Factors causing uterine infections in cattle

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INTRODUCTION

Uterine infection is a major problem in reproductive management, second only to inefficient estrous detection. Cows with uterine infection in the early postpartum period generally have lower conception rates at subsequent breedings. One large study conducted in Washington demonstrates that cows with severe uterine infection experienced an 8 percent reduction in first service conception rate compared with herdmates that were not infected. This effect would likely have been more severe if the herds had not been participating in a routine herd health program in which uterine infections and other postpartum reproductive problems were detected and treated early. Other studies confirm that even mild uterine infections adversely affect conception rates.

A high percentage of cows have bacteria present in the uterus during the first two weeks after calving, and may be considered infected. However, by two months post-calving, the prevalence of uterine infection should decline to less than 10 percent. Older cows tend to have more infections. The natural process of uterine repair (involution), with all the associated physiological mechanisms is usually very effective in reducing the population of bacteria and inflammation in the uterus. Factors that can contribute to a higher than usual rate of infection include nutritional factors, environment, improper calving assistance, postpartum infusions, inaccurate heat detection, and organisms.

NUTRITIONAL FACTORS

Overconditioning at the time of calving has been related to a higher incidence of infections in some studies, since overconditioned cows may exhibit poor uterine muscle tone, fatigue earlier during the calving process, and experience a higher incidence of difficult births. On the other hand, severely underconditioned cows appear to be more susceptible to infection than cows in proper condition. Monitor body condition in late lactation so that cattle calve with body condition scores between 3+ to 4- on a scale of 1 to 5.

It is important to maintain adequate levels of calcium, selenium, and vitamins A and E in the rations of both dry and lactating cows. Calcium is important for proper uterine smooth muscle contraction. Low levels of blood calcium may contribute to retained placenta resulting in uterine infection. Low calcium may also delay uterine involution.

Selenium has been shown to enhance uterine contraction in sheep. More importantly, selenium has several complicated functions related to defense against disease such as metritis (uterine infection) and mastitis. Selenium and vitamin E supplementation has frequently been shown to reduce the incidence of retained placenta in herds where the levels of these nutrients were low. Vitamin A is important to maintaining and repairing epithelial tissues, which line the interior of organs. With respect to reproduction, vitamin A is probably important to uterine involution and maintenance of healthy uterine tissue.

Other nutritional factors may be indirectly related to maintaining uterine health, so feeding a balanced dry cow ration is critical. Adequate tissue levels of proper vitamins and minerals must be present prior to calving and throughout the postpartum period if uterine health is to be maintained.
ENVIRONMENT

As more of our cattle calve in confined areas, considerable attention should be given to sanitation prior to, during, and after calving. At this time, the cervix is dilated and the uterus is exposed to a variety of infectious agents in the environment, including bacteria, viruses, bedding material, dust, and possibly molds. Already irritated from the calving process, the uterus is susceptible to infection. Contaminated maternity pens or stanchion areas provide an ideal environment for infecting the reproductive tract.

Even healthy cattle fed appropriate levels of vitamins and minerals cannot withstand the continual exposure to virulent organisms present in wet, sloppy free stalls, stanchions, dry cow pens, and calving areas. Cows should freshen in a maternity pen reserved for calving or—during the warmer months—in a clean, dry nearby pasture.

Keep the maternity area well ventilated, dry and well bedded (preferably with straw). For larger herds, several such pens should be clean and available at all times. To maintain general health of the herd during the warm and humid months, it may be necessary to increase ventilation, clean dry cow and calving pens more frequently, and reduce the density of cows per unit area.

Uterine infections can occur suddenly, even when cows have calved in the same area for years with no problems. Perhaps the population of organisms has become so great, the cows have become stressed, or a new pathogen has been introduced that causes an infection. If this occurs, the calving area needs to be completely cleaned and disinfected.

CALVING ASSISTANCE

Difficult births and retained placenta frequently result in metritis. Do not provide assistance before it is needed. Interfering too early in the calving process may cause more problems than it solves. Review calving assistance technique and preliminary treatment for retained placenta with a veterinarian. Before giving assistance, thoroughly wash the perineal region with disinfectant, soap, and water. Obstetrical chains and other equipment should also be disinfected. Use disposable plastic sleeves to protect both cow and humans from transfer of infectious organisms.

To avoid calving difficulty, be sure heifers have grown to adequate size before they are inseminated. Semen from calving-ease sires should be used for virgin heifers. Realize that if natural service is used for the heifers, there is little data on the incidence of difficult births for these bulls until it is too late.

POSTPARTUM INFUSIONS

In an attempt to prevent uterine infections, some dairy producers infuse every cow within a week after calving. Several studies have shown that this approach does not improve first-service conception rate. Results from some of these trials show that the incidence of uterine infection actually increased following routine infusion of every cow. The uterus should be allowed to involute without intervention. Only cows that develop a uterine infection should be infused. Use an effective product that has been recommended by a veterinarian. Use of prostaglandin is becoming a more popular therapy for uterine infection than antibiotic infusion.
INACCURATE HEAT DETECTION

When cows are continually inseminated based on incorrect signs of heat, the chance of inseminating a cow that is not in heat increases. A variety of field trials using milk progesterone analysis have indicated that between 5 and 15 percent of dairy cattle are inseminated when progesterone levels are too high for the cows to be in or near heat at the time of insemination. If a cow is bred when she is not in or near heat, her uterus is under the influence of the hormone progesterone. It has been shown that progesterone reduces the uterine defense mechanism. One mechanism—the migration of white blood cells (leucocytes) into the uterus—is delayed. Therefore, if an infectious agent is present in the environment or in the vagina, or an unsanitary AI technique is used, there is greater probability the cow will become infected than if she were inseminated when in standing heat. Estrogen present during heat improves leukocyte migration, blood flow through uterine tissue, and muscle contractions—all of which contribute to neutralizing invading bacteria. Even if the cow is inseminated at the correct time, unsanitary, sloppy, or rough technique can overwhelm the uterus with trauma and bacteria. Infectious agents are more likely to become established in the uterus of the cow inseminated when not in estrus.

ORGANISMS

Of the variety of organisms found in the uterus, some are more pathogenic than others. *Actinomyces pyogenes* is considered to be a major pathogen of the reproductive tract. *Ureaplasma* can also cause uterine infection and contribute to repeat breeding. Little is known about this organism other than it tends to reside in the vulva or vagina, and is taken into the uterus during insemination. It is an opportunistic organism in that it becomes a problem in nutritionally and environmentally stressed cattle. Using the protected sheath or double-rod technique of insemination has been helpful in controlling the transfer of *ureaplasma* into the uterus. *Mycoplasma bovigenitalium*, *Hemophilus somnus*, and the bovine herpes viruses, *infectious bovine rhinotracheitis* (IBR) and *infectious pustular vulvovaginitis* (IPV), are all known to cause vaginal and uterine infection. The protozoan, *Trichomonas foetus*, causes severe uterine infection. Although *trichomoniasis* is a classical venereal disease, all of these other organisms can be spread from cow to cow by natural service. Avoid the use of natural service when there is any indication of reproductive tract infection. Pets and wild animals can also be a vector for spreading many diseases through a herd.

CONCLUSION

A herd health program is critical in maintaining uterine health and identifying potential problem areas. Routine postpartum examinations will help to identify problems early so that effective therapy can be administered in problem situations. This was a brief review of the major factors that cause uterine infection. Usually several factors are involved when a herd problem exists.