

# Troubleshooting Infertility Problems in Dairy Cattle

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IRM-19

## Dairy Integrated Reproductive Management

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Dr. L.J. Hutchinson  
The Pennsylvania State University

Most producers experience a herd problem with reproductive performance at some time. This may occur in the absence of any readily apparent change in management. When reproductive efficiency declines, the dairy producer should work with the herd veterinarian, artificial insemination (AI) technician, feed company representative, county Extension agent and other resource people to troubleshoot the causes and determine solutions to the problem.

The following material identifies the major types of herd infertility problems and their possible causes, and gives suggestions for their prevention and control.

### Retained Placenta

When a freshening cow fails to expel her placenta (afterbirth) within 12 hours after calving, the condition is known as retained placenta (Fact Sheet IRM-21). Incidence of retained placenta in dairy herds should not normally exceed 8%.

### Possible Factors Involved

1. Specific infections such as **brucella**, **leptospira**, **campylobacter**, **infectious bovine rhinotracheitis** (IBR) and others can result in retained placenta. These infections may cause abortion but can also cause retained placenta following delivery at term.
2. Non-specific infections by a wide range of bacteria and viruses that occur during pregnancy or at calving can be associated with retained placenta.
3. Twin births and abnormal deliveries, including prolonged or difficult deliveries or caesarian sections, are often followed by placental retention.
4. Deficiencies of selenium, vitamin A or vitamin E may cause higher than normal incidence of retained placenta.
5. Overconditioning of dry cows due to excess energy intake and/or prolonged dry period is often associated with retained placenta.

### Troubleshooting and Control Suggestions

1. Test for specific infections. Use blood tests as well as bacterial or viral cultures in diagnosing specific infections. If an infection is identified, treat, vaccinate or cull infected cows as indicated.
2. Minimize exposure to non-specific organisms by keeping calving areas clean and well bedded. Calve on grass if practical. Don't use maternity pens for any other purposes.
3. Breed heifers to bulls with a record of calving ease (Fact Sheet IRM-16). Observe freshening cows and heifers closely. Provide assistance if hard labor continues for over 30 minutes without progress. If assistance is required, do so in a clean, gentle manner.
4. In selenium-deficient areas of the U.S., provide supplemental selenium as dry feed or injection to all dry cows. Take tests to determine selenium status. Provide cows with fresh forage as pasture or green chop for at least 4 to 5 weeks each year. Provide about 160,000 units of vitamin A (One milligram of carotene is equivalent to 400 units of vitamin A.) from all sources (natural and supplemental).
5. Avoid overconditioning. At drying off time have cows in about the body condition in which they should freshen. Limit access to high-energy feeds such as corn silage or grain during the dry period.

### Metritis

Infection of the uterus is known as metritis (Fact Sheet IRM-22). Cows normally have a red-to-brown discharge during the first 2 weeks after calving. If discharge persists beyond 2 weeks or if the discharge is foul-smelling, this is evidence of metritis.

## Possible Factors Involved

1. Many cows with retained placenta will develop metritis. (See factors involved in retained placenta.)
2. Injury to the reproductive tract can occur due to a difficult calving (Fact Sheet IRM-20) or excessive force used to assist at calving. Injuries can also occur at the time of breeding or uterine treatment.
3. Contamination of the reproductive tract can happen at calving when cows and heifers are highly susceptible to infection. If the calving area is unclean or if assistance and/or treatment around calving time is unsanitary, metritis is a probable result.
4. Use of uterine boluses can cause a sterile pus condition due to body reaction to materials contained in some boluses.
5. Selenium or vitamin E deficiency may be associated with metritis.
6. Overconditioning may predispose cows to many health problems at the time of calving or during early lactation; these include retained placenta, metritis, acetonemia and displaced abomasum.

## Troubleshooting and Control Suggestions

1. If incidence of retained placenta is greater than 8%, see control measures listed earlier. Many of the same conditions that predispose cows to retained placenta contribute to development of metritis.
2. Calve cows in a clean place.
  - a. Use reasonably clean paddocks or pastures in good weather. Locate calving area to permit frequent observation.
  - b. Clean, sanitize and re-bed maternity pens after each calving. Use long-stem bedding instead of sawdust if possible.
  - c. Rest calving sites for one to two months when metritis or calf infections are widespread. Calve cows in a new, clean site.
  - d. Keep maternity pens free from all animals except calving cows.
  - e. If assistance at calving time is required, use clean, disinfected instruments; tie tail to front leg; wash vulva and surrounding area with a mild soap; wash arms and hands before assisting at delivery, use a non-irritating lubricant; work with the contractions of the cow; and don't exert excessive pressure. Be sure that the position of the calf is normal before attempting to pull the calf. Seek veterinary assistance if position of the calf or size of calf relative to dam's size indicates a problem delivery.

