



MOOSE JAW ANIMAL CLINIC

1885 CARIBOU ST. W, MOOSE JAW, SK S6H 4P5
(306) 692-3622 FAX (306) 693-2798

DR. ALAN GILBERT
DR. RAM CHANGAR

DR. CARLA HICKS
DR. LISA CUNNINGHAM

DR. MELANIE BLAGER
DR. MAGGIE PETZ

DISEASES YOU ARE VACCINATING AGAINST

1. BVD (Bovine Viral Diarrhea) - Virus

BVD causes a wide variety of clinical disease syndromes in cattle including infertility, abortion and congenital defects in calves. A syndrome known as mucosal disease, which is also caused by the BVD virus can produce high mortality in calves and yearling cattle. Outbreaks of BVD infection can have devastating economic consequences to the cattle producers. BVD is widespread in western Canada - a study in Saskatchewan and Alberta in 1990 found that 2/3 of all farms had cattle that had been exposed to BVD. BVD is spread by direct contact between animals. Infected animals shed the virus from discharges from the mouth, nose, eyes, or in the milk. Manure from infected animals with diarrhea have high virus concentration and infected bulls can shed the virus in their semen. The BVD virus can also cross the placenta and this allows for transmission to the unborn calf. In western Canada, infection of the non-immune pregnant cow with subsequent infection of the embryo or fetus, is responsible for most of the economic losses caused by the BVD virus. The stage of pregnancy at which the unvaccinated cow is exposed to this virus produces a number of different manifestations:

- Early pregnancy (< 40 days)
 - Early embryonic death and infertility
 - Will notice a lot of late bred cows or early abortions
- Early gestation (40 to 120 days)
 - Development of persistently infected (PI) calves
 - At this stage, the calf's immune system is developing, and the calf thinks the virus is a normal part of its body which allows the calf to become a permanent source of infection.
 - PI calves generally die of mucosal disease between 6 and 18 months of age, but not before exposing all the other animals around it, including other pregnant cows. The spread of disease is continued.
- Mid gestation (120 to 180 days)
 - Can result in calves born with birth defects of the part of the brain that controls balance and coordination
 - These calves generally have difficulty walking and may also have deformed legs, cataracts, and blindness
- Late gestation (after 180 days)
 - Fetus will have a functional immune system, be able to produce antibodies to BVD virus, and will be born immune to the virus.
 - These calves will be normal and not carry the virus

Normal animals can also become infected with BVD virus. Mild episodes of diarrhea and a mild fever would ensue, the animal's immune system will clear the disease and the animal does not remain a carrier and will be immune to that virus. In recent years a new "acute" strain of BVD infection has appeared that seems able to produce a variety of diseases in immune-competent animals. It seems to infect normal calves or adults after birth and can cause a

severe form of the disease that is virtually identical to acute mucosal disease. This strain of BVD seems to occur more in Quebec/Ontario. Some other strains of BVD can cause a “bleeding syndrome” to occur, and these animals bleed profusely from injection sites and may bleed into their eyes, appearing blind. This syndrome has been reported in feedlot cattle in western Canada.

There is no treatment for BVD, therefore prevention by vaccination is crucial.

1. IBR (Infectious Bovine Rhinotracheitis) - Virus

The IBR virus can persist in a clinically recovered animal for years. These animals are “carrier” animals and can shed the virus during periods of stress. IBR causes a variety of clinical disease forms:

