Herd Health Maintenance

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On the cover: The rough coats on these calves are signs they have been grazing on endophyte infected fescue pasture. Several steps can be taken to overcome the endophyte impact on herd health.
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A healthy cow/calf herd is a reflection of a sound management program designed to prevent health problems before they happen.

Disease prevention is of utmost importance in a cow-calf operation because it is a low-profit-margin enterprise. Adequate nutrition, strategically timed parasite control, a well-designed vaccination program and proper sanitation are all necessary to maintain herd health.

Consult with one or more veterinarians about designing a general herd health program. A local veterinarian is often the best source for health procedures that are needed in the particular area. A local veterinarian knows how to fit the herd health program to the type of management and problems associated with your farm and in your area.

This chapter addresses events as they occur in the life of a beef animal. The discussion begins with the neonatal (newborn) calf and progresses through breeding cows and bulls. A section discussing diseases applicable to all ages follows the age-specific sections. The drug and vaccine usage section addresses how to ensure that you are selling a high-quality product.

The last section is devoted to a programmed approach to health maintenance by animal age and function.
Buying healthy breeding stock

Disease problems are less likely to occur when a herd is maintained as a closed herd and replacements are added from the home herd. The next best option is to purchase animals from one source. Diseases are more likely to occur if animals are obtained from several sources because herds may have unique diseases or conditions. Mixing and mingling young animals often results in the spread of disease organisms because many of the animals will not have had a chance to develop immunity.

Diagnosing disease

When purchasing animals, obtain a history of the source of cattle. Gather as much information as possible on which diseases have occurred and about the herd health program used.

When animals have been ill for some period or have received various medications, it may be difficult to determine which organisms are causing the ailment. Consult your local veterinarian. The University of Missouri College of Veterinary Medicine Diagnostic Laboratory also is available to help veterinarians diagnose diseases. Sick or recently dead animals or tissues obtained from dead animals may be submitted for laboratory examination. The laboratory’s up-to-date diagnostic capabilities permit treatment or preventive measures that are specifically designed for your herd.

The neonatal calf: Birth to one month

At birth, remove mucus from the calf’s nose and mouth. Place the calf in an upright position resting on the sternum and rigorously massage the calf to initiate breathing.

Newborn calves that become chilled may be revived by placing them in warm (95°F to 98°F) water. Cover the entire body except the head with water during the “thawing” process. You also can place calves in a 4-ft. by 4-ft. plywood box that has a heat lamp attached to a thermostat set at 98°F.

Administer 2 quarts of colostrum within two hours or as soon as possible. Frequently, the colostrum milk needs to be given with a nipple bottle, stomach tube or esophageal feeder. As soon as the calf revives, return it to its dam. Carefully observe the calf to ensure it suckles its mother.

Pasture-born calves experience fewer health problems. Proper management will keep calves growing strong, increasing your calving percentage.
The colostrum is the calf's source of antibodies and vitamins. Calves deprived of colostrum during the first days of life have higher sickness and death rates. Fresh or refrigerated colostrum is best. However, frozen colostrum can be used if none other is available. It can often be obtained from a dairy and kept frozen for six months. One-quart, self-locking plastic freezer bags placed on a flat tray can be thawed quickly with little waste. Colostrum from an older cow will be more likely to contain a broad spectrum of disease antibodies.

If the calf doesn't receive colostrum in the first 24 hours of life, the next best procedure is to give oral antibodies available from your local veterinarian or to give a plasma transfusion from a cow. A colostrum-deprived calf should receive injectable antibiotics and vitamins A, D and E.

Calves dropped in pasture frequently have fewer disease problems than those dropped in buildings. Newborn calves should be observed closely during the first two weeks of life. Early detection of disease and treatment are very important.

Agents that are commonly associated with scours in calves are E. coli, Salmonella, and Clostridium, all bacteria and the viral agents, rotavirus and coronavirus.

Colibacillosis (caused by E. coli and commonly known as white scours) can occur during the first two months of life. Calves deprived of colostrum are especially susceptible because colostrum has a high content of antibodies against E. coli. The younger the affected calf, the more severe the diarrhea. During the first week of life, colibacillosis is likely to be fatal. Calves with colibacillosis usually have rear quarters that are pasted with fluid or liquid feces. The stool has a foul odor and is white or gray in color. Affected calves become weak, dehydrated and may have a fever.

Calves born on pasture have fewer scour problems than those that spend time in buildings. The problem is most common among calves of first-calf heifers because they are frequently confined so that obstetrical assistance can be given more easily.

Prevention is much more practical than treatment. Sanitation and cleanliness are important if calves are kept in buildings. Colostrum soon after birth is very important. It may help to vaccinate cows with a commercial or autogenous E. coli bacterin.

Diarrhea caused by Salmonella will usually have blood mixed with the feces. Rotavirus produces diarrhea after the first week of a calf's life. Coronavirus infection is more prevalent at one to six weeks of age.

There is no treatment for a specific viral diarrhea. In general, treatment for most diarrheas is to replace the fluid lost by the liquid feces and to control secondary bacterial invaders. Good nursing care is important.

Preventing calf scours entails several management procedures. Winter feeding pastures should be rotated yearly. Hay should be fed on new ground each day and placed so that rainfall and melting snow does not carry debris and manure from previous feeding areas to the fresh hay.

Cows should be moved to a calving pasture about one to two weeks before calving (50-100 cows per 15-20 acres). Rotate calving pastures yearly.
Remove the cow and calf to a nursing pasture within 24 hours after calving. Leave them on the nursing pasture for four weeks (35 cows and calves per 10 acres). Add nursing pastures as needed. These procedures will reduce the buildup of scour-causing microorganisms, keep cows and their udders cleaner and keep calves of similar age and size together.

There is a vaccine against rotavirus and coronavirus. It should be given in the first few hours of life prior to the calf receiving colostrum. Cows vaccinated with vaccines against colibacillosis, rotavirus, coronavirus, IBR and/or BVD will supply antibodies in the colostrum, which should increase protection for the young calf.

Pneumonia

Although respiratory problems cause a great percentage of newborn calf deaths, there is no single organism that can be attributed to the problem. Often, pneumonia in the newborn results from the calf having been ill with calf scour. The calf weakens, its body defenses are compromised and pneumonia develops. Specific vaccines are not available to prevent neonatal calf pneumonia. Prevention is best accomplished by keeping scour to a minimum, maintaining the calf in a dry environment and providing good ventilation if the calves have access to buildings.