4. Follow your veterinarian's recommendations on when to treat metritis and retained placenta and which medications to use.
5. In selenium-deficient areas, add supplemental selenium to milking and dry cow rations or give selenium injections.
6. Avoid overconditioning during late lactation and dry period, while maintaining adequate, balanced vitamin and mineral intake.
7. Have all cows examined by your veterinarian 2 to 6 weeks after calving to diagnose injury or infection.
8. Follow your veterinarian's recommendations for treatment of metritis. Avoid overtreatment. Avoid routine medication of the uterus unless a cow is known to be infected.

## Cystic Ovaries

Ovarian cysts (Fact Sheet IRM-25) are structures, usually greater than one inch in diameter, that persist on one or both ovaries for 10 days or more. Fertility in cystic cows is reduced due to hormonal changes, changes in uterine tone and, in many cases, failure to release an ovum (egg).

## Possible Factors Involved

1. Excessive calcium intake or wide calcium-phosphorus ratio. Total dietary intake of greater than two parts calcium to one part phosphorus may lead to increased incidence of cysts.
2. High estrogen intake whether given by injection, through fresh legume forage or from some mold toxins, may increase the incidence of cystic ovaries.
3. Genetic predisposition.
4. Stressful conditions or health problems at calving or early postpartum.

## Troubleshooting and Control Suggestions

1. Have forages analyzed, including calcium and phosphorus analysis. Check the feed program to insure that the calcium-phosphorus ratio is between 1.5:1 and 2:1 in the total diet. Include all forages, grains and free-choice minerals in estimating mineral intake.
2. Avoid use of injectable estrogen products. These are potent drugs for use only by or under the direction of a veterinarian. Analyze feeds suspected of containing zearalenone or other mold toxins. Do not use feedstuffs containing high levels of other estrogenic mold toxins or plant estrogens to breeding stock, or limit feed to reduce estrogen intake.
3. Since genetic predisposition to ovarian cysts can occur, reduce herd incidence of cystic ovaries by selective culling of cows known to produce cystic daughters and avoid use of bulls known to sire cystic daughters.

## Anestrus

Anestrus, or failure to show signs of estrus (heat, Fact Sheet IRM-7) is in most cases a failure to detect estrus. In one study of cows reported to be anestrus, 90% were determined to be cycling but not detected in estrus and only 10% were truly anestrus (no ovarian activity).

### Possible Factors Involved

1. Undetected estrous signs in cows with normal ovarian activity resulting from:
  - a. inadequate estrous detection since 66% of estrous signs are shown between 6 p.m. and 6 a.m. Cows with short estrus (less than 12 hours in length) may be missed even with twice-a-day estrous detection. This is particularly true when cows are observed for estrus during a time when they are unlikely to exhibit standing behavior;
  - b. inadequate animal identification and/or inadequate records (Fact Sheet IRM-4);
  - c. lack of opportunity for cows to express estrus, i.e., cows not turned out; slippery footing; lameness or stiffness; groups too small for adequate interaction.
2. True anestrus, lack of ovarian activity, caused by:
  - a. anemia—due to anaplasmosis, internal or external parasites, deficiency of protein, iron, copper, cobalt or selenium;
  - b. phosphorus deficiency;
  - c. energy deficiency, cows losing flesh due to high production and/or underfeeding;
  - d. low hormone levels associated with prolonged feeding exclusively on stored feeds;
  - e. cystic ovaries (70% of cystic cows are anestrus.);
  - f. pyometra or pus in the uterus.
3. Quiet estrus or silent estrus—normal ovarian activity with little or no signs of estrus. Most of the factors associated with true anestrus (anemia, phosphorus deficiency, energy deficiency and low endocrine levels) can also be associated with quiet estrus.

### Troubleshooting and Control Suggestions

1. Maintain adequate reproductive records. Record all estrous dates, examination dates and findings, unusual events such as difficult calving or retained placenta, and treatments.
2. Closely observe cows for estrus.
  - a. Observe cows at least twice and preferably 3 times a day for estrus. Make sure an estrous detection time is in the evening.
  - b. Observe cows for at least 20 minutes at each detection time.

- c. Don't let any other farm chores distract from estrous detection. Observe cows when they are not occupied with eating, being milked or other activities.
    - d. Provide a non-slippery surface for estrous detection, so cows are most likely to exhibit signs of estrus.
  3. Check problem cows for anemia. Take unclotted blood samples from 12 to 21 early-lactation cows. If anemia is present, check for internal and external parasites. Check blood for iron, copper and selenium status. Treat for anemia if detected. Correct predisposing causes.
  4. Submit forage samples for standard and mineral tests. Seek assistance to develop a feed program that meets herd nutritional requirements.
  5. Have cows examined for uterine infection, cystic ovaries and for evidence of ovarian activity. Have a veterinarian palpate all cows at least once between 15 and 45 days after calving.
  6. Whenever possible, have cows in a weight-gaining condition as desired breeding time approaches.
  7. Control conditions around calving time and early lactation that may contribute to anestrus problems (retained placenta, metritis, ketosis).
  8. Provide access to fresh forage for at least 4 to 6 weeks each year.
  9. Have pregnancy exams done 40 to 60 days after breeding.

