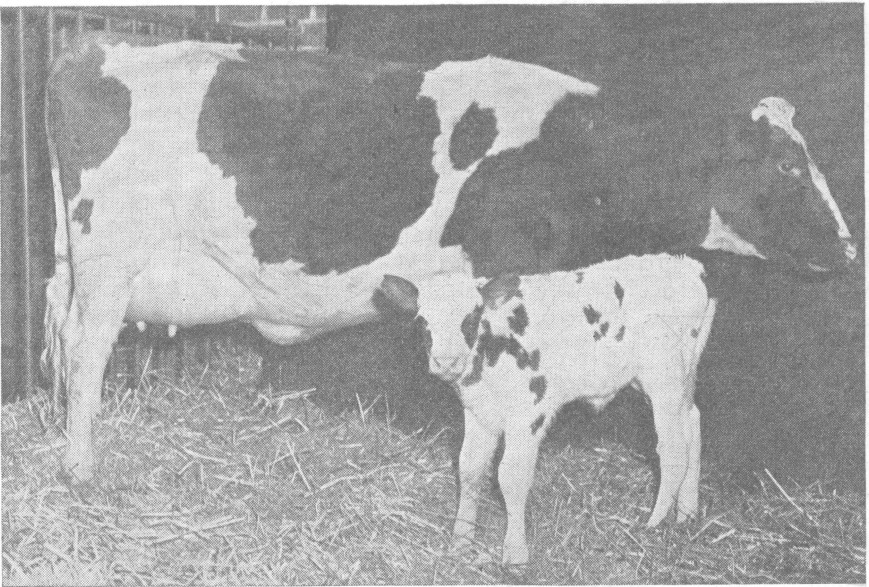
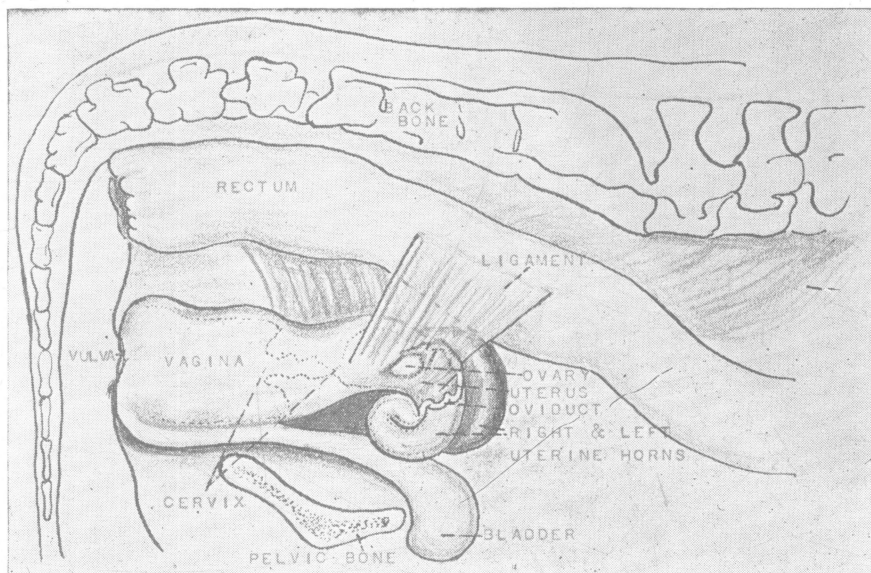


REPRODUCTION of DAIRY CATTLE

By J. L. STANSBURY, D.V.M.
Former Extension Dairy Husbandman



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The Reproductive Organs of the Cow

Ovary.—There are two ovaries which produce substances (hormones) that account for female characteristics. The ovaries also produce eggs, one egg produced in one or the other ovary every 21 days in the non-pregnant cow. This egg drops into the oviduct where fertilization usually takes place, provided the cow has been bred and her physical condition is favorable.

Oviduct.—Each ovary is closely associated with an oviduct which opens into a horn of the uterus. Each is a very small, crooked tube about the size of a lead pencil. Its function is to catch the egg as it drops from the ovary and to transport the sperm after breeding up to the egg. The fertilized egg is carried back to the uterus in the oviduct. It is in the oviduct that fertilization occurs.

Uterus (Womb).—The uterus is divided into the body and two uterine horns. It is a thick muscular bag,

capable of strong muscular contraction, where the young develops. The inner surface of the uterus is made of many small glands and these produce a secretion called uterine milk. The new developing individual derives nourishment from the latter during the first few days of life. Also inside the uterus are small areas where the membranes, that surround the calf, attach. These small attachments provide nourishment from the cow for the developing calf.

