

Figuring Out Down Cows

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A “downer cow” can be defined as a cow that is unable or unwilling to stand after being recumbent for 4 or more hours. A variety of metabolic, infectious, toxic, degenerative, and traumatic disorders may result in recumbency. Further, having to examine a cow when she is in the down position is in itself an unusual situation – no one forces a cow to lie down so that she can be examined. As a result, we are out of our usual scenario when examining down animals, and it therefore becomes easier to miss an important clue as to the cow’s medical problem. A consistent, systematic method for evaluating down cows may prove to be helpful for such situations.

To begin, a clear understanding of the animal's production status is necessary for practical and economic decision making. Understanding this from the start helps to ensure that appropriate medications and their withdrawal times are considered for use, should a decision to treat the down cow later be made. This understanding also prevents treatment errors – for example, giving a pregnant cow dexamethasone to reduce inflammation associated with injuries or infections could lead to termination of the pregnancy. The cow’s records should be checked, and her production history, pregnancy status, genetic value, and sentimental value should be considered and later weighed against the expense for treatment and the likelihood for recovery. Check her treatment records – has she been recently treated for a common disease such as milk fever? If so, the cow could be down because of a relapse of that disease; further, low blood phosphate levels can occur in some cows with milk fever, particularly those that brightened up with calcium treatment but don’t have enough strength to push themselves into a standing position. Check the recent reproductive record for the down cow – could she have recently come into estrus, either on her own or as the result of a synchronized breeding program? If so, particular attention should be paid to evaluation of the cow for limb injuries that could result from mounting behavior. If she has recently calved, particular attention should be paid to evaluating the down cow for calving paralysis and uterine infections and tears.

One should also attempt to determine the length of time that the downer has been recumbent, its position while down, and any observed changes in the down animal's position over time. If a cow remains recumbent on the same side for several hours on a hard surface, she may develop pressure damage to the thigh muscles and nerves on the down side. Further, cows may collapse on the weak or injured limb, hiding it from view. The nature of the surface on which the downer was initially found should be considered. Ice, mud, smooth or wet concrete, and steep or loosely soiled slopes may cause healthy cattle to slip and fall. Ill or debilitated cattle that become recumbent on these surfaces are prone to injuries during attempts to rise. Cattle found in down in a splay-legged posture should be carefully evaluated for dislocated hips and fractures of the hind limb bones.

Examination from a distance should mark the onset of the examination. A careful visual appraisal of the ground surrounding the animal may reveal evidence of efforts to rise. Cattle that are recumbent from primary musculoskeletal injuries are typically bright and alert. Profound

depression in a recumbent animal is often indicative of severe systemic diseases of infectious, toxic, or metabolic origin.

During examination of the downer, it is helpful to remain aware of what we consider to be a helpful rule of medicine: “*Common things occur commonly.*” This statement is used to remind the examiner that there are a few common disorders that result in recumbency in cattle. We consider it essential that the examiner consider carefully the following diagnoses when faced with a downer – these diagnoses can be conveniently arranged into a list of “**The 5 M’s of Down Cows:**” Mastitis, metritis, musculoskeletal injuries, metabolic diseases, and massive infection (e.g. pneumonia or peritonitis). Your veterinarian should be consulted for advice on how each of these disorders can be treated. He or she may have additional guidelines for diagnosis that we have failed to include here.

In this list, mastitis implies severe clinical mastitis that makes the cow so sick that she goes down. Such cases are typically caused by coliform bacteria, some severe cases of *Staphylococcus aureus*, and environmental streptococci. The classic case shows edema and heat in the affected quarter, with the milk typically appearing as watery, serum-like, or slightly blood – tinged. Cows that are down because of metritis usually have enlargement of the uterus with malodorous, red-brown discharge; signs of shock (dehydration, cool extremities) are usually present.

Metabolic disease is a broad category that includes milk fever, hypophosphatemia, hypomagnesemia (grass tetany) and severe, often chronic cases of ketosis. These cases can be relatively straightforward; however, in light of the heavy mineral and energy demands imparted by lactation, these disorders can also occur as a consequence of another disease. An example would be the cow with metritis that does not eat; as a result of poor appetite, diseases such as ketosis or hypocalcemia can become superimposed on the initial disease. If not treated successfully, ketosis can progress to hepatic lipidosis, or fatty liver. Together, these conditions can cause a cow to become too weak to stand. To aid in figuring these cases out, it may be helpful to draw a blood sample before treatment is started. If the response to treatment is inadequate, one can then discuss the case with a veterinarian, who may decide to use the blood sample to aid in making a diagnosis. Discuss this strategy with your veterinarian to ensure that the appropriate blood samples are taken and stored in the appropriate blood tubes. Urine, blood, and/or milk samples can be used to detect ketosis.

