ball marking devices (Fig. 5), which leave a mark on the back or rump of the cow in heat as the detector animal dismounts.

**Fig. 5. Chin-ball marker on a surgically-altered bull.**

Methods of altering bulls include surgically removing the penis or suturing the penis to the sheath. Bulls can be vasectomized which renders them sterile but still allows sexual contact with cows and could be a means of spreading disease. A Pen-O-Block™ is a device inserted into the sheath which prevents extension of the penis. However, there is some danger of accidental removal and the sheath can become infected with the Pen-O-Block™. Steers or cows can be injected with testosterone to induce ounting behavior. Procedures for preparing hormone-treated detector animals are given in Table 2.

Problems with marker animals include riding the same cow in heat all day while other cows go unnoticed. Further, cows can be marked when not in heat, particularly if the herd is kept in close confinement. Although heat detection aids can be helpful, there is no substitute for a skilled herdsman with the proper attitude. Modern innovations cannot compensate for poor management.

**Table 2. Preparation of Heat Detector ("Gomer") Steers and Females[a]**

**Gomer Steers**

Day 1: 1 ml of Duoval™ (90 mg. testosterone enanthate + 4 mg estradiol valerate per ml.) injected in the muscle.

Day 2: 2 ml. of Duoval™ in the muscle.

Day 3: 1 ml. of Duoval™ in the muscle.

Day 7: 1 ml. of Duoval™ in the muscle.

Day 10: 8 ml. of Repotest™ (25 mg. testosterone propionate per ml.) injected in the muscle. This is a total of 8 × 25 = 200 mg. of t. propionate.

Day 11: Turn out with cow herd after being fitted with chin-ball marker (about 30 cows per detector steer).

Every 2 weeks thereafter: 1 ml. of Duoval™ in the muscle and 4 ml. of testosterone enanthate in corn oil (50 mg. per ml.) injected subcutaneously. This is a total of 4 × 50 = 200 mg of t. enanthate each time.

**Gomer Cows**

1. Every other day for 20 days: 8 ml of Repotest™ (25 mg. testosterone propionate per ml.) injected in the muscle. This is 8 × 25 = 200 mg. of t. propionate each time or a total of 10 × 200 = 2000 mg. over the 20-day period.
2. Beginning 5 days after last testosterone propionate injection, inject 500 mg. of testosterone enanthate subcutaneously every 2 weeks during breeding season. For this purpose, dissolve 50 mg. of t. enenthate per ml. of corn oil and inject 10 ml. of this solution subcutaneously every 2 weeks.
3. Before being turned out with the cow herd, fit each detector female with a chin-ball marker. Turn out approximately 1 detector cow per 30 breeding cows.

[a]Adapted from Ritchie, H.D. and D.L. Nielsen, 1978. Michigan Agr. Exp. Sta. Rep. of Beef Cattle Res. 353. p. 38-40.