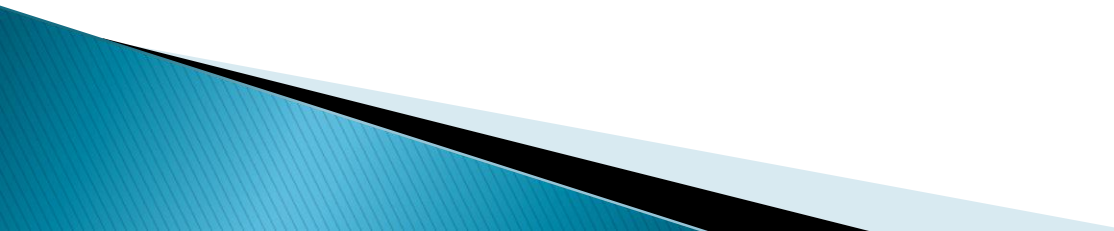


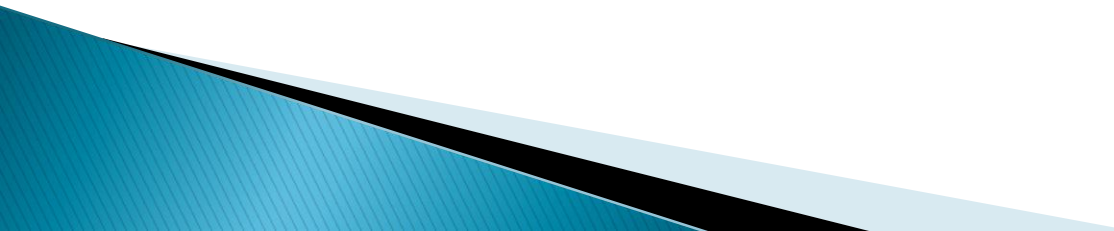
Clostridial Enteritis in Dairy Calves

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NWNV Team/ Pro-Dairy

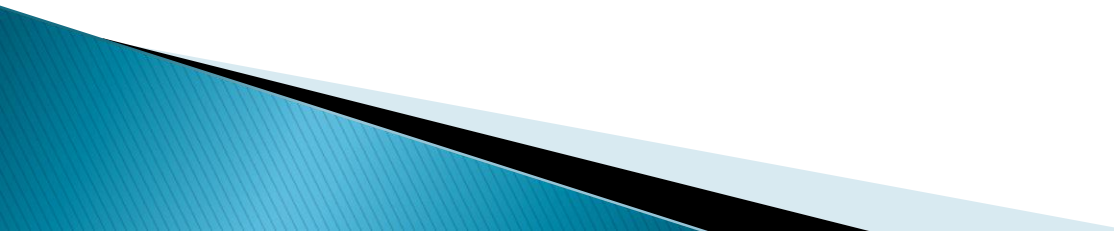
Presentation Outline

- ▶ 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 grandma's canning ritual
 - ▶ 60 strains have been found in silages
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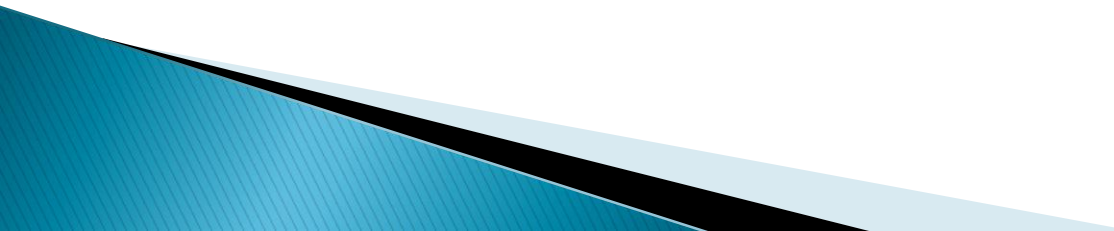
What Kind of Bug?