### Repeat Breeders

A reasonable goal for first-service conception rate is 50 percent. After two services the cumulative conception rate should be around 75%. Cows requiring three or more services before conception or culling are generally designated as repeat breeders (Fact Sheet IRM-23).

### Possible Factors Involved

1. Embryonic or early fetal mortality caused by:
  - a. gross overfeeding;
  - b. excessive manipulation of the reproductive tract by rectal examination;
  - c. *trichomoniasis* or *vibriosis* (Either of these venereal diseases can cause early embryonic death and repeat breeding. These diseases are spread by natural service.);
  - d. *leptospiira* and possibly virus infections of the reproductive tract;
  - e. *ureaplasma*, *mycoplasma*, *haemophilus* and many other infectious agents which produce a low-grade infection that either prevents conception or results in early embryonic death. Affected cows may or may not show abnormal discharge.

- Breeding too early or too late in relation to time of ovulation.
- Use of low fertility sires.
- Use of semen damaged in storage or handling (Fact Sheet IRM-11).
- Poor insemination technique (Fact Sheet IRM-12).
- Serious imbalances or deficiencies of vitamins or minerals.

### Troubleshooting and Control Procedures

- If natural service is used, test for **vibriosis** and **trichomoniasis**. If present, discontinue natural service and cull the bull. Use a vaccine for protection against **vibriosis**.
- Test for **leptospira**, **IBR**, **BVD**. Use available vaccines for protection against these organisms.
- Avoid gross overfeeding of grain, especially after breeding.
- Provide cows with access to fresh forage such as pasture or green chop for at least 4 to 6 weeks a year.
- Carefully observe estrous onset and duration. Breed 12 hours after initial observation. On long-estrous cows (more than 24 hours), inseminate a second time 12 to 18 hours after the first insemination.
- Have a veterinarian examine repeat breeder cows for presence of endometritis (low-grade uterine infections), delayed ovulation or other abnormalities.
- Use high fertility bulls.
- Have semen handling and insemination technique checked by competent AI personnel. Semen viability of representative straws can be analyzed.

### Abortions

Causes of abortion (Fact Sheet IRM-24) can be either infectious or non-infectious. In about 70% of abortions, the cause cannot be determined even with careful laboratory examination. In the absence of specific infections, a herd abortion rate of around 3% is normal.

### Possible Factors Involved

- Genetic defects**— A severely abnormal embryo or fetus is likely to be absorbed or expelled in early pregnancy.
- Multiple fetuses**— Abortion rate is higher in multiple-fetus pregnancies—twins, triplets, etc., than in single pregnancies.
- Injuries**— In early pregnancy (less than 60 days) excessive manipulation of the reproductive tract at the time of rectal examination can cause abortion. Passage of an insemination or

infusion instrument into the uterus of a pregnant cow can cause abortion. Severe injuries in late pregnancy such as falling on a hard surface can induce abortion.

- Specific infections**—**Brucellosis**, **leptospirosis**, **IBR**, **BVD**, **listeriosis**, **vibriosis**, **trichomoniasis**, **mycotic** infections and others can cause abortion.
- Toxicities**— Acute nitrate, cyanide, silo gas and some weeds can cause abortion.
- Drug-induced abortions**— Cortisone-type drugs and prostaglandins, among others, can cause abortion.

### Troubleshooting and Control Procedures

- Avoid injuries. Groove slippery concrete surface and/or apply nonslip materials to floor. Keep cows off icy areas.
- Use extreme care in handling the reproductive tract of possibly pregnant cows. On repeat services do not allow the insemination rod to enter the body of the uterus. Discuss with your veterinarian the minimum number of days since last service at which he or she feels capable of detecting pregnancy without risk to the fetus.
- When an abortion occurs, submit samples for laboratory diagnosis. Place the entire fetus in a plastic bag. Put the placenta or at least a portion of the placenta including a cotyledon in a separate plastic bag. Submit to a reference laboratory for evaluation. Draw blood from an aborting cow at the time of the abortion and again three weeks later for serologic testing for **brucellosis**, **leptospirosis**, **IBR** and **BVD**.
- Eliminate cow access to swamps, ponds or standing water.
- Submit for laboratory analysis any suspected feed or water. Toxicities severe enough to cause abortion are generally short-term access to high levels of a poison or toxin.
- Most abortion-inducing drugs, such as cortisones and prostaglandins, are prescription drugs. Allow use only by a veterinarian or on his or her instruction.

When herd reproductive problems occur, they can have a major economic impact. Good records and a good working relationship with the herd veterinarian and other resource people minimize the chances of reproductive problems. If they do occur, use records, resource people and a systematic troubleshooting approach to solve those infertility problems.

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