Cervix.—The connection between the body of the uterus and the vagina is the cervix. This forms a protective seal for the uterus, especially during pregnancy.

Vagina.—The vagina is the portion of the birth canal which receives the male organ at time of breeding.

Vulva.—The outside opening of the birth canal is the vulva. It contains the outside opening from the bladder, and the clitoris.

Reproduction of Dairy Cattle

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Reproduction in many dairy herds can be improved, if the various steps in reproduction are better understood. Unfortunately, accurate records have not been kept of the number of bull services per calf produced. However, records of 22,000 cows do show that 60 cows in each 100 get with calf on the first natural breeding, and that 86 cows in each 100 get with calf in three breedings. These records show, also, that from 5 to 7 cows will not breed a *second time*. Breeding troubles, according to recent New York herd health surveys, are serious in one-fourth of all dairy herds.

It is reasonable to assume that Ohio dairy cattle owners would find about the same condition.

If each cow does not produce a calf each year, breeding efficiency is imperfect and milk production is not what it should be.

Occasionally good cows and heifers are slaughtered because the herd owner has bred them a few times and they have not conceived. In the case of both cows and heifers it may be more profitable to spend a little time and money to get them with calf than to raise heifers to take their places.

Normal Phases of Reproduction

The primary sex organs of the cow are the ovaries. They produce eggs, or ova, and hormones responsible for sex differences. Besides the primary sex organs (ovaries), there are the secondary sex organs, the oviducts, uterus, cervix, vagina, and vulva, all of which play a definite part in bringing the sperm from the bull and the egg (ovum) together and in nourishing the new life until it is born. The development of the ovum is closely associated with heat or oestrus.

Heat in the cow normally occurs every 21 days but may vary from 19 to 23 days. The follicle, a fluid-filled sac containing the ovum, develops in only one ovary at a time. It begins to form about 18 days following the heat period. The hormone from the fluid within the follicle passes into the blood stream. It increases the blood supply to the uterus and other parts of the reproductive tract and causes the cow to desire the bull.

The evidences of heat are nervous-

ness, anxious expression of the eyes, bawling, mounting other cows, or usually standing to be mounted. There is a clear, stringy discharge hanging from the vulva or it may be noticed in the gutter. The milk flow is usually decreased. The length of heat varies from 10 to 24 hours with an average of around 18 hours in older cows and 15 hours in heifers.

Ovulation (liberation of the egg from the follicle) occurs 10 to 24 hours after the cow goes out of heat. At the time of ovulation, the egg normally drops into the open end of the oviduct and travels toward the uterus.

Breeding should be timed so that the live active sperm from the male is present in the oviduct when ovulation occurs. Sperm are thought to live in the female from 24 to 30 hours. Generally, it requires from 4 to 8 hours for the sperm to reach the ovum after being introduced. The union of the sperm and the ovum in the oviduct completes

fertilization. In the event fertilization is not completed, the ovum is absorbed. The cow should be bred from the middle to the latter part of the heat.

Occasionally, the follicle (cystic follicle) fails to rupture because of some functional disturbance in the body. The retained hormone produced will cause irregular heat or may produce constant heat for the cow, sometimes referred to as "chronic buller."

After the ovum has been shed, a deep yellow-colored tissue forms in the cavity where the ovum and follicle existed until ovulation occurred. This newly formed tissue is called the "yellow body" or "corpus luteum." The yellow body performs the very important function of producing a hormone the purpose of which is to prepare the uterus to receive the fertilized ovum, and to supply it with nutrients. The hormone also suppresses the development of the follicles and symptoms of heat. In the event the yellow body is removed, abortion usually occurs and the cow comes

in heat. If pregnancy does not occur, the yellow body remains in the ovary until the approach of the next heat period and then becomes inactive. Should the cow not become pregnant but, for some reason, the yellow body remains in the ovary for several weeks, heat will not occur. This condition is usually referred to as a "retained yellow body."

Before breeding troubles, resulting from either a cystic follicle or retained yellow body, can be corrected, a *qualified veterinarian* must determine, if possible, the cause of the condition and treat it accordingly. These troubles are most apt to occur in heavy producing cows.

A small percentage of cows will show signs of heat even though they are pregnant. Observations made in a local packing plant indicate that a few cows and heifers probably are sent to slaughter because their owner thought they were not pregnant. Often good cows are thus sacrificed.

