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THE RIGHT TIME TO BREED CATTLE



Cooperative Extension Service
South Dakota State University
U.S. Department of Agriculture



THE RIGHT TIME TO BREED CATTLE

George Heersche, Jr.
Extension Dairyman

The time a cow is bred in relation to standing heat influences conception. The best time to breed her is at the end of standing heat. Unfortunately, you usually don't know when heat starts or ends. All you may be able to say is, "she wasn't in heat at 5 am but she is at 5 pm."

Use two guidelines when determining when to breed: (1) the time the cow was first seen in standing heat, and (2) how many hours have elapsed since she was last observed.

If a cow wasn't in heat at 5 am but was at 5 pm the only thing known is that standing heat started some time less than 12 hours ago. She could have been in heat 1 hour or 11 hours. The general recommendation (in heat in the morning, breed that evening; in heat in the evening, breed the next morning) will result in good conception.

The ideal time to breed would be 8 to 9 hours after the cow was first seen in standing heat (Table 1) or between 1 am and 2 am the next day. Obviously this isn't a convenient time; therefore this table must be used as a guideline. Chances of conception would be higher if this particular cow was bred after the late news or before the next day's morning milking, compared to breeding her after morning chores or at noon.

Table 1. The time to breed cattle for optimum conception considering different intervals of observing for heat.

Number of hours between time cows were last observed, and time first seen in standing heat	Breed this many hours later	
3	9-17 ¹	(12) ²
6	9-14	(10.5)
9	9-11	(10)
12	8-9	(8.5)
15	7	(7)
18	5-6	(5.5)

¹ For optimum conception, breed this many hours after first seen in standing heat.

² Number of hours later indicated by parentheses is the ideal time to breed.

Good conception has resulted when experienced A.I. technicians visit farms once a day. Technicians breed thousands of cows, and they do not commit as many errors in technique as the man who

breeds a few cows each week. Proper timing of insemination is the "ace in the hole" for the man breeding his own cows. He can breed close to the ideal time, commit some technique errors, and still enjoy conception rates equal to those achieved by the professional technician who cannot afford the luxury of breeding cows at the ideal time.

Frequent observation for heat is to your advantage because it gives more leeway in timing of insemination, and you will also see more cows in heat. Each day cows should be watched for heat at least three times, not including times for milking and feeding. Learning the following external signs of standing heat will help you.

- 1) The cow in heat stands when mounted by other cows.
- 2) The cow in heat may mount other cows or try to get them to mount her, particularly when coming into or going out of heat.
- 3) The cow in heat may raise her tail, roam and/or bawl, and hair may be roughened on the rump.
- 4) Mucus will be seen on the vulva and tail.
- 5) The vulva will be swollen, large, moist, and smooth compared to when she is not in heat.
- 6) Her milk production and feed consumption may go down, and her "normal" behavior might change.
- 7) Bright red blood may be discharged 12 to 48 hours after the cow has gone out of heat. This bloody discharge only



means that the cow was in heat, and not that she is pregnant or open. Start watching for the next heat 18 days after blood is observed.

Why there is a best time to breed

Several events occur during and after standing heat. They happen in sequence and are closely related in time. Understanding these events and their sequence is the key to understanding why correct insemination timing will increase conception. Figure 1 shows the interrelationship of these events.

Start of standing heat. At this time there is a large follicle on one ovary which contains the egg or ovum. This

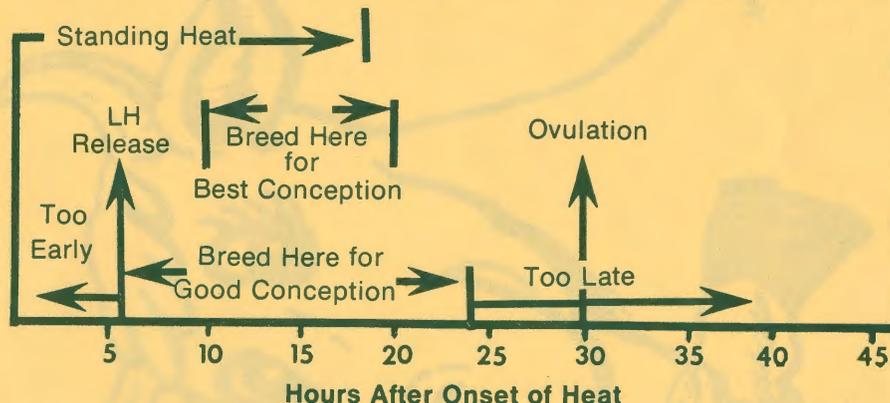


Figure 1. When to breed in relation to standing heat and ovulation.

follicle is producing estrogen, the female sex hormone. When the estrogen level in the blood gets high enough, the cow stands to be mounted or is in standing heat. Estrogen also causes the vulva to swell, the cervix to secrete mucus, and the muscles in the uterus to become tense. Length of standing heat varies from cow to cow, but averages 14 to 18 hours.