Clostridial disease control is economically important to the cattle producer. These diseases are infectious but are not contagious. Clostridial organisms are found in the soil and therefore are part of the normal bacterial population in the digestive tract of healthy animals. These organisms multiply only in the absence of oxygen. Therefore, most clostridial diseases attack muscle or liver tissue. The organisms are resistant to weather and disinfectants.

These three clostridial diseases are quite similar as they affect primarily the muscles of the animals. They cause large numbers of cattle deaths each year. Usually, only one or a few animals are affected in a herd. Animals are frequently found dead.

Blackleg usually occurs in cattle six months to two years of age. Prominent early signs are stiffness and lameness. Pockets of gas frequently form under the skin of the shoulders and a crackling sound can be heard when the skin is rubbed.

Malignant edema is similar to blackleg except that the affected tissues are swollen and filled with fluid. Malignant edema may occur in cattle at an older age than blackleg.

Cattle with sordelli usually do not have the high fever associated with blackleg or malignant edema. Death is usually so sudden that the gas formation and tissue swelling does not occur until just before or after death.

Early treatment with penicillin, injected intramuscularly, might be worthwhile. Realistically, however, response to treatment occurs in only a small percentage of cases.

All calves should be vaccinated against the muscle clostridial diseases such as blackleg, malignant edema and sordelli at one to six months of age. The bacterin "four-way" is inexpensive and effective.
Calves receiving a vaccination before six months of age should be re-vaccinated at six to eight months. Purchased cattle less than 2 years old should be vaccinated unless there is proof that they were vaccinated as calves. There have been reports of a hypersensitivity condition occurring when cattle have been repeatedly vaccinated with the clostridial bacterins. As cattle move through the marketing channels and change ownership several times, they are often vaccinated without regard to previous vaccination history even if it is known. Always attempt to obtain a vaccination history of purchased cattle. Avoid multiple vaccinations of cattle with clostridial bacterins if possible.

Black disease is a clostridial disease that primarily affects the liver. The liver is destroyed to the extent that it becomes black: the red blood cells are destroyed. Very few signs are apparent in live animals because death is so sudden.

Cattle producers can help prevent the disease by administering a vaccination with a multivalent clostridial bacterin. The “four-way” and “seven-way” clostridial bacterins prevent these clostridial liver diseases. Use the same recommendations as for the clostridial muscle group bacterins.

IBR is a viral disease that is often associated with bovine respiratory disease complex (shipping fever). Cows exposed during pregnancy may abort. The three forms of this disease are respiratory, genital and conjunctival.

Respiratory IBR produces a heavy nasal discharge, open mouth breathing, high fever and drooling saliva. Membranes lining the nose are red and inflamed giving rise to the term “rednose.” Genital IBR is also called IPV or Infectious Pustular Vaginitis. The vagina develops blister-like nodules and a yellowish creamy discharge. The virus may produce inflammation of the sheath and penis of the bull. Conjunctival IBR, or the eye form, resembles pinkeye.

Calves should be vaccinated against IBR near weaning. Replacement heifers should receive another vaccination three to four weeks before breeding. Cows vaccinated while open will offer greater protection to the calf by way of the colostrum. However, these maternal antibodies may persist in the calf and can interfere with response to vaccination until after weaning. Cows vaccinated with a modified live IBR vaccine within three weeks of breeding may have reduced fertility and pregnant cows may abort. Inactivated IBR vaccine should not cause these problems.

BVD may appear as a mild, acute or chronic disease. Diarrhea may be present in the mild or chronic forms. The acute form generally produces a high fever and severe diarrhea. The symptoms may resemble IBR or shipping fever.

This virus may also cause abortions. Some calves are born with brain damage because of the exposure to the BVD virus before they are born. Pregnant cows with BVD may have calves infected with BVD virus. These calves are normal at birth but are unable to produce immu-
nity to the virus when vaccinated. These calves, if saved as replacements, may serve as a source of the disease for the rest of the herd.

Response to treatment has been disappointing.

The IBR and BVD vaccines are available in different forms, such as modified live virus, inactivated virus or chemically altered virus. They are available for injection, or some IBR vaccines may be applied into the nostrils. You should consult with your veterinarian about which vaccine to use in your herd.

Bovine Respiratory Syncytial Virus (BRSV) is a viral disease that may not be apparent, yet occasionally causes major respiratory outbreaks in feedlots. Calf body temperature is very high early in the disease and may be missed in naturally occurring cases. Coughing and decreased feed consumption are early signs. Many calves may recover rapidly.

Calves that develop a severe form of the disease have steadily increased breathing difficulty. Fluid accumulates in the lungs. They may have foamy saliva around the mouth and extend their tongues in an effort to breathe. Treatment involves injections of anti-inflammatory drugs, and often a feed change helps. Veterinary diagnosis is important. A vaccine is available for use in calves before weaning or prior to feedlot entry.

Bovine Respiratory Disease Complex (BRDC) is another name for this cattle respiratory disease. It primarily affects cattle near or after weaning when they are moved or otherwise stressed. The causes are thought to be a complex interaction between viruses, bacteria and stress factors such as weather, livestock movement or change of environment. In addition to viral involvement, the bacterium Pasteurella is generally present. Although the disease is considered to be infectious, the spread of BRDC from calf to calf is not too high.

Disease severity ranges from mild to severe and can be fatal. Antibiotic treatment, if given early, is often effective. Treatment when the animal is having visible respiratory problems may be ineffective. BRDC control and treatment are enhanced by a vigorous management program of newly purchased calves or calves stressed by weaning, movement, overheating, chilling, ration change, castration, dehorning, and by commingling with cattle from outside sources.

Several management programs for incoming cattle have been developed. They incorporate palatable rations, access to fresh water and reduced stress to the newly arrived calves. Systematic treatment and identification of sick animals and good record keeping is helpful. Vaccination against the various viral respiratory disease organisms and Pasteurella have been used with varying degrees of success.

Pinkeye affects a large number of cattle each summer. Economic losses are great when we consider the weight loss and decreased production that often accompany pinkeye. Calves are generally the most susceptible animals in the herd.

