Milk Fever (Hypocalcaemia) in Cows

Milk fever is a disorder mainly of dairy cows close to calving. It is a metabolic disease caused by a low blood calcium level (hypocalcaemia). Between 3% and 10% of cows in dairying districts are affected each year, with much higher percentages occurring on some properties. Jersey cows that are mature and fat and graze lush, clover dominant pasture before calving are most susceptible. Losses are due to deaths (about one in 20 affected cows dies), a reduction in the productive lifespan of each affected cow of about three years, and reduction in milk production following each milk fever episode, as well as costs of prevention and treatment.

In typical cases cows show some initial excitement or agitation and a tremor in muscles of the head and limbs. Then they stagger and go down to a "sitting" position, often with a 'kink' in her neck, and finally lie flat on their side before circulatory collapse, coma and death. A dry muzzle, staring eyes, cold legs and ears, constipation and drowsiness are seen after going down. The heart beat becomes weaker and faster. The body temperature falls below normal, especially in cold, wet, windy weather. These signs are due mainly to lowered blood calcium levels. Sometimes there are additional signs due to complicating factors. Bloat is common in cows unable to "sit up" because the gas in the rumen is unable to escape. Pneumonia and exposure may affect cows left out in bad weather.

About 80% of cases occur within one day of calving because milk and colostrum production drain calcium (and other substances) from the blood, and some cows are unable to replace the calcium quickly enough. High producers are more susceptible because the fall in their blood calcium level is greater. Selecting cows for high production may, therefore increase the problem with milk fever. Some individual cow families or breeds (for example, Jerseys) are more susceptible than others. Age is important. Heifers are rarely affected. Old cows increase in susceptibility up to the fifth or sixth calving because they produce more milk and are less able to replace blood calcium quickly. The feeding management of dry cows in the 2 weeks before calving is very important, because it affects both the amount of calcium available to replace blood calcium and the efficiency with which the available calcium can be used. When the amount of calcium in the diet is greater than is needed, the efficiency of absorbing calcium from the intestine and the efficiency of transferring calcium from the skeleton both become very sluggish and the chance of milk fever is greatly increased. Also, grazing pastures in winter and spring results in alkaline blood which creates conditions unfavorable for the availability of calcium in the body and predisposes the cow to milk fever. Feeding hay prior to calving and restricting access to green feed results in acidic blood which favors calcium mobilization from bone and improves calcium absorption from the intestines, both of which are important factors in preventing the occurrence of milk fever.
There are several places around town to gain great experience both with animals in general and with veterinary medicine. Here is a synopsis of a few places.

**Rocky Mountain Raptor Center**

This center is dedicating to rehabilitating injured raptors and spreading education about the importance of raptors. There are two ways to get experience here, volunteering and internship. Volunteering requires that you participate in one shift once a week and attend weekly rounds. There are several different types of shifts, which last about 3-4 hours. Rounds occurs every Tuesday from 6pm to 7pm. There are several different internship opportunities including rehabilitation and public outreach. These require more time but a great experience based on my opinion. There is an application process to become an intern. The center is located in town on East Vine about a 30-minute bike ride from campus. Buses also run near the center, so it is possible to get there without a vehicle. For more information, visit their website at http://www.rmrp.org/.

**CSU Vet Teaching Hospital**

Have the dream to get into CSU vet school? Who doesn’t? You can volunteer at the VTH even before becoming a vet student. The process is actually very simple. You get the application online and apply to the different areas that you would like to volunteer with. Depending on the department’s need for volun-
teers, they may approve your application. The minimum commitment is 15 hours a month and some departments may ask for more. Personally, I have had a great time volunteering with the Urgent Care department. I get to learn the different procedures that the hospital has and get acquainted with many of the doctors that work there. It is a great place to gain some knowledge and get some hands-on practicing with restraining animals. They are located in town and there are several buses that go to or near the hospital, so getting there is easy. To learn more visit their website at http://csu-cvmbs.colostate.edu/vth/Pages/default.aspx (type volunteer into the search bar for the best results).