- Respiratory form - disease is usually confined to the upper respiratory tract (nose, throat and windpipe). Signs include difficult inhalation, rapid breathing, profuse watery nasal discharge that, as the infection progresses, becomes a sticky yellow discharge that hangs in long strands from the nose. The animal often stands with the head and neck extended, exhibits mental depression and decreased appetite, and has a fever. Most animals develop crusts on their nose that look very red and inflamed when rubbed off, leading to the term “red nose” that is often referred to when discussing IBR. Respiratory IBR usually appears when groups of animals are confined (ie feedlots) and appears about 1 week after infection, persisting for up to 14 days in susceptible animals.
- Ocular or eye form - may occur with the respiratory form of the disease or by itself. Severe inflammation of the lining of the eyelids and the whites of the eyes occurs. The infection usually occurs in both eyes. Sometimes a white spot appears on the eye - this is usually due to a secondary infection. Remember: IBR starts on the whites of the eyes, while pinkeye tends to start at the center.
- Abortions - can occur in cattle that are exposed to IBR virus from one of two sources:
 - The first source is from exposure to the respiratory form of IBR, that replicates and enters the cow’s bloodstream. The virus migrates to the pregnant uterus and invades the fetus. In the fetus, multiplication of the virus continues and fetal death may occur, especially at 4 to 6 months of gestation. The fetus dies after 3 to 4 days of infection and abortion of a rotten fetus occurs 2 to 7 days later. The whole process from initial infection of the cow to abortion may be as short as 18 days or as long as 3 months, hence abortion occurs during the 6 to 9th month of pregnancy
 - The second source of IBR virus abortion is vaccination of non-protected pregnant cows or of calves nursing non-protected pregnant cows with MLV (Modified live virus) IBR vaccines.
- Genital form of IBR - primarily this is a problem in sexually mature males and females. In the cow, this often manifests as a thick white to brownish coloured vulvar discharge that clings to the vulvar tuft of hair. The vulva is often swollen, and the lining of the vagina is red with little white pimples. This is called Infectious Pustular Vulvovaginitis (IPV). The cow often holds her tail up and urinates frequently. Sometimes these pustules may be seen on the bull’s penis or prepuce as a result of mating with an IPV infected cow. In either case both the male and female lose the desire to mate. The infection usually lasts 2 to 3 weeks and abortions/respiratory disease is rarely present.
- Brain infections - occurs in young beef calves. The calf refuses to eat and exhibits generalized tremors with periods of excitement characterized by uncoordinated movements, running, circling and stumbling. These symptoms are usually followed by

- mental depression, physical collapse, coma, and death.
- Newborn calf infections - this condition is usually seen in herds experiencing IBR abortion problems. The calf, instead of being aborted, is born infected with IBR and has a high fever, loss of appetite, mental depression and respiratory distress. The disease is generally fatal.

2. Bovine Respiratory Syncytial Virus (BRSV) - Virus

Cattle most susceptible are beef calves 6 weeks to 13 months of age. The disease tends to be acute with nasal and ocular (eye) discharge, fever, cough, progressive dyspnea (trouble breathing) and occasionally subcutaneous emphysema (air under the skin). This virus is usually part of the “shipping fever” pattern of pneumonia, and the initial viral infection is complicated by secondary bacterial infections causing severe pneumonia. Calves infected with BRSV often have a very hard time breathing, and are often found with their tongues hanging out. Outbreaks of BRSV infection generally follow stressful weather changes.

3. Parainfluenza 3 - (PI3) - Virus

Affected cattle exhibit watery to yellow coloured discharges from the eyes and nose, coughs, increased respiration rates, and fever. By itself PI# is a relatively mild infection; death due to the disease is rare to non-existent. However, it generally works in concert with IBR, BRSV, BVD, Pasteurella and Haemophilus infections, making the mixed infections more damaging and dangerous. This is why this vaccine is in combination with the other diseases mentioned above.

4. Haemophilus/Histophilus somnus (H. somnus) - Bacteria

H. somnus spreads through cattle herds in a very elusive manner, and usually becomes a major problem before the disease has been detected. Historically, H. somnus has been considered to be a disease of the nervous system, causing “ITEME”. Now, it is recognized that the organism can affect many organs in the body - reproductive, urinary, respiratory. H. somnus can affect both the upper and lower respiratory tract - it is involved in calf diphtheria, which is a severe throat infection that causes loud breathing and slobbering. If H. somnus reaches the lungs, it can also cause a severe pneumonia. Sometimes the pneumonia is so severe that it can kill the calf before clinical signs are detected. Quite often the pneumonia starts with H. somnus and becomes overgrown by opportunistic bacteria like Pasteurella. In either case, the pneumonia must be treated quickly or death may occur. H. somnus can also commonly cause septicemia (blood infection), the clinical signs of which depends on what part of the body is affected. H. somnus causes blood clots to form in the blood vessels, and the lack of blood flow causes tissue in various parts of the body to die off.