The principal cause of pinkeye is the bacterium Moraxella bovis. IBR or rednose virus may also cause a similar condition. After initial infec-
tion, other bacteria grow in the inflamed eye. Bright sunlight, dust, pollen from weeds and grasses and vitamin A deficiency contribute to the susceptibility and severity of the disease. Recovered animals may be pinkeye carriers. The microorganism may overwinter in the nasal passages of the cows and become active in the spring. Face flies feed on discharge from the eyes and the pest spreads the disease to other animals. Nasal and eye discharges from affected calves are easily transferred to other animals when handling cattle for treatment or routine vaccination.

The first sign is a watery discharge that progresses into a yellow and thick discharge. One eye is frequently infected and about the time it heals the other eye may become infected. The condition often lasts for three to four weeks. Some animals may be temporarily blind. However, most of them regain their vision in at least one eye.

Prevention and treatment are difficult. You can reduce pinkeye severity by reducing face fly numbers, reducing exposure to dust, clipping tall pastures to prevent eye irritation and providing shade from intense sunlight. Vaccinations with pinkeye bacterins have been used in some herds with varying degrees of success. Consult your local veterinarian concerning recommendations.

Early treatment seems to be of some value. Several antibiotic preparations are available. The injection of steroid and antibiotic into the eyelid may reduce the severity of the disease.

This nervous system disease results from a thiamine (a B vitamin) deficiency. Intake may be adequate, but conditions in the rumen may reduce the amount of thiamine available. Ingestion of certain plants, some coccidial drugs and high-energy rations have all been associated with reduced thiamine availability for the ruminant. The brain tissue is affected and depression, stupor and blindness often occur. The condition can be prevented by ensuring proper ration composition. Feed analysis can be used to formulate rations. Adding thiamine to the ration may be necessary.

This is an infectious nervous system disease caused by a bacteria in the brain. Death usually occurs suddenly, although there may be swelling in some joints, lameness and/or depression and stupor early in some cases. Antibiotic treatments must be administered early to be effective. A bacterin is available that has reduced the disease incidence.
Cows: Reproductive management

Annual physical

The beef cow is the basis of a cow-calf production unit. She should receive regular attention including an annual physical examination. This examination will help you decide on which cows to retain, which to cull and/or which need extra attention before the calving and nursing season.

The examination should include pregnancy examination with special attention to the teeth, body condition, eyes, udder and feet. Poor teeth will reduce body condition and may result in lower milk production. Bad eyes or those with the malignancy “cancer eye” can limit the cow’s productive capability. Udders with chronic mastitis or a nonfunctional quarter will likewise reduce the cow’s ability to raise a viable calf. Feet with corns or that need trimming will limit her mobility and subsequent milk production.

The best time for the annual examination is about two months after the breeding season ends. This allows time to decide which cows to keep and time to make other management changes before the calving season begins.

Estrus detection

Crossbreeding and herd improvement have increased the use of artificial insemination of beef cows. This practice requires the detection of heat or estrus. The estrous cycle (period between heat periods) of the cow averages 21 days, although heifers average 20 days. The range can be from 17 to 24 days. The average cow will be in standing heat for 14 hours, but the period may vary from four to 24 hours. Signs for detecting heat include:

- Standing when mounted by other cattle.
- Mounting other cattle.
- Raising the tail, acting nervous, roaming or bawling.
- Appearance of clear mucus on the vulva and tail.
- Enlargement or swelling of the vulva.
- Appearance of bright red blood on the vulva, which frequently occurs 12 to 48 hours after estrus. Watch for the next heat 16 days after the appearance of bright red blood.

There are several methods to help detect estrus. They are only aids and should not replace close observation. Aids include:

- Gomer bulls — bulls that have their penis shortened or altered so it protrudes to one side — an operation requiring a veterinarian.
- Gomer steers or cows that have been injected with testosterone.
- A chin ball marker attached to Gomer bulls, steers or cows. The marker holds a reservoir of ink, which leaves a mark on cows that are mounted. Results with chin ball harnesses have been variable. Estrous synchronization can also be a valuable aid for estrus detection. See MU publication M149, Reproduction, for more information on estrous synchronization, artificial insemination and embryo transfer.
Calving ease is an important asset in a cow herd. Large, heavy-boned cows are more susceptible to calving problems. Certain strains or families within a breed are subject to greater prevalence of calving problems. These problem families should be avoided or discontinued. Calving data are available on some bulls and breeding animals. See MU publication G2035, *Calving Difficulty in Beef Cattle*.

Watch the herd closely during the calving season. Older cows frequently calve on their own. Daily observation is usually sufficient for them. Heifers should be observed at least three times daily. As calving time approaches, place heifers in a small pasture or holding area near a barn or a structure with catching facilities. Observing heifers closely and keeping them where they may be caught often makes the difference in saving calves. Consider mating heifers to a breed of bull that has a lower birth weight. The calves may be less growthy, but a small, live calf is better than a large dead one. Heifers can also be damaged while giving birth to a large calf.

Calving equipment and supplies should be ready before the season starts. Proper equipment includes two 60-inch obstetrical chains, hand hooks and a mechanical calf puller — provided the owner is knowledgeable about their use and recognizes the dangers in using this equipment.

Other supplies include obstetrical lubricants, at least two buckets for water, paper towels and a bottle of iodine for disinfecting the navel cord. Avoid using liquid soap for a lubricant because it is irritating to the cow’s reproductive tract and can reduce conception at breeding. It may be used for cleaning the external vulva of the cow.

If the weather is not too severe, calves dropped in a pasture are less apt to have scours and other diseases. A maternity stall, if used for cows calving inside, should be cleaned and disinfected after every calving.

Close observation usually reveals when the cow or heifer is close to calving. Just prior to calving, the cow becomes nervous, her udder enlarges rapidly and she will leave the rest of the herd. After the cow goes off by herself, she should be observed at least every hour.

The water bag is the first thing to appear. In normal calving, the two forefeet come first and then the nose appears between and on top of the feet.

Calves occasionally come either hind feet first or in breech position. After the birth process begins, a calf will usually remain alive 6 to 12 hours as long as the umbilical cord is intact and blood and oxygen are being supplied by the mother. Calves born in the breech position may rupture the navel cord and smother to death because they are unable to breathe while they are inside the cow. Once delivery starts, assistance is often necessary in breech deliveries to prevent the calf from smothering.

