University of Missouri Extension

G3030, Reviewed October 1993

Getting Problem Cows Pregnant

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An average interval of 70 days from calving to first breeding and a high fertility rate are important to maximize efficiency in dairy herds. The results are more milk and calves at reduced cost.

Detecting cows in heat is the first step in getting them pregnant. Many dairy cows ovulate within three weeks after calving, and 90 percent have ovulated by 50 to 60 days postpartum. Many cows are not detected in heat by this time because of insufficient heat detection. In addition, many cows that are inseminated do not maintain a pregnancy and return to estrus, while other cows do not resume heat cycles following calving (anestrus). The latter two groups comprise the group called "problem cows." This publication examines management procedures for getting hard-to-breed cows to conceive.

Early identification and diagnosis of reproductive disorders is necessary for attaining good reproductive efficiency in a dairy herd.

Disorders affecting reproduction

True anestrus

As previously outlined, most cows have initiated ovarian cycles by 50 days after calving. Estrous cycles, however, are sometimes delayed in cows that experience problems at calving or are in a severe negative energy balance following calving. Energy balance is probably more important than level of milk production in delaying the beginning of heat cycles. So, cows should be in good body condition at calving and dry-matter intake maximized as soon as possible after calving.

Many drugs and hormones have been used to treat anestrus, but none has proven successful. Instead, producers must employ excellent management techniques with the postpartum cow for good reproductive performance.

Ovarian cysts

Development of ovarian cysts in dairy cattle is a serious cause of reproductive failure. Ovarian cysts are generally defined as follicle-like structures

at least 2.5 centimeters in diameter that persist for at least 10 days in the absence of a corpus luteum.

Two types of cysts are described:

- Follicular
- Luteal.

Follicular cysts occur as single or multiple cysts on one or both ovaries. They are usually thin walled, and progesterone secretion by follicular cysts is low. Luteal cysts are usually single structures on one ovary and are generally thicker-walled than follicular cysts. Luteal cysts may secrete moderate amounts of progesterone. Most cysts (70 percent) are classified as follicular.

Most cows — 80 percent — with ovarian cysts do not show signs of heat (anestrus), but some 20 percent may have frequent or intense signs of heat (nymphomania). The occurrence of ovarian cysts varies among herds and ranges from 6 to 30 percent. Cows are usually infertile as long as the condition persists. Ovarian cysts are most common during the first 60 days after calving. Spontaneous recovery from ovarian cysts and resumption of normal estrous cycles without treatment may occur. Up to half the cows that develop ovarian cysts before their first postpartum ovulation may recover without treatment, while about 20 percent of those that develop cysts later after calving may be expected to recover without treatment. Cows with ovarian cysts should be treated immediately after the condition is detected, because the interval from treatment to conception averages about 50 days.

Currently, the most commonly recommended treatments for ovarian cysts in cows are gonadotropin releasing hormone (GnRH) and hormone preparations with high luteinizing hormone (LH) activity. Treatment with GnRH causes release of the cow's own LH. Treatment with GnRH or LH results in re-establishment of normal estrous cycles in about 80 percent of cows within 30 days. The interval from treatment to estrus is usually 18 to 23 days, but the time from treatment to estrus may be shortened to 12 days by administering a luteolytic dose of prostaglandin F_2 alpha nine days after GnRH or LH treatment.

Producers can reduce infertility caused by ovarian cysts by preventing their occurrence. One possible way may be to select through genetics by elimination of animals that develop ovarian cysts and their offspring and breed only to bulls whose offspring have a low incidence of ovarian cysts. Unfortunately, genetic information is not widely available in the United States, making selection difficult. Several investigators have reported that prophylactic treatment with GnRH about two weeks postpartum induced ovulation in cows with large follicles and reduced the incidence of ovarian cysts and the number of cows culled due to infertility.

Abnormalities of the puerperium

Reproductive efficiency is lowered by almost any disorder associated with the dry period, parturition and early lactation (Table 1). Producers should attempt to prevent problems before they arise rather than treat problems after they develop. Some disorders may predispose the cow to other disorders; for example, milk fever is frequently accompanied by retained placenta.

Table 1

Effects of problems occurring during a lactation on reproductive traits. (Data are from 2,352 observations in 14 Missouri dairy herds)

Item	Average calving interval	Average days to postpartum breeding	Average services per conception
No problem	395 days	86	1.8
Metritis	433 days	99	2.3
Cystic ovaries	447 days	107	2.1
Retained placenta	419 days	92	2.0
Anestrus	480 days	141	2.2
Aborted	402 days	80	2.4

Dry cows should be separated from lactating cows and fed according to current recommendations. In general, energy and crude protein should not be excessive and adequate fiber should be available. Calcium should be available in adequate but not excessive amounts, and should be in a ratio of about 1.5:1.0 with phosphorus.

Following calving, cows should be fed according to recommendations for the cow's level of milk production to achieve adequate consumption of protein, energy and minerals. While inadequate energy consumption has been associated with decreased fertility, there is no single nutritive additive that will improve fertility.