Release of luteinizing hormone (LH). Luteinizing hormone is produced in the pituitary gland under the brain. It is released into the blood about 3 to 6 hours after the start of standing heat, and causes the follicle to break.

Ovulation. Ovulation occurs when the follicle breaks. The egg (ovum) is released into the upper part of the reproductive tract (oviduct) where it comes in contact with sperm. Ovulation occurs about 30 hours after the start of standing heat and 24 or more hours after the release of LH.

Sperm capacitation and livability. Capacitation is the change that sperm must undergo in the female reproductive

tract (uterus) before they are able to fertilize the egg. Capacitation takes 6 to 7 hours. Sperm will live for at least 24 hours in the female reproductive tract, and the egg lives for about 6 hours.

Fertilization. Fertilization takes place when one live capacitated sperm penetrates the egg. If the fertilized egg continues to develop, the cow is pregnant.

Putting it together. The goal of all of these events is fertilization. Chances of fertilization are greatest when capacitated live sperm are in the upper part of the reproductive tract when the egg is released from the follicle. Sperm must be in the uterus at least 6 hours to be capacitated, and not longer than 24 hours to be alive. Ovulation occurs 30 hours after the start of standing heat, so only cows that are bred 6 to 24 hours after start of standing heat have a chance of conceiving. Optimum chance of conception will result if cows are bred 10 to 20 hours after the start of standing heat, or a few hours before or after the end of standing heat (Figure 1).

The sequence and timing of events discussed above are as they occur in the

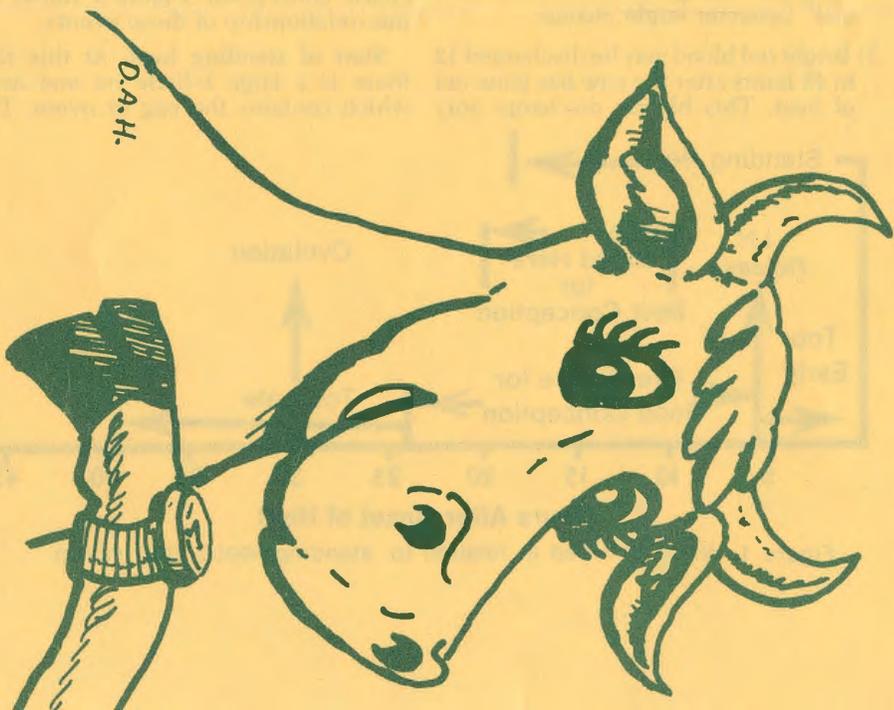
“average cow.” All cows do not stay in heat for the same length of time or ovulate at exactly the same number of hours after onset of heat. Special considerations must be made when cows are not “normal.” For example, late ovulating cows should be bred later than normal cows.

Summary

Chances of conception are best if cows are bred between 10 to 20 hours after the start of standing heat, or a few hours before or after the end of standing heat. Under practical management conditions the start or end of standing heat is not known and you must estimate the best time to inseminate.

If cows are checked for heat every 3, 6, 9, 12, 15 or 18 hours the respective best times to breed are 12, 10 to 11, 10, 8 to 9, 7 and 5 to 6 hours after the cow is first seen in standing heat. Breeding at these times will result in better conception than following the general recommendation, “in heat in the morning, breed that evening; in heat in the evening, breed the next morning.”

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