If calf delivery is difficult, call your veterinarian before too much damage is done to the cow and the calf. Reduced conception rates and increased calf death rates occur because of damage to the cow or calf from excessive force at calving.

Herd Health Maintenance
The common causes of dystocia, or calving problems, are:
- Calf too large.
- Pelvic area too small.
- Breech delivery.
- Leg or head turned back.
- Front leg folded or flexed.
- Posterior presentation.

Heifers seem prone to calving problems due to the calf folding one or both front legs. One leg should be pulled at a time to extend them. Delivery is easier if one foreleg is advanced at a time until the shoulders clear the bony pelvic cavity. The diameter of the pelvis is greater from top to bottom than it is from side to side. Thus, hip lock can often be avoided if the calf is rotated so that the stifles are at the bottom and the top of the pelvis. The direction of pull should be down or toward the cow’s hocks when delivering the hind quarters of the calf. More information can be found in MU publication G2007, Assisting the Beef Cow at Calving Time.

Reproductive diseases

A cow that produces a calf every 12 months is of great economic importance in the beef cow herd. The basic goals in a herd reproductive health program are to:
1. Identify cows and calves and keep records on calving and breeding dates.
2. Develop a breeding season.
3. Maintain sufficient bull power.
4. Use breeding soundness examination (BSE) information when buying new bulls. See MU publication, M149, Reproduction, for more information on bull breeding soundness exams.
5. Conduct BSE on all bulls 15 to 30 days before the breeding season.
6. Observe breeding activity during the breeding season.
7. Design a reproductive herd health program with a veterinarian if breeding problems occur.
8. Cull cows that fail to conceive during the breeding season.

Poor nutrition, especially an energy deficiency, is frequently a cause of cows not cycling at 60 and 90 days after calving. This is particularly true of the first-calf heifer. She has a high demand for energy to supply milk, maintain growth of her own body and to reproduce. See tables in the section entitled Cow/Calf Nutrition for nutrient recommendations.

When culling cows due to a poor calving interval, remember that a few cows normally will become open after they appear to be pregnant. For some reason, a small percentage of embryos die during gestation. Research has indicated an embryo death rate of 0.5 percent per month. At this rate, six cows out of a 100 would conceive and then become open sometime during the pregnancy period.

The following diseases, many of them contagious, can also cause embryo death or calf abortions.
Testing and slaughtering has greatly reduced the incidence of this reproductive disease. However, take precautions to keep your herd free of this costly and troublesome disease. Brucellosis can also be contracted by humans as "undulant fever." Brucellosis or "Bangs" is produced by bacteria that may be contacted by oral ingestion.

Signs of the disease in cattle are abortions, weak calves, failure to settle, faulty cleaning and decreased milk production with no apparent signs of sickness.

There is no cure for brucellosis. Slaughtering an infected herd is your only choice. Testing an infected herd and culling in order to obtain a clean herd is often disappointing. Reactors frequently are found after the herd is thought to be brucellosis-free.

Vaccinating heifers at the recommended age may be helpful. Strain 19 vaccine provides about 65 percent protection. Contact your local veterinarian for current state and federal recommendations.

Vibriosis is a venereal disease spread during breeding. Vibrio organisms are deposited in the vagina, where they spread to the rest of the genital tract and kill the developing embryo. Death of the embryo occurs without signs of disease. The heat cycle may be normal or a longer period of time may intervene between heat periods depending on when the embryo dies. Rebreeding several times is often necessary before the cow conceives. Abortion may occur if the embryo survives long enough. Usually, cows suffer infertility rather than abortion.

Infected cows usually recover and become normal breeders after a normal pregnancy is obtained. However, a few cows will carry the infection through gestation, deliver a normal calf and then infect bulls in the next breeding season. The length of time that an infected bull can transmit the disease is variable.

An effective vaccine is available. Vaccinate bulls, cows and heifers. Frozen semen from most commercial bulls is treated to destroy vibrio microorganisms.

This venereal disease is transmitted by sexual contact. It also can be spread by mechanical means. Trichomonads survive the semen processing methods, so the disease can be spread via artificial insemination as well as through natural breeding. Infected bulls show no signs of the disease. During the breeding process, trichomonads are deposited in the vagina. During a period of days or weeks, the organisms produce enough inflammation to kill the developing embryo. The usual duration of trichomonad infections is three to five months.

Signs of Trichomoniasis and Vibriosis are quite similar. Seek veterinary assistance if you suspect either of these diseases. Laboratory testing is necessary for a definite diagnosis. These diseases are spread by the bull and are difficult to cure. Infected females recover with time and reproduce normally.
Leptospirosis

This bacterial agent produces abortions, stillbirths, weak calves and deaths in nursing calves. Abortions may occur as early as the third month of gestation, but they more frequently occur after mid-gestation. A diagnosis may be made by isolating leptospira bacteria from the urine or aborted material. A blood test for antibodies can determine if cows in the herd are being exposed to the leptospira bacteria.

The bacteria live for some time in water. Infected animals shed the bacteria in urine for weeks or months following infection. Rats, skunks, raccoons and other wild animals may be carriers and be sources of infection to cattle. During recent years, different strains of the leptospira organism have been identified in domestic animals.

Vaccination with a multivalent (several strains) leptospiral bacterin is probably a sufficient preventive on most farms. However, immunity from leptospira bacterin lasts less than one year. If exposure is great, you may need to vaccinate every six months. Ask your veterinarian how many strains of leptospira should be included in the vaccine.

Abortions may be caused by Listeriosis, IBR or rednose virus, BVD virus, mold infections, vitamin A deficiencies, nitrate toxicity, anaplasmosis and other unknown causes.

Anaplasmosis

Anaplasmosis is produced by a microscopic parasite that destroys red blood cells of cattle. The incidence is increasing and, in most cases, appears in late summer and early fall. Practically all clinical cases occur in older cattle. The disease is usually mild and not noticed in calves and yearlings.

Signs of the disease include rapid breathing and paleness of lips, nostrils, mouth lining and other mucous membranes. Infected animals lose weight rapidly, become constipated and may become belligerent.

Anaplasmosis is spread by blood-sucking insects and by dehorning, tattooing and other surgical procedures. Less than a drop of blood is necessary to transmit anaplasmosis to a susceptible animal. Recovered animals remain carriers for life. The carrier state may be eliminated with large or prolonged doses of antibiotics.