Pregnancy and Birth

When the egg is fertilized it passes to the horn of the uterus. The embryo calf develops its own blood supply and there is no mixing of the latter with the dam's blood. Blood vessels of the dam and calf lie close together and permit a ready passage of the nutrients from the dam to the calf. Waste products pass by the same route back to the mother and are eliminated through her kidneys and lungs. The calf is sur-

rounded by a watery fluid contained in the placenta. At a more or less definite time (280 days) the birth canal enlarges, the muscles contract and the new individual is born.

Twins may result when two follicles mature and rupture during the same heat period, when two ova are present in a single follicle, or when the egg, after fertilization, splits in half and forms two new individuals.

Care at Birth

Great care should be exercised at calving time, owing to the ease with which infection may gain entrance to the uterus. This can cause breeding troubles or death of the cow.

Caution should be observed at calving time. The cow should drop the

calf in a clean well bedded stall, free from drafts. Assistance in delivery should not be given until the female organs have relaxed sufficiently to permit free passage of the calf. If the calf is coming naturally, the cow seldom needs assistance. If help is needed, one

person can pull the calf; if not, something is abnormal and it is time to call for the services of a trained and experienced operator.

Retained afterbirth occurs occasionally and is an indication there is an inflammation of the attachments in the uterus. It may result from infection or from other causes not so easily explained. The removal of the afterbirth is not as simple as it might appear and should be attempted only by a trained,

qualified person. The life of the cow and her future breeding efficiency can be jeopardized by improper care. The advisability of manual removal of the afterbirth before 48 to 72 hours is questionable. To keep the afterbirth clean and free from bacteria, gather it in a clean sugar sack or cloth and tie closely to the body. Saturate with a disinfectant solution 4 or 5 times a day. This will add weight, keep down infection and odors and keep away flies.

Breeding the Heifer

Ordinarily heifers require more services than older cows. A mistake made by many dairymen is to breed heifers that are too young or too small. When heifers fail to get with calf readily, it may reflect a lack of proper care before reaching sexual maturity.

A good rule to follow is to use a tape measure on heifers in order to determine when to breed. Tapes are available, showing measurement computed with weight. Age at breeding will vary with the individual heifer and the care.

Undersized heifers will probably never be very profitable as milk producers.

Recommended Age and Size to Breed Heifers

Breed	Age	Measure Around Heart Girth	Weight
	<i>Months</i>	<i>Inches</i>	<i>Pounds</i>
Holstein and Brown Swiss	16-18	68	900
Ayrshire . . .	16-18	65	800
Guernsey . . .	15-17	63	725
Jersey	15-17	61	675

Breeding Troubles

There are many causes of breeding troubles. A majority of the conditions causing slow breeding in cattle are only temporary in nature and usually can be corrected. If one or more cows in a herd are bred two or more times and do not get with calf, it is advisable to have the cause determined and corrected, if possible, in order to avoid costly delay. A qualified veterinarian can often render valuable service under such conditions. Some reasons for poor breeding results are:

The pituitary gland, located at the base of the brain, may not function properly and retard the functioning of the ovaries.

A freemartin is a heifer born twin to

a bull. Seventy-five per cent or more of freemartins are sexually imperfect and will never breed.

Obstruction in the oviducts preventing free passage of the sperm to the ovum.

Improperly functioning ovaries causing continuous heat, inadequate heat, or perhaps no follicle is formed.

Diseases and infections, such as brucellosis (Bang's disease) trichomoniasis, vaginitis and infections of the uterus after calving, may destroy lining membranes in the reproductive tract or kill or weaken the sperm.

Nutritional deficiencies, particularly a lack of sufficient amount of good quality roughage, vitamins and minerals.

The cow may get with calf but the pregnancy may end prematurely or a weakened calf may be born.

Failure to recognize heat, particularly true where cows are stabled during the winter.

Failure to breed at the proper time.

Over-condition. Occasionally cows that are too fat do not get with calf readily.

Infertile bull. It is not uncommon to find that the bull is producing poor quality semen. He may also spread infection to the cow at the time of mating.

Use of Remedies for Breeding Failure

It should be realized that breeding failure is not a specific disease but rather a symptom of one of many possible troubles. More often than not, there are several things at fault in the "problem herd," or even the individual cow, and each requires specific attention. The use of remedies to cure all breeding troubles, as advertised in some farm papers, is usually a waste of money. The dairyman should also keep

in mind that some of the breeding troubles cannot be corrected with one treatment, and further, some conditions do not respond quickly to treatment but may require several weeks or several treatments before pregnancy will result. There is no place in the body that is so dependent on normal functioning of the rest of the body as in the reproductive tract of the female. It is best to rely on the veterinarian's advice.