- If the blockage occurs in the brain/spinal cord, it causes the classic disease “ITEME”. Affected animals have an altered gait, walk in circles, knuckle over at the fetlocks, and eventually start to “head press”, appear blind, and have convulsions. The affected animals become comatose, and are often referred to as “sleeper calves”. Unless treated at an early stage, these calves will die.
- If the H. somnus blockage happens to the blood vessels of the heart, a heart attack may occur. In fact, many cases of septicemia result in death due to heart muscle damage.
- If the blockage occurs in blood vessels to and in the skeletal muscles, stiffness and lameness occur. Sometimes opportunistic organisms like Blackleg can move into the damaged muscle and cause other diseases.

Because this is a bacterial infection, treatment includes antibiotics like Excenel, Micotil, Nuflor, Draxxin, and the tetracycline, penicillin, or sulfa drug families. Most of these antibiotics just halt the progression of this disease - it is the body that actually kills it. Therefore, early treatment and prevention (by vaccination) are the most important things to do to prevent losses due to this disease.

5. Mannheimia (Pasteurella) haemolytica - Bacteria

Pasteurella is a bacteria that plays a major role in the Bovine Respiratory Disease (BRD) Complex, also known as "Shipping Fever". BRD refers to the various manifestations of pneumonia and other respiratory diseases that occurs in cattle that are trucked and co-mingled, often on the way from the farm through the auction mart and on the way to the feedlot. As such, stress plays a MAJOR role in the development of this disease (stress due to weaning, trucking, weather) as it lowers the animal's immune system function thereby making them susceptible to infection with a great number of respiratory viruses and bacteria. The disease usually appears 7 to 10 days after entering the feedlot. The combination of stress/lowered immune system effectiveness and respiratory viral infections (mentioned above) brought about by co-mingling of many different groups of cattle from many different areas make the lung susceptible to infection with numerous respiratory bacterial pathogens. Pasteurella haemolytica is the most important agent, although Pasteurella multocida and Haemophilus somnus also play a role. These bacteria (which are normally confined to the upper respiratory tract) move down into the lungs past the weakened immune system, and infiltrate the lung lobes, causing a severe pneumonia. Vaccinating against Pasteurella can help reduce the severity of shipping fever pneumonia.

6. Clostridial Diseases - Bacteria

Clostridium is a family of bacteria that can cause a variety of diseases. The vaccines commonly vaccinated for include:

- **Clostridium chavoei - BLACKLEG**
 - Causes high fever and rapid death.
 - Usually affects the best calves in the herd
 - Usually affects calves between 6 and 24 months of age
 - Signs include acute lameness, marked depression, and swellings on the body
 - Usually not associated with a wound
- **Clostridium novyi Type B - BLACK DISEASE** or infectious necrotic hepatitis
 - Sudden death
 - Usually associated with some initial insult to the liver (ie liver flukes)
- **Clostridium perfringens Type C - HEMORRHAGIC ENTEROTOXEMIA**
 - Causes acute diarrhea and dysentery in calves (usually up to 1 month of age) otherwise known as one of the causes of scours in newborn calves
- **Clostridium perfringens Type D - PULPY KIDNEY**
 - "Overeating Disease" caused by Clostridial overgrowth due to excessive carbohydrate ingestion
 - Rare in calves, but they often show neurological signs, or are just found dead
- **Clostridium septicum - MALIGNANT EDEMA**
 - Similar disease to blackleg except this is usually associated with some kind of wound (ie castration or puncture wound)

- **Clostridium tetani - TETANUS**
 - 10 to 14 day incubation. Usually results from infection of deep wound or castration site. First see localized stiffness, progresses to animal being down, tail sticking straight out, stiff legs, muscle spasms, and a “sawhorse” stance
- **Clostridium hemolyticum (Type D) - BACILLARY HEMOGLOBINURIA**
 - Often causes sudden death due to the rapid breakdown of red blood cells
 - May see blood in urine, brisket edema, abdominal pain, trouble breathing, depression

In order for Clostridial organisms to grow, they need an environment without air (oxygen). These diseases are very effectively controlled with vaccination, and can be treated with antibiotics (penicillins) if the disease allows enough time for the medication to start to work.