Horse flies, mosquitoes, horn flies, ticks and stable flies are the principal blood-sucking insects that spread anaplasmosis. Horse flies are probably the most frequent carriers. Early treatment by a veterinarian is often beneficial. Blood transfusion and antibiotics are beneficial during early stages of the disease.

A vaccine is available for controlling clinical signs of anaplasmosis. The vaccine protects cattle from an acute attack, but it does not stop infection nor prevent the carrier state. In the beginning, two injections, four to six weeks apart, are given. A single annual booster shot is necessary to maintain resistance. There is no danger from mixing vaccinated and unvaccinated animals. However, a very small percentage of vaccinated cows develop antibodies against the blood of their own calf. These calves may die from red blood cell destruction caused by their dam’s antibodies passed to the calf through the colostrum. Therefore, you should discuss the vaccination program with a veterinarian.
Another control method is to test the herd for anaplasma antibodies in the serum. You can then: (1) divide the herd into positive and negative groups and keep each on separate premises; (2) sell animals that test positive; or (3) treat animals testing positive with antibiotics to clear the carrier state.

Treatment to clear the carrier state requires injections of 5 milligrams (mg) of tetracycline per pound of body weight for 10 to 14 days, or chlortetracycline at 5 mg per pound body weight may be given in feed for 45 days. Another method of control is to provide chlortetracycline in the feed or salt at 0.5 mg per pound of body weight daily during the insect vector season. Getting the cow to consume enough antibiotic daily may be a problem with this method.

Squamous cell carcinoma, or cancer eye, may originate on the eyeball or the eyelids. This condition usually occurs in cattle 6 years of age or older. Cattle lacking pigment in the eyelids are most susceptible. Exposure to sunlight, dust and other irritants appears to increase disease incidence. Close observation, early detection and early treatment by surgical procedures are helpful. It is also a good practice to select breeding animals with high amounts of pigmentation in and around the eyes.

Grass tetany is due to a magnesium deficiency in the blood plasma. Signs are similar to those of milk fever. The incidence of grass tetany has increased with greater use of cool-season grasses. Cows that have calved during the past six weeks and are at the peak of milk production have the greatest incidence. Cows become more susceptible with age; most cases occur in cows beyond their fifth lactation period.

Weather that is cool, cloudy, windy and rainy appears to affect the grass and the cattle. At temperatures between 20°F to 40°F, grass is less
capable of assimilating magnesium from the soil. These weather conditions also are stressful to cattle.

Lush, rapidly growing grass may be deficient in magnesium. High potassium fertilization of the pastures appears to increase grass tetany occurrence. Recent research reports indicate that increasing phosphorus fertilization may reduce grass tetany. Contact your extension agronomist for further information concerning pasture fertilization and grass tetany.

Clinical signs are an excitable expression, erect ears, blindness and muscular twitches. The animal usually goes down. The animal may have a series of convulsions or it may die shortly after developing signs.

Early treatment without exciting and stressing the animal is essential. Follow-up treatment and care are important because recovered animals are subject to relapse. Grass tetany may be prevented with a salt mix containing magnesium. Equal parts of magnesium oxide, salt, bone-meal and dried molasses will supply sufficient magnesium under most conditions. Feeding alfalfa, clover or other legumes in the pasture or ration is a good preventive measure.

Bull health concerns

Bulls are the primary way venereal reproductive diseases, such as trichomoniasis and vibriosis, spread throughout the cow herd. Other contagious diseases may also be introduced into the breeding herd by the bull.

Most cow/calf producers purchase bulls from an outside source. You should obtain your bulls at least one month before your breeding season starts. Isolate the bulls (and any other animals being added to the herd) for one month to see if they are incubating any diseases.

Conduct a breeding soundness exam on bulls each year. Bulls may have reduced or abnormal semen after having frostbitten testicles during a cold winter. Some diseases also infect the testicle or male reproductive tract, which can reduce semen quality and quantity. Examine bulls well in advance of the breeding season so that new bulls may be found, purchased, examined and quarantined prior to entry into the herd. Bulls may contract and suffer from the same diseases that cows contract.
Acorn poisoning in Missouri occurs during the fall months. Extensive cattle losses occur some years. The incidence is sporadic. A farm may go for years without acorn problems and then suddenly have a year when poisoning occurs.

An outbreak of acorn poisoning was seen during the fall of 1974, a year that produced a heavy crop of white oak acorns. Cattle losses were extensive. Few if any cases occurred the following year when the crop was sparse. Cattle should be kept away from white oak acorns or closely observed if they have access to them. Calves and yearlings are most often affected.

Signs of acorn poisoning are: poor appetite, constipation followed by diarrhea, dark brown feces having an offensive odor and a tucked-up appearance of animals due to abdominal pain. Affected animals become depressed, drink water frequently and urinate often because of kidney damage. There is no effective treatment, and few animals recover.

More producers are adding legumes to grass pastures. The practice has become popular because of the rising cost of nitrogen fertilizer and because research shows that grass-legume mixtures give more economical gains than grass alone. Legume pastures can lead to problems with bloat, however. The occurrence of bloat is dependent on pasture management and the kind of growing season. Clover in a grass mixture usually presents no bloat problem if the clover content is kept at less than 50 percent of the mixture.

Poloxalene, a feed additive, is effective in preventing bloat due to legumes. Directions should be followed closely because results are much better if animals consume the required amount daily.

Lameness and sloughing of feet and tips of tails sometimes occurs in cattle grazing tall fescue. Endophyte in the fescue reduces blood circulation. The animal's feet, ears and tail are then susceptible to frostbite. That is why the highest incidence of fescue foot occurs during the winter months in Missouri.

Affected animals show severe pain and swelling of one or more feet. A hind foot is usually affected first. As the condition progresses, an indented line appears between the hock and dew claws. The line appears as though a wire had been tied around the leg. The affected foot or tip of tail is deprived of blood and will drop off if the condition is allowed to progress.

When cattle are grazing fescue, watch them closely, especially during winter months. Check for signs of stiffness early in the morning when they first get up. Consult a veterinarian for a definite diagnosis.

There is no treatment. You must detect infected animals early and remove the fescue from their diet if they are to make a complete recovery. Place these animals inside a building with straw bedding to protect their feet from cold. Feed them forages other than fescue. Some grain and vitamin A is thought to help animals recover from fescue foot.

