



# River Valley Veterinary Clinic

## March 2017 Newsletter

### Hardware Disease

As we know, cows can be both extremely picky eaters and undiscerning at the same time: they'll spend a long time trying to sort through TMR to find the best bits to eat, but end up eating a nail or piece of wire, too, and risk hardware disease. Metal pieces in feed generally come from a field during harvest that has old fencing or baling wire or from pastures with recent construction nearby. Hopefully, most of the metal pieces are removed by magnets on conveyors or in the mixer, but they sometimes slip past. The pieces of metal cows eat that cause trouble are 2-5.5 inches long. Shorter pieces pass through while cows have difficulty eating the longer ones. Since cows don't fully chew their food before swallowing, the metal is swallowed without damaging their mouth.

Once swallowed, the metal sinks to the bottom of the rumen and passes into the reticulum with the help of ruminal contractions. The honeycomb pattern of the lining of the reticulum traps the larger metal pieces, preventing them from following the flow of feed into the next stomach and onward. It is fairly common for cows to have metal in their reticulum: about 65% of cattle slaughtered in the Eastern US have some form of metal in their stomachs.

Fortunately for most cows, the metal doesn't cause hardware disease. For the unlucky few, however stomach contractions will push sharp pieces of metal up against the stomach wall and punch through. The chances of getting hardware disease are higher in late pregnant cows when the uterus takes up a lot of space in the abdomen, shifts the intestines and stomachs forward and compresses them. With less space available for the piece of metal, it is more likely to puncture through the stomach wall. In addition, when a cow is in labor, the abdominal contractions required to push the calf out also increase the pressure on the metal against the stomach wall.

Feed and microbes in the stomach leak through the hole created by the metal and into the abdominal cavity and cause peritonitis, which means an infection ("-itis") of the abdominal cavity ("periton-"). Usually the cow's immune system is able to wall off the infection with adhesions and fibrin to keep it from spreading throughout the abdomen. An abscess will often form within the fibrin capsule and the adhesions will 'glue' the stomachs to the diaphragm and body wall, making normal stomach contractions difficult. Occasionally the body can't wall off the peritonitis and it spreads throughout the abdominal cavity resulting in massive infection, tons of adhesions and a rapid decline in the cow.

Unfortunately for the cow, the reticulum lies directly behind and is in contact with the diaphragm, which is directly behind the pericardial sac encasing the heart. This means a piece of metal can easily continue its migratory path and move through the diaphragm, spreading the infection to the chest cavity (called pleuritis: 'pleura' = chest cavity; '-itis' = infection) and possibly into the heart (called pericarditis: 'pericardia' = area around the heart). The scientific name for hardware disease basically describes where the metal went: traumatic peritonitis, pleuritis, pericarditis or all three! No matter where the metal goes, it spreads infection and causes abscesses.

With the initial puncture through the reticulum, the cow has a sharp drop in milk production and the stomachs stop moving normally. It is quite painful to breathe, move or do anything, so the cow will be taking short and fast breaths, arch her back and be anxious but reluctant to move. If she has to move, she'll go slowly and tenderly and grunt in pain with any sudden movements like standing or lying down. Along with arching her back, she may stand with her elbows held away from her body in an attempt to relieve the pressure and pain. When your vet suspects hardware disease, they may pinch along the cow's topline as a test: a healthy cow will arch her back toward the floor and away from the pinch whereas a cow with hardware will not move or may even arch her back into the pinch, as it is less painful. If the infection damages the nerves that go to her rumen, the cow will have difficulty burping and bloat. Over the next few days, the symptoms of chest pain become less apparent as the initial inflammation goes down and the body begins to wall off the infection, but the cow remains down in feed intake and milk production.

Infections in the heart or chest space are understandably more severe, interfering with lung and heart function. The cow's breathing becomes even faster and shallower, and she develops a fever. Pericarditis (the infection around the heart) creates a characteristic heart murmur sounding like a washing machine, and she develops congestive heart failure with fluid collecting under her jaw (bottle jaw) and brisket. In really severe cases, her pulse might even be visible in her jugular vein along her neck. All signs of heart failure have a poor prognosis. The piece of metal can also simply cause a massive bleed-out and sudden death.

The treatment of hardware disease focuses on using antibiotics to control the infection, but can't stop the formation of adhesions. Broad-spectrum antibiotics like penicillin, the ceftiofurs or oxytetracycline work well to attack the large variety of bacteria coming from the stomach. The other important part of

treatment is giving the cow a magnet if she doesn't have one already. An easy way to check is to hold a compass vertically right behind her left elbow. A magnet in her stomach will pull the compass needle toward it. If she already has one, giving her another won't double the ability to pick up metal, since the magnets tend to just stick to each other, but it is better than no magnet if you are unsure. The magnet naturally settles in the reticulum due to its weight, right where it needs to be. Giving a cow with hardware disease a magnet is mostly to prevent the disease from happening again, but it may retrieve the offending metal piece if most of it is still in the reticulum. The remainder of treatment involves some TLC: encourage the cow's appetite with probiotics or oral fluids with alfalfa-based drenches and keep her confined for about a week to a stall or bedded pack. Limiting her mobility will decrease the chances of the metal moving around even more until adhesions can form to hold it in place. Occasionally surgery is performed to open the rumen to search

for the metal if it is still in the reticulum, remove it and put in a magnet, sometimes opening up an abscess to drain into the stomach. It is a difficult surgery and not always successful, so it is often an impractical option.

To prevent hardware disease, all cows should be given magnets, usually around the time they first calve as heifers. The ringed bar magnets are best as the smooth bar magnets don't seem to be as strong. Eliminating metal from feed is also important: pass feed over magnets in the mixer or on a conveyer to remove pieces. Don't forget to check those magnets regularly; they don't work well covered in metal. The switch from baling wire to baling twine has brought a huge reduction in reducing the number of cows with hardware disease. But the twine can cause its own problems in the intestines, so make sure it doesn't end up in the cow's feed either. As with most diseases, preventing hardware disease is much easier than treatment and is always the best option.

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### **Sauk County Dairy Promoters Annual Meeting**

The Sauk County Dairy Promoters are having their annual meeting mid-March and are in need of two dairy farm members (husband, wife, son, daughter, herdsman, etc.) and one dairy industry person (veterinarian, nutritionist, dairy equipment dealer, breeder, etc.) who have fresh ideas, are interested in and are motivated to help positively promote and educate consumers about the dairy industry and its products throughout Sauk County. Board members serve a 3 year term and can serve two consecutive 3 year terms. Time requirements are minimal: they meet for a couple of hours once a month every 1-2 months and help with promotional events throughout the year. If you have any questions about the group, contact Dr. Lochner at (608) 279-6215 or send a message at our Facebook page, Sauk County Dairy Promoters, Inc.

New board members will be voted on at the annual meeting which is on March 14 at 7:45 at Coach House in Rock Springs. If you plan to attend, please RSVP by contacting Dr. Lochner or through the Facebook page. Come join the conversation and help promote the dairy industry!