Most, but not all, milk fever cases occur within 48 hours before or after calving; cool extremities, dullness, slow rumen sounds, and an inability to hold the head up for long (if at all) are common signs. Further, if one performs a rectal examination on cows with milk fever, the characteristic constipation manifests as a rectum that is very full of retained feces. Milk fever can also occur in cows that are lactating, and therefore losing calcium in milk, but not eating adequately to make up for the calcium losses. Sudden changes in gastrointestinal function (e.g. rumen acidosis) can also cause superimposed milk fever signs. Cows affected by hypophosphatemia are often those that are diagnosed initially with milk fever and treated with calcium. These cows brighten and become alert after calcium treatment, but characteristically remain unable to rise. Instead, these cows may push themselves around the pen while on their chest, giving them the name “creeper cows.”

Musculoskeletal disease is a broad category that includes fractures, joint dislocations, tears of large muscles, and ligament injuries to the stifle. Cows in estrus are at increased risk because they are targets for other cows to ride. Other contributory factors include poorly maintained facilities, slick or steep surfaces, and rough handling when groups of cattle are moved through areas such as corners and narrow gateways. Musculoskeletal injuries can also occur if a weak or uncoordinated cow (such as one recently treated for milk fever) struggles to rise and collapses. As mentioned previously, cows that are recumbent on a hard surface for more than a few hours may develop pressure injuries to the large muscle groups of the upper thigh. This muscle damage can be sufficient to make the cow unable to stand. Affected cows are usually bright and alert, excluding those with superimposed milk fever. To detect these problems, careful examination of all limbs, including those held underneath the recumbent cow, must be performed. Given the size of the animal and the difficulties inherent in detecting many of these injuries, a veterinarian should be consulted if musculoskeletal injuries are suspected but cannot be confirmed.

In the above list of the 5 M's of , "massive infection" is the least common condition, but one that warrants prompt diagnosis, owing to the generally poor prognosis and concerns related to limiting the animals' suffering. Massive, fulminant peritonitis is most often the sequel to a perforated abomasal ulcer, a rectal or uterine tear, infection associated with a previous gastrointestinal surgery. If severe enough, pneumonia can result in acute debilitation to the point that the cow becomes a downer. Regardless of the underlying source of massive infection, affected downer cows show a depressed attitude and may groan repeatedly. The cow's recent medical history may be helpful in increasing the index of suspicion of massive infection – look for events such as a difficult calving, surgery, or pneumonia treatment. As for musculoskeletal disease, these infections can be difficult to detect without veterinary consultation.

Treat or euthanize?

When should a down cow be treated, and when should she be euthanized? This decision is as variable in nature as the contributing causes for the downer state and the character and experience of the people who make the decision. In short, there is no clear answer that applies to all scenarios. The most appropriate answer appears to be that each case needs to be judged independently. That stated, let's take a step back and try to address this with some fundamental medical logic. To make a sound decision about whether or not to treat an animal, two steps are necessary beforehand: 1) a thorough assessment of the animal's physical status is made and 2) a determination of the animal's medical problem is made. These are the "tools" that are needed for the dairyman or veterinarian to complete the task of deciding to treat. If recovery is judged to be improbable or treatment of the medical problem is unjustified for economic reasons, the down cow should be euthanized as soon as possible.

If the decision to treat the down cow is made, three conditions must be met if the treatment is to have the best chance of success: 1) the cow's basic needs for nourishment, water, shelter, and comfort must be met, 2) medication (including medication for pain) and other manipulations appropriate for the medical problem should be administered, and 3) a strategy should be put in place to determine when euthanasia should be performed for the cow that does not respond to

treatment. While this fundamental medical logic may seem very obvious to the experienced dairyman, consistent communication of this logic to the workforce is necessary to ensure that welfare concerns for the down cow are consistently met. In the next issue, we will discuss various methods for caring for the downer cow.