



Chapter 38

Health Considerations: Herd Bulls

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Introduction

The importance of the herd bull to the reproductive performance and profitability of cow herds that utilize natural service cannot be overestimated. Health problems in a bull may range from decreased fertility in that bull resulting in low or minimal impact on the herd to, in the worst case, an infectious disease that could spread to the rest of the breeding herd, with disastrous results for herd fertility. For these reasons, the health of incoming and existing herd bulls is of utmost importance.

Herd Bull Diseases of Importance

Conditions that can affect bulls may be divided into two categories: 1) infectious diseases that may affect the herd beyond the bull's own fertility and 2) conditions that affect the bull himself and his ability to successfully breed cows.

Herd Conditions

1. **Bovine Viral Diarrhea (BVD).** BVD is a viral disease that has the potential to cause profound detrimental effects on herd fertility. BVD infections in pregnant cows may result in a wide range of clinical signs, including formation of persistently infected (BVDV-PI) calves, abortions, and birth defects. BVDV is also an immunosuppressive agent, and animals infected with BVDV are more susceptible to secondary infections.

Bulls can be infected with BVDV either transiently or persistently, usually with mild or non-existent clinical signs. They can serve as a significant source of BVDV exposure for cows and other cattle present on pastures. BVDV can be shed in the semen of persistently and transiently infected bulls.

2. **Trichomoniasis.** Bulls are the primary reservoir for trichomoniasis, a protozoal disease that is transmitted venereally. Tritrichomonas infections cause inflammation within the female reproductive tract, resulting in a failure to conceive, early embryonic death, or less commonly, abortion. Infected bulls,

Key Points

- Health problems in a bull may range from decreased fertility in that bull with low or minimal herd impact to, in the worst case, an infectious disease that could spread to the rest of the breeding herd, with disastrous results for herd fertility.
- Biosecurity may simply be defined as "practices employed to ensure new diseases do not enter the existing herd." This is a concern when herd bulls are purchased.
- Maintaining bull health from year to year depends a great deal on 1) supporting the bull nutritionally, 2) maintaining immunity, and 3) managing parasite loads.

especially older bulls, persistently harbor the organism in the skin of their penis and sheath. Cows are infected during the act of breeding and serve as a source of infection for uninfected bulls that breed them on the subsequent inseminations.

- 3. Leptospirosis. Several different strains of Leptospira, a bacteria, can cause late-term abortions and conception failure. One of these strains, Leptospira interrogams serovar hardjobovis, is "host-adapted," meaning it tends to persistently colonize organs such as the kidneys and reproductive tracts. While leptospriosis is not a venereal disease, bulls can harbor infections and serve as sources of infection (primarily via urine) for the rest of the herd. Non-host-adapted strains such as L. hardjo, L. pomona, and L. grippotyphosa can also cause illness (and in cows, abortions), but these strains are not carried long term by the affected animal.
- 4. **Vibriosis.** The causative agent of vibriosis is the bacteria Campylobacter fetus subsp. venerealis. The clinical and infectious aspects of vibriosis are very similar to those of trichomoniasis: the organism causes inflammation in the female reproductive tract, resulting in failure of conception or early embryonic death. Infected bulls are long-term carriers and serve as a reservoir for infection in the breeding herd.
- 5. IBR-Infectious Bovine Rhinotracheitis. IBR (or "red nose") is a viral disease often associated with respiratory diseases in younger cattle. It also is a cause of conception failure and abortions in cows. IBR is another illness that may be passed from bulls to cows (and vice versa), although not via breeding.

Conditions primarily affecting the individual bull

 Johne's disease. A chronic and progressive bacterial disease, Johne's is significant in bulls because of their potential role in bringing this disease into a previously non-infected herd. Animals affected with Johne's typically will begin to show clinical signs (wasting and chronic diarrhea) only after animals are several years old, with death a frequent outcome of animals showing signs. In spite of this, young calves are the age group most susceptible to infection and may be exposed to Johne's on pasture by bulls or cows shedding the organism (usually by animals with clinical signs).