Mixing legumes with fescue grass may help prevent fescue foot. Stockpiled fescue appears to be the most troublesome. Clipping or grazing to avoid rank growth may help prevent the disease. See MU publi-
cation M152, *Forage Management*, for more information on fescue toxicity.

Ergot can produce a condition similar to that seen with fescue foot. Animals should also be examined for foot rot or a foreign item in the foot.

**Foot rot**

Foot rot usually appears suddenly. The cow is extremely lame in one foot and stands on the other three. Appetite and production drop. Prompt treatment with sulfas and antibiotics will cure most cases. In some herds, foot rot will spread from one animal to others in the herd. This can require much time and expense to treat.

Foot rot often appears after an injury occurs between the claws or to the bulb of the heel and then bacteria enters the foot. There will be redness between the claws and a characteristic foul odor.

Pick up and examine the lame foot. Not all lameness is due to foot rot. The soreness may be due to a pebble lodged between the toes or a nail in the hoof.

Keep cattle out of mudholes as this may be a source of infection. Standing in water softens their skin making it more easily broken by stubble, rocks and other objects.

Response to treatment is usually good, especially if cattle are treated early. Sulfa drugs are good. Most cases respond to penicillin given intramuscularly. In addition to systemic treatment with sulfas or broad spectrum antibiotics, you should clean the foot and treat it with an appropriate anti-bacterial product. Consult your local veterinarian.

**Lumpy jaw**

There are two forms of this disease. One form infects the jaw bone or other bony tissues of the head. There is swelling and an abscess. Once the bone becomes extensively infected, the animal may live with treatment, but do not expect complete recovery.

The other form is similar but usually affects soft tissues and lymph nodes. It frequently affects the tongue of cattle and is known as "wooden tongue." This form responds to antibiotics.

Lumpy jaw disease often infects the bony tissue of the head, causing severe swelling and abscess.
Consult your veterinarian for a diagnosis of which form of lumpy jaw is present. Early treatment is important for best response.

Endophyte-infected fescue is associated with "summer slump." The condition occurs during summer. Cattle cannot shed their body heat, so they stand in water pools such as ponds or streams. They may create their own mud by urinating in a common area.

Affected cattle may stand on warm days and breathe with open mouths as if they are hot. They generally will have reduced weight gains and cows will often have lowered conception rates.

The signs occur more frequently on pastures with the highest amounts of endophyte-infected fescue plants. Severe cases of summer slump often occur in fescue pastures that have received high nitrogen fertilization. There is no treatment, and to prevent this condition you must reduce the amount of endophyte infection in the pasture. This can be done by interseeding clover in the pasture, reducing nitrogen fertilization or replacing the infected fescue stand with an endophyte-free variety. See MU publications M152, Forage Management, for details.

Warts are contagious and are caused by a viral agent. Vaccines are used in treatment and prevention.

There are different strains of wart viruses. You may need to try more than one vaccine before the virus is removed. Your veterinarian may be able to have a biological laboratory produce a vaccine made from material from the warts on your cattle.

Cattle suffering from summer slump often try to cool themselves by standing in water or under shade trees.
Cattle parasites

External parasites

Lice occur during the winter. They are small and hidden under the hair. It is important to treat cattle for them. The lice suck blood to exist, they reproduce and can cause anemia if they are present in large numbers. Adult animals are sometimes depleted of their blood supply to the extent that the least amount of exertion may cause death. In addition to red blood cell loss, animals also lose blood plasma, which contains antibodies against various diseases. Infested or "lousy" animals are then more susceptible to diseases.

Lice also produce irritation, driving cattle to rub on fences, buildings and other objects. Insecticides are available in spray, dip, pour-on and injectable forms. Carefully read and follow directions for use and withdrawal times.

In summer, face flies, horn flies and ticks are the main insect problems. Flies can be very irritating to cattle and result in lowered weight gains and contribute to eye problems.

Face flies are difficult to control. The four major means of fly control are spraying, pour-on, fogging and self-administration. Dust bags and insecticide-soaked materials may be beneficial but only if the cattle are forced to use them.

The amount of pressure you should use when spraying will vary according to the type of insect you are trying to control. The sprayer should be capable of developing at least 200 PSI. A squeeze pen is required to confine cattle for proper coverage and effective use of insecticide. Sufficient length of hose is needed to allow the operator to move freely and to ensure good coverage.

Another method used is the fogger. It generates a fine mist that drifts down onto the cattle. Many producers use this equipment to apply insecticide on cattle in pastures. A slight breeze is desirable to drift the insecticide-bearing mist onto the cattle.

The backrubber and dust bags are popular insect control devices. Locate them in areas that cattle frequent, such as gateways, shade areas, near water tanks or mineral feeders. Take care not to place them in such a way that they might contaminate the water, minerals or other feeds being fed. Check them frequently to ensure they are working.

Horn flies are easily controlled by dusting, spraying or by using back rubbers treated with an approved insecticide.

Ticks are difficult to control. Frequent spraying or dipping may be necessary.

A current list of approved insecticides is available at University Extension centers.

Grubs or warbles are another insect problem. Flies deposit eggs on the heels of livestock during the summer. Grub larva migrate through the body where they eventually get to the back and emerge through the skin soon after the first of the year.

Drugs for killing grubs are available as injectable systemics or pour-ons. They should be applied in the fall according to the label directions to kill the grub larva as they migrate through the body tissue. Timing grub treatment is important because if larva are killed when they are near the spinal cord or the esophagus (gullet), there may be reactions resulting in bloat or uncoordination of the hind limbs.
Use caution when applying any insecticide. Read the label carefully and observe all precautions. Deaths have occurred on several farms due to careless insecticide use.

Most cattle are affected by internal parasites. The condition is usually subclinical, that is, signs of the disease are not readily noticeable. The parasites can cause reduced feed efficiency and poor weight gains.

**Stomach and intestinal worms** can alter the lining of the true stomach (abomasum). This reduces the animal's ability to digest food. These worms lay eggs that the adult cattle shed in the manure. The eggs hatch and begin to develop into adult worms. During development, the larvae move up to moisture droplets on the forage foliage. Cattle grazing the forage then consume the larvae.

Once in the digestive tract of the animal, the worms continue to develop. They spend some time in the digestive juice glands of the stomach, where they inhibit the production of digestive juices.