Breeding Efficiency

The importance of proper feeding for maximum production and reproduction cannot be stressed too much. For years, many dairymen have fed their herds for high milk production without much regard for health and reproduction. Cows having good pasture in the summer and plenty of high quality hay, along with a balanced grain ration in the winter months, have fewer breeding troubles. Herds deriving their feed from improved soils are usually healthier and more productive. It is advisable, however, to supply minerals to the cows. A mineral mixture composed of half steamed bone meal and half iodized salt may be added to the grain ration at the rate of 2 pounds per hundred or the mineral may be placed

in a box for the cows to eat it at their choice.

Diseases and other infections in the reproductive tract account for many breeding troubles. Brucellosis is generally spread to healthy cows through contact with discharges from the reproductive tract of infected cattle. Trichomoniasis and some forms of vaginitis are usually spread by the bull. Other infections of the reproductive tract may be picked up at the time of calving or under conditions when the afterbirth is retained.

Studies show that the ability of females to reproduce may be influenced by inheritance, i.e., cows that are slow breeders may have offspring that are slow breeders.

The Role of the Veterinarian

In herds where one or more cows are having breeding difficulties, it is worthwhile to have the cows examined by a qualified veterinarian. Often it is possible, by checking the herd, to determine the cause of the trouble and correct the situation before too long a time has elapsed, and thus avoid having

the cow or cows dry for a long period. Also it is desirable to know which cows are with calf. This can be determined 40 to 60 days after breeding. Many herds will justify periodical visits by a veterinarian to maintain the best breeding results. "An ounce of prevention is better than a pound of cure."

Artificial Insemination

More than 21,000 progressive dairy-men have seen the opportunity to improve their herds through cooperative artificial breeding and have become members of one of the two breeding associations in Ohio. They are now obtaining the services of some of the outstanding bulls in the country at lower cost than it would be to keep their own bulls. There were more than 90,000 cows bred to 80 bulls in 1947. This is a little less than 10 per cent of the milking cows in the five dairy breeds in Ohio. All of these bulls are purebred.

Successful results can be measured by the ability of the inseminator and the

spirit of cooperation between the member and the inseminator. When breeding problems do occur, it is well to talk the situation over with the inseminator in order to determine results in neighboring herds. If the results in other herds are better than in your own herd, call for the services of a qualified veterinarian. If the overall results obtained by the inseminator are poor, then talk the situation over with your county director of the breeding association, as well as with the county agent. They are anxious to see you get good results. For information about the artificial breeding service, see your county agricultural agent.

How to Obtain Better Breeding Results

1. Keep a good breeding record. Record date of breeding, freshening, and condition after freshening, such as normal, aborted, retained afterbirth, injured, etc. Barn breeding record forms are available through the county agricultural agent.

2. Anticipate heat periods, make a note on the calendar in the barn and breed the cow, if possible, from the middle to the latter part of the heat period. Note the discharge from the cow and, if it is colored or contains pus, delay breeding until the next period. A bloody discharge noticed on the tail a day or two after heat is usually normal.

In winter months when cows are stabled, this may serve as a guide for the next heat period, 19 to 20 days in advance.

3. Feed proper rations, especially during pregnancy. Over-condition (excessive fat) may cause shy breeding. For further information on feeding, obtain the bulletin "Feeding Dairy Cattle," from your county agricultural agent.

4. Allow each cow a dry period of 6 to 8 weeks before calving.

5. Place the cow to freshen in a clean, well-bedded, maternity stall before calving. In cold weather allow the cow to have a fresh pail of water, with the chill

taken off, soon after calving. If extremely cold, blanket the cow. Try to keep her as comfortable as possible.

6. Tie the cow up until the afterbirth has been released and passed out. This is to provide a check on whether the membranes are properly and completely discharged. Also it is important to prevent the cow from eating the membranes, as many will do, if not tied. Occasionally a cow eats the afterbirth. She may choke in the attempt or may suffer indigestion. The afterbirth should be allowed to come away naturally. If it fails to do so within 48 to 72 hours after calving, the cow may require expert attention in order to avoid sickness or costly delay in rebreeding. Whether the membranes should be manually removed depends on the condition of the

cow and the condition of the uterus.

7. Do not rebreed the cow sooner than 60 days following calving. Allow time for the condition of the reproductive tract to return to normal. Observe heat periods for regularity.

8. Raise your own replacements when possible. Remember good dairymen prefer to keep their best cows. Most diseases are introduced into the herd through purchased animals.

9. Control disease! Practically every disease known to cattle can be controlled and eradicated. Brucellosis (Bang's Disease) is no exception. Start now to plan and develop an overall herd health program. Unhealthy herds are unproductive herds. Your local veterinarian will be glad to help you plan a program.