**Fort Collins Cat Rescue**

Making Every Pet a Wanted Pet ...

There are two areas to volunteer at this center, the Spay and Neuter clinic and the shelter. Both of these areas can help you gain veterinarian hours and if you need non-vet hours, the shelter can provide these as well. The center is located at Mulberry and Timberline, so it is a little bit of a journey to get there but there is a bus that runs right near there, it is possible to volunteer there without a car. The requirements is 8 hours a month which ends up equating to one 2 hour shift a week and shifts run almost every day and almost anytime. You’re also required to attend one offsite event a year. There is an orientation so it is important to get started near a time when an orientation is going to occur. My personal experience has been great. I mainly worked at the spay and neuter clinic but I have learned many of the basic skills to providing medical care such as vaccinating, microchipping, post-surgery procedures and pre-surgery producers. There is a position in the shelter where you do intake of the new cats. The center also has a fostering system that also counts as animal experience. To find out more information visit their website at https://www.fccrsnc.org/.

Ever had a good experience somewhere that you would like to share with your fellow pre-vet students? If yes send an email rcrouse@rams.colostate.edu with a little synopsis (about 150 words) and the place’s website and your place could be features in the next issue (you also get .25 of a point of every submission!).
Don’t forget the last meeting of the semester will be held on April 15th, and will feature Dr. Boon.

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Fat cows are at a greater risk than thin cows. This is partly because their feed and calcium intake has been higher and partly because fat cows produce more milk at calving time. Some cows get milk fever several days or even weeks before or after calving. This is usually due to the feed, especially the dietary calcium, being insufficient to meet the heavy demand due to the rapidly growing fetus or milk production in early lactation. In early lactation, cows should receive as much calcium as possible, and clover-dominant pasture are therefore desirable. They will help to prevent grass tetany as well as milk fever.

Treatment should be given as soon as possible. Use 300 ml, or more, of a 40% solution of calcium borogluconate or, preferably, a combined mineral solution such as "three-in-one" or "four-in-one". Often 600ml may be required. The combined solutions contain additional ingredients such as magnesium, phosphorus and dextrose (for energy), which may also be at low levels in the blood while cows have milk fever. Packets of solution together with an injection kit are best kept on hand for emergencies. All equipment should be kept sterile to avoid abscess formation at the site of injection. Injection of the solution by farmers should be in several places under the skin on the neck or behind the shoulder, unless the cow is in a coma or there are other reasons for desiring a quick response. Injection into a vein should be left to a veterinarian as it can cause sudden death if not carried out properly. Veterinary assistance is also advisable if there is not a quick response to treatment, because other problems may also be present. Cows that are "flat out" should be propped up into a normal resting position to relieve bloat. If weather conditions are bad, or the response to treatment is slow, transfer the cows to shelter to prevent exposure and other complications. Provide feed and water. Rugging helps. Some cows that have been comatose may have regurgitated and inhaled rumen content into the lungs. If there is ruminal material around the nose one should be suspicious that this may have happened and intensive antibiotic treatment should be commenced as soon as possible as inhalation pneumonia is often fatal. Recovered cows should not be milked for 24 hours; then the amount of milk taken should be gradually increased over the next 2-3 days.