Producers should provide a good environment during the parturient period. A dry environment is necessary. Shade is needed in the heat of the summer, and some shelter is needed in extremely cold weather. Allowing cows to calve outside if weather permits usually lowers the exposure of dam and calf to infectious microorganisms. The result often is a healthier cow and reduced loss of calves.

If it is not possible for cows to calve outdoors, they should be calved in a well-bedded stall. Straw is the best bedding. Producers should clean and disinfect stalls between calvings and allow them to remain vacant for at least two weeks twice a year.

It is often desirable not to return the cow to the milking herd until the placenta has been passed. In addition, assistance at calving without strict attention to sanitation increases the probability of infection in a contaminated environment. Cows are most susceptible to infection of the reproductive tract at calving, particularly if a retained placenta occurs.

Retained placenta

Cows that retain the placenta for more than 12 hours after calving are more likely to develop uterine disease than are cows that do not retain their placenta. However, those cows whose reproductive tract rapidly returns to normal following a retained placenta are as fertile as their herdmates. This indicates that in the absence of a subsequent reproductive abnormality, a retained placenta has a minimal effect on reproductive performance. The prevalence of retained placentas is higher following delivery of twins or deliveries complicated by dystocia. Delivery of a calf outside the normal gestation length (shortened or prolonged) is accompanied by an increase in the prevalence of retained placentas.

The clinical signs of retained placentas are usually obvious to the dairy producer, but in some cases the placenta may be entirely within the genital tract. Most affected cows show no serious clinical signs other than a transient decrease in appetite and milk production. Some cows — 20 to 25

percent — affected by retained placentas develop moderate to severe infections of the uterus. The most objectionable clinical signs are the malodorous discharge and the unsightly mass of tissue hanging from the genital tract. Retained placentas are usually expelled seven to 10 days after calving.

Researchers have advocated a variety of treatments for retained placentas, including aggressive attempts at manual removal, intrauterine or systemic antibiotics (alone or combined with manual removal) and no therapy whatsoever. Treatments and their indications are:

Manual removal
Most contemporary authors agree that manual removal of the placenta is indicated only when it may be removed by gentle traction, indicating that most or all placentomes have separated. Manual removal is specifically contraindicated when the patient shows any sign of systemic illness (septicemia). Unfortunately, many dairy producers are accustomed by tradition to manual removal and may insist on attempting the procedure to the detriment of the patient's health and future fertility.

Myometrial stimulants
Several authors have suggested that oxytocin administered within the first 24 to 48 hours after calving may be beneficial in promoting expulsion of the placenta. More recent work, however, has shown that treatment with a single dose of oxytocin does not reduce the incidence of retained placentas in cows that calve normally nor in cows that require assistance at calving. Treatment with an estrogenic hormone immediately after calving may decrease fertility in cows with retained placentas.

Antibiotics
Reports concerning the results of treatment of retained placentas are conflicting. In one trial, reproductive performance of cows with retained placentas treated with intrauterine tetracycline was found to be similar to that of unaffected herdmates and better than that of affected cows that were examined vaginally. Others have found that treatment with tetracycline reduced subsequent fertility and that normal conception rates could be expected if no medication were given. Routine treatment of cows that required assistance at delivery or had retained placentas with systemic and intrauterine antibiotics did not help prevent metritis. Pyometra may develop even in treated cows.

Uterine infections
Even without placental retention, the uterus at calving is susceptible to microbial invasion. The uterus of the cow continues to contract strongly for 48 hours following delivery of the calf. During this time, the cow usually sheds the placenta and evacuates the majority of uterine fluid (lochia).

Abnormalities of involution cannot be diagnosed by palpation per rectum during the first week after calving. During that time, both normal and abnormal uteri are out of the examiner's reach and he or she cannot safely retract the uterus. By 10 to 15 days after calving, the examiner can palpate the entire uterus if involution is normal. Fluid should not usually be palpable within the lumen of the uterus by 14 to 18 days after calving if involution is normal. Gross reduction in size and histologic repair of the endometrium are complete in dairy cows by 40 to 50 days after calving.

For the first two weeks after calving, cows normally expel lochia, which may range in color from dark red or brown to white. If involution is delayed, discharge of lochia may continue until 30 days postpartum. The producer shouldn't consider the discharge of lochia abnormal unless the fluid is fetid, continues to be discharged for longer than 30 days or the cow develops other clinical signs.

Some cows do develop uterine infections. Many factors influence the severity and prevalence of uterine infections in cows. They include the species and pathogenicity of the causative organism, defenses and dietary management of the affected animal, and environmental sanitation.

Bacteria contaminate the uterus of all cows during parturition. Most of the organisms are merely transient residents of the reproductive tract and the involuting uterus in normal cows eliminates them.

In cows that develop uterine disease, *Clostridium* spp. occasionally colonize the anaerobic postpartum uterus, causing severe toxic metritis. Other species of bacteria may be found in the uterus, but they have little effect on fertility. These organisms may, however, produce penicillinase (an enzyme that inactivates penicillin) and influence the choice and route of administration of drugs used in treating uterine infections.

