Clostridial Enteritis in Dairy Calves

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Presentation Outline

- What kind of bug is this?
- Where does it hang out?
- What does it mean if I have it?
- What sort of damage does it do?
- What can we treat it with?
- How can we prevent it?
Clostridium

- Bacterium from the family that causes tetanus, botulism, gangrene and overeating disease
- Affects many species
- Found in the burial chambers of the pyramids
- Big reason for gramma’s canning ritual
- 60 strains have been found in silages
What Kind of Bug?

- Gram positive rod (opposite of *E. coli* and *Salmonella*)
- Vegetative (wimp) and spore (invincible) forms
- Can survive for centuries without reproducing in all sorts of environments (like Anthrax)
Where is it found?

- Soil, poorly fermented silages, manure
- Normal gut inhabitant in cattle (and people!)
- Slimy places where air is in short supply
Clostridium in Calves

- From 5 days of age up to 4 months
- Often associated with bloat
- May see occasional blood in manure
- Can kill within hours of being normal
- Severe cases are unresponsive to any and all treatments
- Powerful toxins that paralyze and destroy muscle, blood vessels and nervous tissue
Clostridium Characteristics

- Off feed, dull, normal to full belly
- May kick at belly
- Often no fever or subnormal temp
- Bloat rarely relieves with a stomach tube
- More fullness on right side than left
- Slooshing sounds with some pings
Clostridium Characteristics

- Scours may never show before death
- Surviving calves do not have severe diarrhea
- Calves go into shock and may show neurological signs
- Electrolyte loss and acid-base imbalances are minimal
All of the 5 types of *C. perfringens*, A,B,C,D,E can be found in cattle

“C” is the most common cause of disease in cattle

“A” is the most commonly isolated

All produce alpha toxin, but in different quantities; beta, beta-2, iota and epsilon toxins are the others

Beta-2 is only made by type A
What turns it on?

- This is not well understood
- In adult cows - acidosis, overload of starch carried into the intestines, mycotoxins
- In calves - high feeding rates of milk/replacer; high grain diets; cold milk/replacer; high electrolyte content
The Big Picture

Health Status

- Disease
- Exposure

- Environment
- Stresses

- Immunity
- Nutrition
Components of the Calf's Immune System

- **Innate immunity** - present at birth; non-specific; fast acting; certain blood cells, cough reflex, enzymes
- **Passive immunity** - transfer of specific antibodies as with colostrum; short-lived; no booster possible
- **Acquired immunity** - specific to a challenge; slow but long term; vaccination process
Pathogen Control

- The “numbers game”
- The adult cow world can be a dangerous calf world
- Many germs that seem harmless to adults are deadly to calves
- Don’t forget disinfecting and wearing gloves!
Stress Control

- Starts with dams so they grow a vigorous fetus and do not shed the organism
- Continues with calving process to give calf a good start
- Is critical in first day of calf's life
- Depends on daily routine and level of comfort and nutrition
Identifying the Sources of Challenge

- Calving area - manure
- Transport vehicle - manure, TMR, silage runoff
- Nursery area
- Feeding equipment?
- Clothing and boots
Why has it increased?

- More intensive operations
- More animals on the same location
- More bunker silos
- More contamination of soil and feed harvested from manured ground
- Newer strains like type A?
Diagnosis

- Impossible to be accurate from a live calf
- Samples from a necropsy must be taken ASAP
- Fecal samples from the gut are useless
- *Fresh frozen sampling of the small intestine to identify the toxins is the only reliable method*
**Treatment**

- SubQ or IV fluids, not orally!
- Massive doses of penicillin orally
- Injectable antibiotics?
- Banamine
- Antiserum
- Attempt to relieve bloat
- Surgery?

*Often very frustrating!*
Prevention

- Dry cow vaccination does not stimulate very good colostral protection
- Antiserums (Dybelon) given orally or sub Q
- Vaccination with C&D toxoids after day 5
- Low levels of penicillin in milk for several days
Prevention

- Keep newborns away from adult manure
- Keep runoff away from calf housing areas
- Vaccinate herd to keep the level of shed down
- Sanitize calf environment and feeding equipment
Thank You!

Any Questions?