Intestinal parasites can be controlled with chemical treatments and with proper pasture management. Larvae overwinter in manure or in soil under the manure and emerge the next spring. Young cattle are most susceptible to the effects of internal parasites. Adult cattle develop some immunity to the worms and are affected less. Therefore, control and treatment should be directed toward young, growing livestock.

Intestinal worms can be detected by examining stool samples. However, worm eggs can be absent and the cattle still may be wormy. Controlling these worms in cattle involves administering a dewormer at strategic times. Treat cows in the spring as they are turned onto new spring pasture. This reduces the worm load inside the cows so the cows cause less pasture contamination. The pasture also will have the lowest amount of worm eggs on it after the winter.

Calves should be given the dewormer about two to three months after they are on the pasture. This is the time the number of parasites on the lush pasture is starting to increase. Calves should be dewormed again in the fall. Replacement females and bulls should be given the dewormer at the same times as the cows and calves.

**Coccidia** are small internal parasites that cause fluid and blood loss from the intestines. Dark or bright blood in the manure may be present. The parasites multiply where sanitation conditions are not good and where rain accumulates. Cattle coccidia occur only in cattle. Cattle cannot contract coccidiosis from poultry or other livestock. Stressed animals are more susceptible to the parasite. Treatment is generally, although not always, effective. You can prevent damage from these parasites by reducing stagnant water pools and maintaining good sanitary conditions around feeders, troughs and watering devices. Coccidiostats can be added to the feed and are effective.

No single recommendation applies to all herds of cattle. The number of cattle, area of the state and type of management need to be taken into consideration when developing a worm control program.

Discuss your program with your veterinarian or extension personnel to evaluate the economic aspects of internal parasite control, particularly in mature cows.
Toxicosis

Materials commonly used in crop or livestock production and in machinery maintenance can be toxic (poisonous) to cattle if they eat or drink them. Label and store these products carefully.

Automobile antifreeze, or ethylene glycol, causes kidney damage if animals consume it. Antifreeze tastes sweet, and livestock lick or drink it readily. Machinery left in the field with leaky radiators may provide enough of the toxic material in a few hours or days to kill a cow. Treatment is usually ineffective because kidney damage is irreversible.

Discarded wet-cell batteries, which contain lead, are chewed or licked by livestock. This is often sufficient to cause severe illness or death. Lead affects the central nervous system. Cattle may grind their teeth and will often be blind. Treatment is usually ineffective. Lead may also be obtained if animals lick or chew on lead-based painted buildings or if they consume used oil from an engine that burned leaded gasoline. To prevent lead poisoning, properly store and discard toxic batteries, used oil and old paint in cans.

Monensin is a feed additive for cattle that may be used to improve weight gain and/or feed efficiency. It also has some coccidiostatic properties. Monensin can adversely affect the heart muscles, causing weakness and death if cattle consume too much. This can occur if feed is mixed improperly or if the mix contains too much monensin. Cattle with drought-caused hunger or feed withdrawal are especially susceptible because they will eat larger quantities of the mixed feed. There is no effective treatment. Proper mixing and storage will prevent monensin problems. Monensin also is highly toxic to horses.

Nitrate poisoning, due to cattle eating ammonium nitrate fertilizer, can cause severe illness and death. Cattle will get into unopened fertilizer bags if they are accessible. Cattle can also be poisoned if a leaky fertilizer spreader is left in the pasture. Treatment may be effective if it is given early and if the animal has not ingested too much material. Prevent accidents by properly storing and using fertilizer and applicators.

Urea used as feed or as fertilizer can also cause severe illness and death in cattle. Precautions are similar to those for nitrates.

Responsible drug and medication use

Every beef cow/calf producer has only one product: beef. Because this product is consumed, it is imperative that it be wholesome. We must remember that we are in the food business, not just the animal business. Livestock medications persist in the animal's body for differing lengths of time. Some medications given to a month-old calf can be present in detectable amounts when the animal is slaughtered. Some consumers have hypersensitivity to minute amounts of medications such as penicillin. Responsible use of all medications in livestock production is essential. Special consideration should be given to the following items.

Intended use

Medications should be administered only to control or treat the disease for which they are intended as denoted by the label directions. Different antibiotics are effective for specific bacteria.

Dosage

Label directions should be followed regarding dosage of the product. Product effectiveness was determined by using the dosage recommend-
ed. Increasing or reducing the dose may result in poisoning the animal, an extended withdrawal time or inadequate response and increased resistance to the antibiotic.

Observe label directions for withdrawal times. Meat containing a drug or its metabolites is adulterated and can cause an adverse reaction or illness in the person consuming it. Withdrawal times are listed on the label.

Administer medications and vaccines according to the label directions. Studies indicate that carcass defects occur more often when intramuscular injections are made. These defects must be trimmed at the packing house. Trimming in the hip and loin area results in reducing the premium-priced meat cuts.

When giving an intramuscular treatment, the neck area is the preferred injection site because it is a lower-priced cut of meat. Intramuscular treatments may be injected straight into the neck muscle in the mid-neck area. Subcutaneous (under the skin) injections should be made with a short, one-half-inch needle. Pinch or “tent” the skin and inject the material in the skin area. If directions allow either muscular or subcutaneous injection, choose the subcutaneous approach.

Use the smallest diameter needle that is possible to use. However, a needle that is too small may break. A 16-gauge, one and one-half-inch needle is adequate for intramuscular injection in cows. A 16- or 18-gauge, one-inch needle is sufficient for intramuscular injections in calves. Subcutaneous injections may be made with a 16- or 18-gauge, one-half-inch needle.

Keep needles and syringes clean. Sterilize them in boiling water if possible. The use of disinfectants in syringes and needles may render the medication or vaccine inactive, especially if it is a modified live vaccine. Injecting several animals with the same needle can spread diseases such as anaplasmosis and bovine leukosis (a type of cancer in cattle).

The injection site should be clean. Part the hair if necessary and place the needle into the skin. Injection into wet skin and hair or into a site covered with manure or dirt may cause infection and abscesses. This results not only in less response to the drug or vaccine, but also requires trimming of the carcass at the packing house.