Management of the diet can be a valuable aid preventing milk fever. Cows should be kept on a low calcium diet while they are lactating (dry). This stimulates their calcium regulatory system to keep the blood levels normal by mobilizing the body stores of calcium from the bone. When the demand for calcium increases as calving, calcium can be mobilized much more rapidly from bone than the feed, therefore preventing milk fever. With cows at greater risk - Jersey cows of mature age and in forward to fat condition - green feed should be restricted and plenty of hay fed for at least 1-2 weeks before calving. Neither should contain a high percentage of clover or capeweed. If it is necessary to improve the body condition of cows in order to improve milking performance, feeds high in energy but low in calcium may be used, for example cereal grain or oaten hay. Cereal grain is also high in phosphorus content, and this is of additional value. Cows close to calving should be kept in a handy paddock to enable frequent observation and early detection of milk fever. On the point of calving, and afterwards, the available feed and calcium should be unrestricted. Calcium feed supplements may be helpful at this point, but should not be given earlier. Where dietary management is inadequate, other methods are sometimes used. Vitamin D3 given by injection 2-8 days before calving may be useful. As the calving date is often difficult to predict, repeated treatments are sometimes necessary. A common treatment used to prevent milk fever is the injection of calcium borogluconate just before or just after calving. Some cows are given more than one treatment. This is quite successful because the calcium provides a reservoir to increase blood calcium just at the time it is needed for milk andcolostrum. The danger is that it may not last long enough and milk fever may still occur before the calcium-regulating mechanism of the cow is working efficiently. Drenching cows with Unimix on the day before and then twice daily for 1 to 2 days after calving has considerably reduced the incidence of milk fever in some herds where other methods alone have been unsatisfactory. Unimix is a registered product containing a mixture of calcium and magnesium. Cows that have required injections to treat milk fever will benefit from a drench of Unimix to help prevent relapses.

Veterinary Medicine Quiz

1. Which of the following is the most common cause of maxillary sinusitis in the horse?
   (A) Bacterial lower respiratory tract disease extending into the sinus
   (B) Infection and abscessation of a tooth root extending into the sinus
   (C) Inhaled foreign bodies lodging in the sinus
   (D) Puncture wounds extending into the maxillary sinus
   (C) Rotavirus infection
   (D) Transmissible gastroenteritis
   (E) Vomiting and wasting disease

2. Which of the following abnormal cardiac rhythms is most frequently seen in dogs with gastric dilatation-volvulus?
   (A) Atrial premature complexes
   (B) Junctional escape beats
   (C) Second-degree atrioventricular block
   (D) Sinus bradycardia
   (E) Ventricular premature complexes

3. A goat has a sudden onset of clinical signs of blindness, depression, head pressing, and anorexia that progress to recumbency with opisthotonos and nystagmus. Which of the following is the most likely diagnosis?
   (A) Bacterial meningitis
   (B) Caprine arthritis-encephalitis
   (C) Listeriosis
   (D) Polioencephalomalacia
   (E) Scrapie
4. A 3-year-old gelding is being evaluated because of mild distress and food reflux from both nostrils. Rectal temperature is 100.2°F (37.9°C), pulse rate is 42/min, and respiratory rate is 12 breaths/min. Gastrointestinal borborygmi are present on examination. Which of the following is the most likely diagnosis?

(A) Cleft palate
(B) Esophageal obstruction
(C) Retropharyngeal abscess
(D) Ruptured stomach
(E) Small intestinal volvulus

5. A 2-year-old cat has a two-day history of anorexia and vomiting. Abdominal radiographs show that the intestines appear bunched up in accordionlike pleats. Which of the following is the most likely cause?

(A) Intestinal adenocarcinoma
(B) Intestinal lymphosarcoma
(C) Intestinal parasites
(D) Intussusception
(E) A string foreign body

6. Which of the following is the most appropriate therapy for swine dysentery?

(A) Lincomycin
(B) Penicillin
(C) Sulfathiazole
(D) Tetracycline
(E) Tilmicosin

7. A 4-year-old intact female Maltese dog has anorexia, fever, severe trembling, and stiffness of the limbs three weeks post partum. Which of the following is the most appropriate emergency therapy?

(A) Intramuscular calcium chloride
(B) Intravenous calcium gluconate
(C) Intravenous dexamethasone
(D) Intravenous 50% glucose
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**SAVE THE DATE**

The end of the year party will be held on April 5th at 12 pm.