Overview
Oxytetracycline didn’t resolve the lameness? We will take a systematic approach to diagnosing lameness in cattle, from the foot to the hip. We will also cover the most common causes of lameness and their treatments.

Objectives:
• Diagnostic techniques for lameness in cattle.
• A review of common causes of lameness and their clinical features.

While lameness issues are common in cattle, they can be difficult to diagnose and treat depending on the type of animal, the management situation, and the diagnostic and treatment modalities available to the practitioner. Often, lameness issues are attributed to the foot (and commonly to foot rot) and the animal is treated empirically with antibiotics and anti-inflammatory drugs. Veterinary care is often sought following one or more failed courses of treatment. While the foot is it the origin of most lameness problems, the ability to differentiate between foot and upper limb problems may allow you to provide more appropriate recommendations to the producer, and potentially avoid violative residues if treatment is not determined to be economically viable.

Lameness Evaluation
• Evaluation at a distance
  o It is important to evaluate the animal from a distance if possible at the prior to beginning other parts of the exam. The posture of the animal should be evaluated, as well as the animal’s ability to bear weight while standing. The animal can also be evaluated at a distance for any obvious wounds, swelling, or abnormal
• Locomotion scoring
  o There are a number of scoring systems used to evaluate lameness in cattle, with the majority of systems designed for scoring lameness of dairy cattle. These scales all have some variability in their definitions of degrees of lameness, and score lameness on a three to five point scale. The ProAction initiative in Canada has established 2 scales for dairy cattle (locomotion and stall lameness scoring: https://www.dairyfarmers.ca/proaction/resources/animal-care). In finished cattle the North American Meat Institute established the NAMI Mobility Scoring System used in the packing industry, rating locomotion on a 4-point scale.
• Physical Examination
  o The importance of the physical examination in the lameness evaluation cannot be overemphasized. If the cause of the lameness is unclear, the examination
should begin at the foot and move up the limb. To examine the foot, the animal must be restrained with the foot tied in a standing position or placed on a tilt table intended for foot work.

Diagnostic Techniques
- Radiographic Imaging
  - Digital and wireless radiographic systems are making it easier for practitioners to utilize this modality in the field.
- Ultrasound
  - Most useful for diagnosis of joint pathology, including septic arthritis and osteochondrosis.
- Arthrocentesis

Specific Conditions
- Disorders of the Foot
  - Many foot problems can be diagnosed with a thorough hoof exam (including use of hoof testers). Common conditions affecting the foot include:
    - White line disease
    - Toe Ulcers
    - Pedal osteitis
    - Sole (Rusterholz) ulcer
    - Digital Dermatitis
    - Septic arthritis of the distal interphalangeal joint may occur secondary to other conditions, including foot rot. Clinical signs include severe lameness, and a characteristic unilateral swelling above the coronary band over the affected claw. Recommended treatment for septic arthritis of the distal interphalangeal joint in adult cattle is facilitated ankylosis of the joint.

- Joint Disorders
  - Septic Arthritis/Physitis
    - Septic arthritis is most often associated with trauma in adult cattle and hematogenous spread of bacteria in calves.
    - Treatment generally requires lavage +/- arthrotomy, local or regional antimicrobial administration, and systemic antimicrobial administration. Treatment is often cost-prohibitive in adults. Prognosis depends on duration of condition and joint affected.
  - Osteoarthritis
    - Stifle, tarsus, and carpus are most often affected. May occur secondary to chronic clinical osteochondrosis.
  - Osteochondrosis dessicans
    - Mild to moderate lameness often with moderate to severe joint distension.
- Coxofemoral Luxation
  - Dorsal and ventral luxations have different clinical presentations, and
    animals experiencing ventral luxations are unable to rise. Diagnosis
    requires manipulation of the rear limb. This requires heavy sedation in
    fractious animals. Palpation of the greater trochanter in a dorsal luxation
    will reveal the greater trochanter in line with the tuber coxae and tuber
    ischia. Failure to palpate the greater trochanter suggests ventral
    luxation.

- Tendon/Ligament Disorders
  - CCL Rupture
    - Stifle swollen/distended and painful to palpation. Drawer test possible in
      some cattle.
    - Most commonly, animals are either culled or treated with NSAID and stall
      rest. Prognosis for return to function is poor. In valuable animals, surgical
      options do exist.
  - Peroneus Tertius Rupture
    - Occurs after hyper-extension of the tarsus while the stifle remains flexed. There
      is damage if the stifle can be flexed while the hock extended or vice versa.
    - Treatment of peroneus tertius rupture is simply stall rest and prognosis
      for return to function is good.
  - Gastrocnemius Rupture
    - With rupture of the gastrocnemius muscle, the animal is unable to bear
      weight on its rear limb, and its hock will be on the ground if it attempts to
      do so. Treatment of gastrocnemius rupture is a full limb cast. If this is not
      possible due to weight, temperament, or economics, humane euthanasia
      is recommended.
  - Upward Fixation of the Patella
    - The patella becomes locked on the medial trochlear ridge of the femur,
      resulting in the affected leg being held in extension behind the animal.
      This is generally an intermittent occurrence.
    - Treatment for upward fixation of the patella is desmotomy of the medial
      patellar tendon. This can be performed in the standing animal and
      carries a good prognosis.
  - Spastic paresis
    - These animals show a characteristic, intermittent caudal movement of
      the hindlimb if the gastrocnemius is affected. Quadriceps and mixed
      forms of spastic paresis have also been reported.
    - Either a gastrocnemius tenectomy or tibial neurectomy is recommended
      for salvage, with the tenectomy being the easier procedure to perform in
      the field. As this condition is often bilateral, the opposite limb may show
      more severe signs following surgical correction.
• **Nerve Disorders**
  o Radial Nerve Paralysis
    ▪ Seen when an animal has been in lateral recumbency on a hard surface. The elbow will be dropped and the carpus will remain partially flexed.
    ▪ Treatment involves a full limb splint to aid the animal in standing. Animals may recover in days to weeks.
  o Peroneal nerve paralysis
    ▪ Animals affected often have a history of recently calving. These cows will knuckle on their hind limbs, and it is often bilateral. This condition often resolves within days.
    ▪ Hydroflotation
  o Femoral nerve paralysis/patellar luxation
    ▪ Seen most often in calves as a result of dystocia, particularly if the calf became hip locked during the delivery. Severe muscle atrophy can be observed within one week, and the calf will have a characteristic crouched stance, as well as difficulty rising. Patellar luxation in cattle almost always occurs secondary to femoral nerve paralysis, though it can occur on its own as a result of trauma in rare instances.

• **Bony Disorders**
  o Sequestrum
    ▪ These are generally associated with chronically draining tracts on the limb and may occur secondary to traumatic injury. Surgical removal is required, and difficulty is dependent on duration and size.
  o Long Bone Fracture
    ▪ With most long bone fractures, the animals are non-weight bearing lame on the affected limb. They may have an obvious angulation of the affected limb, particularly with distal limb or tibia fractures. Femur fractures can be difficult to diagnose due to the large amount of swelling that occurs over the femur following injury.
Selected References