- 2. Lameness due to injury or infection. Musculoskeletal injuries resulting in lameness, often as a result of fighting, are not uncommon in multiple-bull pastures. In addition, foot rot, or interdigital dermatitis, can affect bulls frequenting areas such as stock dams or waterways. Besides the obvious detrimental effect on a bull's locomotion, pain and stress associated with these ailments decreases sperm production through the effect of excess cortisol on testosterone production.
- 3. **Pinkeye.** Bulls are visual breeders (they depend on vision to follow the herd and identify cows in heat). Infectious bovine keratoconjunctivitis (IBK, or "pinkeye") not only will affect a bull's vision but also is a source of pain and stress for the animal.
- Vesiculitis. The seminal vesicles, glands located 4. within the bull's pelvis, contribute seminal fluid to the ejaculate. Inflammation of these glands, termed "seminal vesiculitis," may be detected in bulls - especially younger bulls presented for breeding soundness examinations. This inflammation usually stems from a bacterial infection entering the gland from the bloodstream (as a consequence of rumen acidosis, liver abscesses, or infection elsewhere in the body). The presence of pus in the ejaculate means these bulls are not fit for breeding. Young bulls with vesiculitis often respond to antibiotics or a period of sexual inactivity, but in older bulls this condition is usually chronic and unresponsive to treatment.
- 5. **Other conditions.** Any illness resulting in fever for a prolonged period of time may depress semen quality. In addition, infections due to Gram-negative bacteria anywhere in the body may depress sperm formation due to release of endotoxins into the bloodstream.

Substances such as gossypol (a common

component of cottonseed meal) and zearalenone (a toxin produced by certain molds in certain feeds) may have detrimental effects on sperm production. Although data is very limited, there is no evidence to suggest routine antibiotics, nonsteroidal anti-inflammatories, or parasiticides have effects on semen quality.

Biosecurity Concerns for Producers Buying Bulls

Biosecurity may simply be defined as "practices employed to ensure new diseases (or strains of disease causing agents) do not enter the existing herd." A biosecurity program for cow-calf operations may be divided into pre- and post-purchase considerations.

Pre-purchase information

Just as a bull's EPD or genetic makeup is important to the future calf crop, a bull's health history or herd of origin is important to the future health of the herd. The health aspects that are important depend on what level of herd health the buyer seeks. For example, a buyer who has a Johne's testing program in place on his/her operation will by necessity be concerned with the Johne's status of the animal he/ she is purchasing. Other factors, such as BVD-PI animals, are important to keep out of the herd no matter the circumstance.

When assessing the health status of incoming animals, oftentimes the test status of the herd is more important than the test status of the individual animal. Certain diagnostic tests, such as the current blood tests for Johne's disease, have low sensitivity in detecting individually infected animals. However, when that test is applied to many individuals in the herd, the chances are greater that at least one infected animal will be detected (and the herd therefore identified as Johne's-positive). An individual animal originating from a Johne's infected herd, even an animal that tests negative after its herd has been diagnosed as Johne's-positive, is at risk for clinical illness later in life. For other diseases, such as BVD-PI status, individual testing is quite sensitive and should be applied to individuals entering the herd.

Questions to ask pre-purchase:

- What herd testing is being done in the herd on a regular basis? Examples of testing to look for include herd status in the voluntary Johne's Control Program, ear-notch testing for BVD-PI, or Tritrichomonas testing of bulls.
- 2. What testing has been performed on the individuals for sale? Examples include ear-notch BVD-PI testing, Tritrichomonas testing (required for non-virgin bulls before sale), or Johne's disease (with consideration of testing limitations as explained above).
- 3. What is the vaccination program for herd animals? Proper vaccination programs for bull calves start before they are weaned and continue on an annual basis. For reproductive diseases, pre-breeding vaccination provides more timely protection than vaccination after breeding has commenced.
- 4. Has a breeding soundness examination (BSE) been performed? A BSE that meets the minimum qualifications outlined by the Society for Theriogenology is the best evidence of the semen quality and breeding soundness of the purchased bull.

Postpurchase procedures that ensure bull health

- 1. **Isolation.** Incoming bulls should not be exposed to the resident herd immediately. Rather, incoming bulls should be placed in isolation. Considerations about both the facility used and the isolation time period should be given:
 - a. Facility considerations. Any appropriatesized pen or building could be used as an isolation facility, provided there is no possibility of nose-to-nose contact with existing herd animals, including shared water or feed sources. Generally, longer distances are better than shorter distances, although most important cattle diseases do not travel long distances through the air. Some conditions are transmitted via the fecal-oral route, so isolation facilities should not drain into spaces that the existing herd has access to, or vice versa. Equipment such

as tractors and skid loaders should not travel between isolated animals and the existing herd without being thoroughly cleaned and disinfected.