**Prescription drugs** are medications that contain strict, technical label directions, which are not prepared for interpretation by the general public. Harmful effects may occur if the drugs are improperly administered or when there is a need for expert diagnosis. These drugs are labeled “For use by or on the order of a licensed veterinarian.” For example, just a small amount of prostaglandin, used for estrous synchronization in cows, can cause severe respiratory reactions in asthmatic persons or abortion in pregnant women.

**Over-the-counter drugs** are drugs for which adequate label directions can be prepared.
Extra-label use occurs when a product is used in a dosage not indicated on the label or for a condition for which the label does not specify. There is no law that specifically permits extra-label use. The Food and Drug Administration (FDA) recognizes that conditions exist in livestock production requiring use of drugs in an extra-label manner. However, the FDA restricts extra-label use to veterinarians and permits it if the following conditions are met:

1. A careful medical diagnosis is made by an attending veterinarian within the context of a valid veterinarian client/patient relationship.
2. A determination is made that (a) there is no marketed drug specifically labeled to treat the condition diagnosed, or (b) drug therapy at the dosage recommended by the labeling has been found clinically ineffective in the animals to be treated.
3. Procedures are instituted to ensure that the identity of the treated animals is carefully maintained.
4) A significantly extended time period is assigned for drug withdrawal prior to marketing meat, milk or eggs; steps are taken to assure that the assigned time frames are met, and no illegal residues occur.

The National Cattlemen’s Association and the Missouri Cattlemen’s Association have developed a quality assurance beef production program for producers and feeders. These programs focus on ensuring carcass quality and avoiding drug residues.

To the packer, carcass defects result in less return due to excess trimming. This can mean a substantial penalty to the offending feedlot. Because some of these defects (injection-site damage and carcass blemishes) may have occurred before the animal arrived at the feedlot, the cow/calf producer may be targeted as a contributing source of the problem. As packers and feeders improve their ability to trace the origin of a specific problem, they will increasingly shift the loss to that source. Therefore, a cow/calf producer who sells calves with carcass blemishes or injection-site damage may face either a penalty from the feedlot or packer or will not be allowed to supply cattle to that feedlot or packer.

It is imperative that producers work with their local veterinarian to ensure compliance with recommendations.

Records

Records kept on each cow and calf are essential for herd health maintenance. Annual calving, breeding, progeny and vaccination records will allow you to make production decisions based on your herd data. Using someone else's data or using averages when making these decisions will not optimize production for your unit. MU publication MP625, Individual Beef Cow Record, is a card-type sheet for recording such information. Copies are available from county extension offices or from Extension Publications. See the back cover of this manual for ordering details.
Records on each cow and calf are essential for a sound herd health management program and profitable enterprise.

The following is a list of procedures and vaccinations to consider for proper health maintenance in a cow/calf herd. Not all recommendations will be appropriate for every herd. Consult your local veterinarian.

1. Identify calf with ear tag.
2. Treat orally for viral scours before the calf receives colostrum if a rota- or coronavirus is suspected to cause scours in calves. The vaccine is made specifically to protect calves from scours caused by these two viruses. Do not use if the cows receive the viral scour vaccine before calving.
3. Castrate non-replacement bull calves. They will, when implanted with a growth stimulant, perform similarly to bull calves. The post-castration recovery period is much shorter and gain is affected less when done at this young age.
4. Implant non-replacement heifers with a growth stimulant.

One month to weaning

1. Vaccinate against clostridial muscle disease group, blackleg, malignant edema and sordelli. This is a multivalent bacterin, “4-way” bacterin or “7-way” bacterin.
2. Vaccinate against leptospirosis.
3. Deworm in June or July after going onto pasture in April or May with the cows.
4. Re-implant according to implant growth stimulant label directions.
5. Dehorn as young as possible. Post-dehorning complications are less and weight gain resumes sooner if done at a young age.
6. At six months of age or at weaning, vaccinate against IBR and PI3. Vaccinate against BVD and BRSV if it is advised by the local veterinarian.
7. Vaccinating for pinkeye may be beneficial in some herds.
8. Administer grub control in the fall.
9. Use coccidia control if creep fed.
Replacements

1. Revaccinate against clostridial muscle disease group, blackleg, malignant edema and sordelli.
2. Vaccinate against leptospirosis.
3. Vaccinate or revaccinate against IBR and BVD if used in the cow herd. Use at least four weeks before breeding unless using inactivated vaccine. Don’t use modified-live IBR vaccines on pregnant animals because abortion may occur.
4. Deworm cows or calves at spring, summer and fall.
5. Administer grub control in the fall.
6. Vaccinate for vibriosis if deemed necessary for cow herd. Virgin heifers are most susceptible.

Breeding cows

1. Vaccinate against leptospirosis annually or, in some cases, twice annually with vaccine containing 3 to 5 strains. Cows can be vaccinated against leptospirosis whether open or pregnant. Consult your veterinarian on frequency and number of strains to use in a vaccine.
2. Vaccinate against IBR and BVD. This need not be done yearly unless IBR and BVD cause herd reproductive problems or inactivated vaccines are used. Follow the same precautions as for replacements.
4. Deworm in spring before placing herd in new spring pasture.
5. Apply grub and lice control in fall.
6. Perform a physical examination after breeding season.
7. Vaccinate for vibriosis before breeding.
8. Vaccinate against calf scours before calving with coliform and viral scours bacterins and vaccines.

Bulls

1. Apply grub and lice control in fall.
2. Deworm in spring and fall.
3. Conduct a breeding soundness examination two months before breeding season.
4. Vaccinate against anaplasmosis.
5. Administer IBR and BVD vaccines.
6. Administer a multivalent leptospirosis vaccine.
7. Vaccinate against vibriosis.
✓ Do you have?

- Cattle leader or nose tongs
- One-half inch rope halter
- Lariat with quick-release honda
- Scalpel and blades for castrating
- Veterinary thermometer
- Plastic gloves with long sleeves
- Obstetrical chains and handles
- Dehorner
- Artery forceps
- Liquid soap
- Disinfectant for instruments
- At least 2 plastic or stainless steel buckets
- Obstetrical lubricant
- Esophageal feeder
Herd Health Maintenance

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For information on how to order additional publications in the Beef Cow/Calf series, see MU publication M147, University Extension and Your Cow/Calf Operation, or check with your local extension center.

On the cover: The rough coats on these calves are signs they have been grazing on endophyte infected fescue pasture. Several steps can be taken to overcome the endophyte impact on herd health.