White blood cells (neutrophils) normally remove bacteria from the uterus. The ability of white blood cells to remove bacteria is depressed by an abnormal delivery (dead fetus or difficult birth), trauma to the uterus by obstetric manipulations or attempts to remove retained placentas and by some antiseptics and antibiotics.

Uterine infections range from mild to severe depending upon the disease-producing ability of the invading microorganisms. Less severe cases are characterized by delayed uterine involution and impaired fertility. More severe cases (toxic metritis) are life threatening and are characterized by fever, depression, decreased milk production and lack of appetite. Pyometra is characterized by the accumulation of fluid within the uterus and persistence of a corpus luteum. The uterus is brought under the influence of progesterone, which further depresses phagocytic activity. Cows affected with pyometra seldom display any clinical signs other than failure to have estrous cycles.

Fluid from the infected uterus may ascend into the uterine tubes (oviducts), causing severe damage and reducing fertility. Frequently, abnormalities of the uterine tubes are not detected by palpation per rectum.

Researchers have advocated a number of hormones, antibiotics and antiseptics for treatment of uterine infections in cows. Unfortunately, many of the recommendations have been based on uncontrolled observations.

The most reasonable antibiotic treatment (when indicated) for uterine infections is intrauterine administration of oxytetracycline or systemic administration of penicillin during the early postpartum period and intrauterine or systemic administration of penicillin after 30 days postpartum. Treatment of dairy cows with antibiotics results in residues in the milk from treated animals.

Prostaglandin F_2 alpha is the treatment of choice for bovine pyometra. Treatment is followed in three to nine days by uterine evacuation in 85 to 90 percent of treated cows. In cases of chronic metritis, treatment with PGF_2 alpha decreases the numbers of days open. Treatment of cows with GnRH at two weeks after calving may improve fertility, but treatment with GnRH at this time may decrease fertility by increasing cases of pyometra in herds with a high incidence of uterine infections.

As previously outlined, cows that suffer from abnormalities at calving time, such as milk fever, dystocia and retained placenta, are more likely to suffer from uterine disease than are cows that calve normally. Producers should closely observe these cows for abnormal clinical signs and treat them appropriately. Routine treatment of all cows with antibiotics has not been shown to be beneficial and in some cases has reduced fertility. Producers can reduce or prevent the number of postpartum uterine infections by strict sanitation in the calving environment and during assistance

with delivery. Proper management during the dry period also reduces infections. This approach probably will be more successful than attempts to treat uterine disease with antibacterial drugs.

Feet and legs
Both genetic selection and management of feet and leg problems have been related to fertility in dairy cows. In one study evaluating the relationships of hoof traits to several performance traits, cows that survived three to four lactations had shorter hooves and steeper angles than those that did not survive, and days open were lower. In addition, lameness has been associated with longer intervals between calving and first service and calving and conception. The conception rate during the two months preceding diagnosis of lameness is approximately 10 percent lower than at other times. Also, cows with feet and leg problems do not mount as frequently on concrete, nor are they willing to stand on concrete when mounted. A good hoof care program is necessary to reduce feet and leg problems. It is probably helpful to trim the feet of all cows when they are turned dry. Consideration should also be given in sire selection for correctness of feet and legs.

Repeat breeders

A repeat breeder is one that has returned to heat after a third infertile service, is exhibiting normal intervals between heats, has calved at least once to exclude those with congenital abnormalities, is less than 10 years of age, has no evidence of abnormalities of the genital organs detected by rectal palpation and has no abnormal genital discharges. The repeat breeder cow is one of the most frustrating reproductive management problems in a dairy herd.

The overall herd conception rate affects the percentage of repeat breeders. In herds with low conception rates, the incidence of repeat breeders is high; with high conception rates, the incidence of repeat breeders is low. For example, repeat breeders comprise 34 percent of the herd if the overall conception rate is 30 percent and only 3 percent if the overall conception rate is 70 percent. Thus, the producer should evaluate overall herd conception rate before determining the magnitude of the repeat breeder problem.

Causes for repeat breeder problems may be: hormonal asynchrony; increased incidence of abnormal embryos; and uterine pathology due to histopathological lesions of the reproductive tract or pathology present at the time of insemination. Errors in detection of heat may also contribute to the problem of repeat breeding. In one study, 12 of 14 repeat breeder cows eventually conceived and four of five of the cows had good fertility the following year. Postbreeding infusion of antibacterial drugs has been used to treat repeat breeder cows thought to have uterine infections, but fertility has not been improved. In addition, notice must be taken of milk withholding time following intrauterine infusion of antibiotics because residues will be transferred into the milk.

Recently, GnRH given at the time of breeding increased conception rates in repeat breeders, but not first service conceptions. The reason for the success has not been determined, but it is likely that the GnRH-induced LH release either synchronized ovulation in late ovulating cows or increased luteinization of follicular cells forming the corpus luteum following ovulation.

G3030, reviewed October 1993

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■ Issued in furtherance of the Cooperative Extension Work Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. Director, Cooperative Extension, University of Missouri, Columbia, MO 65211
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