7. Bovine Rotavirus - Virus

Rotavirus is one the most common of the four main causes of diarrhea in neonatal calves. Most calves are between 4 and 14 days of age when they develop this disease.

- Calves develop profuse watery diarrhea and become dehydrated quickly
- Usually not in very young calves because they are protected by cow’s colostral antibodies
- Disease affects the small intestine and is usually self limiting and short lived, but takes time for damage to repair that has occurred

Rotavirus can be prevented by remembering biosecurity issues, making sure every calf receives colostrum within the first 6 hours of birth, cleaning the calving areas each year, preventing over-crowding in calving areas, and moving calves to pasture ASAP. Vaccines are also readily available for both the cow (before calving) or the newborn calf to prevent outbreaks of several serotypes of rotavirus in neonatal calves.

8. Bovine Coronavirus - Virus

Coronavirus is another of the four main causes of diarrhea in neonatal calves. It usually causes disease between 4 and 30 days of age

- Calves are more likely to exhibit symptoms of colitis (straining to defecate, mucous and/or blood in stool) as well as the profuse diarrhea that causes dehydration
- Disease affects both the large and small intestine

Coronavirus can be prevented by remembering biosecurity issues, making sure every calf receives colostrum within the first 6 hours of birth, cleaning the calving areas each year, preventing over-crowding in calving areas, and moving calves to pasture ASAP. Vaccines are also readily available for both the cow (before calving) or the newborn calf to prevent outbreaks of coronavirus in neonatal calves.

9. Escherichia coli (E. coli) - Bacteria

E. coli is one of the four main causes of diarrhea in neonatal calves. It usually infects calves that are less than 5 days of age.

- Weakness may develop before diarrhea appears
- Profuse, watery diarrhea causes dehydration and death very quickly in calves this young and septicemia (blood infection) can lead to swollen, septic joints

- Disease affects the small intestines but can also be a cause of navel ill (infected umbilical cords)

E. coli can be prevented by remembering biosecurity issues, making sure every calf receives colostrum within the first 6 hours of birth, cleaning the calving areas each year, preventing over-crowding in calving areas, and moving calves to pasture ASAP. This is a bacteria, so it can respond to antibiotic treatment as long as the calf's dehydration is also addressed. Various strains of E. coli are included in the scour prevention vaccines both for the cow and for the newborn calf.

10. Vibriosis (Campylobacter fetus) - Bacteria

Vibrio is a sexually transmitted bacterial disease that can cause both abortions (between 5 and 6 months of gestation) and problems with infertility and longer intervals between estrus in cattle herds. Although the abortion rate in a herd is thought to be relatively low compared with other known causes of abortion, a loss of 5 to 20% of pregnancies mid-gestation on top of the poor pregnancy rates can be economically devastating to the producer. This is considered to be the most important cause of infertility in cattle and spreads quickly through naïve herd. While the cattle do recover within the year, carriers are common and can cause a repeat of the infection in following years. This disease is best controlled by vaccination, but can also be controlled by the use of A.I. instead of a pasture bull.

11. Leptospirosis (*L. hardjo*, *L. icterohaemorrhagiae*, *L. canicola*, *L. pomona*, and *L. grippotyphosa*) - Bacteria

Infection with *Leptospira* bacteria initially causes a high fever that can cause abortion quickly (within 2 to 5 weeks), or result in abortion in late gestation (more than 6 months) without any symptoms at all. The first sign of leptospirosis in a herd is often multiple abortions. This bacteria can also cause disease in adult cattle, making mucous membranes turn yellow and the urine bloody. It can also be a cause of mastitis. Infection causing clinical disease is rare in adult cattle. Abortions of 25 to 30% of the herd are the most common form of this disease. At this time vaccines are available for the 5 most common *Leptospira* species (listed above) that cause abortion in cattle in North America.