- Time period considerations. In general, b. an isolation period of 30 to 60 days is adequate for an incoming bull to recover from any transient (temporary) shedding of disease agents, for testing procedures to be completed, and for vaccinations to become effective. Stress of transportation may allow once dormant infections, such as IBR virus, to be re-activated. It's important to realize that for some persistent conditions, such as BVD-PI or infection with Lepto hardjobovis, any amount of isolation time will not be long enough-these conditions need to be addressed through diagnostic testing or treatments.
- 2. **Disease testing.** During the isolation period, samples for diagnostic testing should be taken and animals not allowed entry into the herd until negative test results are received. Testing new bulls for disease conditions needs to be planned and considered carefully. If a bull tests positive for Johne's disease, for example, and the purchaser elects to keep the animal to enter the breeding herd anyway, testing is a wasteful exercise. Examples of tests that could be employed during isolation are similar to those discussed in pre-purchase testing above.
- 3. Vaccination. The vaccination status of new bulls should match as closely as possible – or exceed – that of the herd they will enter. Vaccinations such as pre-breeding shots or intranasal IBR-PI3 may be considered, depending on the time of year and current herd practices. Knowledge of the bull's prior vaccinations and consultation from your veterinarian will help guide this practice.
- 4. **Treatments.** The carrier state of Lepto hardjobovis may be reduced by administration of a dose of long-acting tetracycline. New bulls should be treated with parasiticide products appropriate to the time of year before they are mixed with the breeding herd.

5. **Breeding soundness exam (BSE).** All bulls should be submitted to a BSE prior to the breeding season. New bulls should be evaluated if they were not tested prior to purchase, if it has been an extended period of time since the last BSE, or if the bull has been injured since the last BSE.

Herd Bull Maintenance

Maintaining bull health from year to year depends a great deal on 1) supporting the bull nutritionally, 2) maintaining immunity, and 3) managing parasite loads.

- Vaccinations. Herd bulls are members of the breeding herd, too, and they can play a prominent role in disease transmission. Therefore, bull vaccinations are just as or more important than the vaccination of the cow herd. Ideally, vaccines should be administered 30 days prior to turnout to the breeding pasture.
 - a. Viruses. Common viral vaccine combinations include BVDV, IBR, PI-3, and BRSV. Killed or modified live vaccines (MLV) are available. In general, MLV vaccines stimulate a broader immune response and can be expected to be effective after a single dose, as compared to killed virus vaccines. To date, there is no evidence to suggest that the administration of MLV vaccines to bulls has any detrimental effect on semen quality.
 - b. Leptospirosis*. Five-way leptospirosis bacterins are common and important components of many prebreeding vaccines (as bulls can become infected on pasture and assist the transmission of leptospirosis). Vaccines that include *Lepto hardjo-bovis* are widely available and should be strongly considered as well.
 - c. Vibriosis*. Vaccines against vibriosis are considered effective in preventing, and possibly also in clearing, infections from bulls. Vibriosis is commonly included in pre-breeding vaccine combinations.
 - d. Trichomoniasis. Unlike vibrio vaccines,

vaccines against trichomoniasis are not effective in prevention of infection. Their role is limited to use in already-infected herds as a means to improve pregnancy rates. Trichomoniasis vaccines are not a substitute for measures to keep this disease out of a herd or to eliminate it from a herd.

- e. Pinkeye*. Because of the severe potential effect of pinkeye infection in a herd bull, vaccination should be considered. Protection from pinkeye infections is strain-dependent, and vaccine failures are not uncommon. For this reason, fly control measures such as insecticide tags, rubbers, or pour-ons are also important.
- f. Foot rot*. For bulls in some pastures, foot rot vaccine (against *Fusobacterium necrophorum*) may be considered. Foot rot, like pinkeye, is a multi-factorial disease, and other control measures, such as attention to muddy conditions, should be employed.

* Leptospira spp., Campylobacter fetus subsp. venerealis (vibriosis), Moraxella spp. (pinkeye), and Fusobacterium (foot rot) are Gram-negative bacteria. Avoid vaccinating an animal at the same time with more than two vaccines containing these antigens. Using three or more vaccines that contain gram-negative bacteria has the potential to result in excessive levels of endotoxin delivered to the animal—a condition that could result in impaired semen quality or illness in bulls.

2. **Parasiticides.** Treating bulls for internal parasites prior to entry onto the breeding pasture will reduce the bull's parasite load and decrease the amount of worm eggs deposited onto the pasture. Bulls and cows should be treated at the same time. In the fall or winter, a product that treats for external parasites (biting and sucking lice) should also be given.

Summary

Bulls are of critical importance to the reproductive outcome of the cow-calf enterprise, and need to be in optimal health for their best performance. Also, bulls most likely represent the most frequently added animal from other herds, therefore representing a potential source of new disease agents for a herd. Paying attention to health decisions before and after a bull is purchased—and close consultation with a veterinarian—will help ensure that bulls do not become liabilities to the herd.

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