- ▶ 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)
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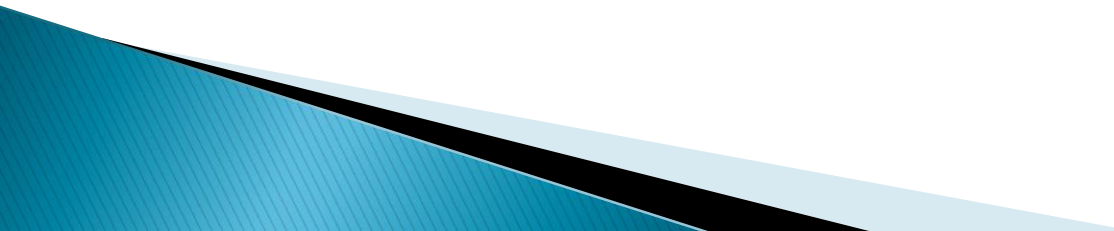
Where is it found?

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

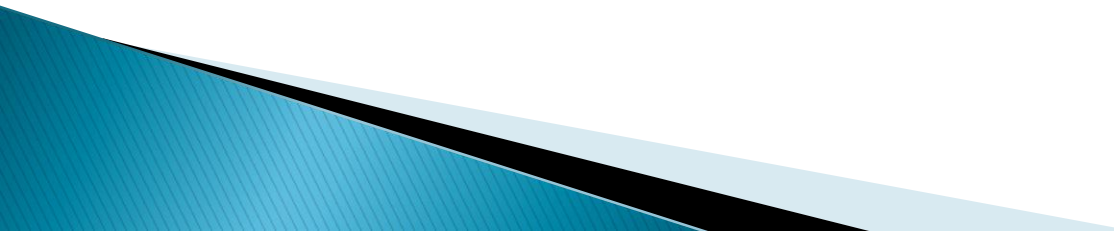
Clostridium in Calves

- ▶ 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
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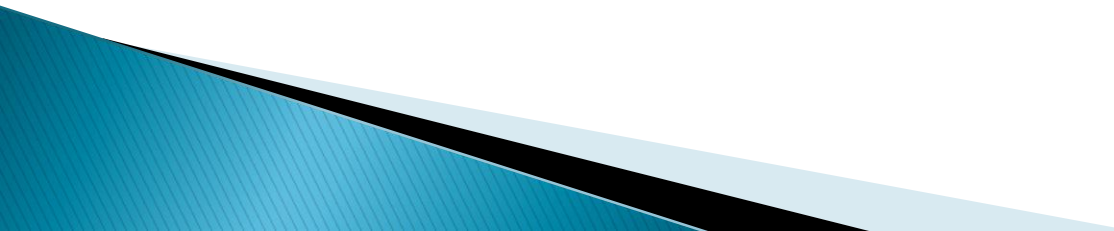
Clostridium Characteristics

- ▶ 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
 - ▶ Sloshing sounds with some pings
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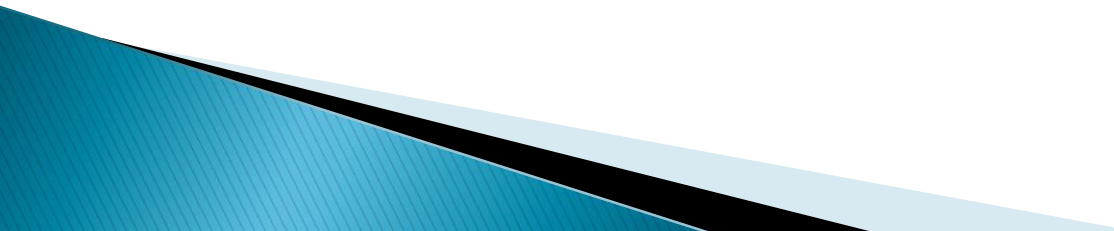
Clostridium Characteristics

- ▶ 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
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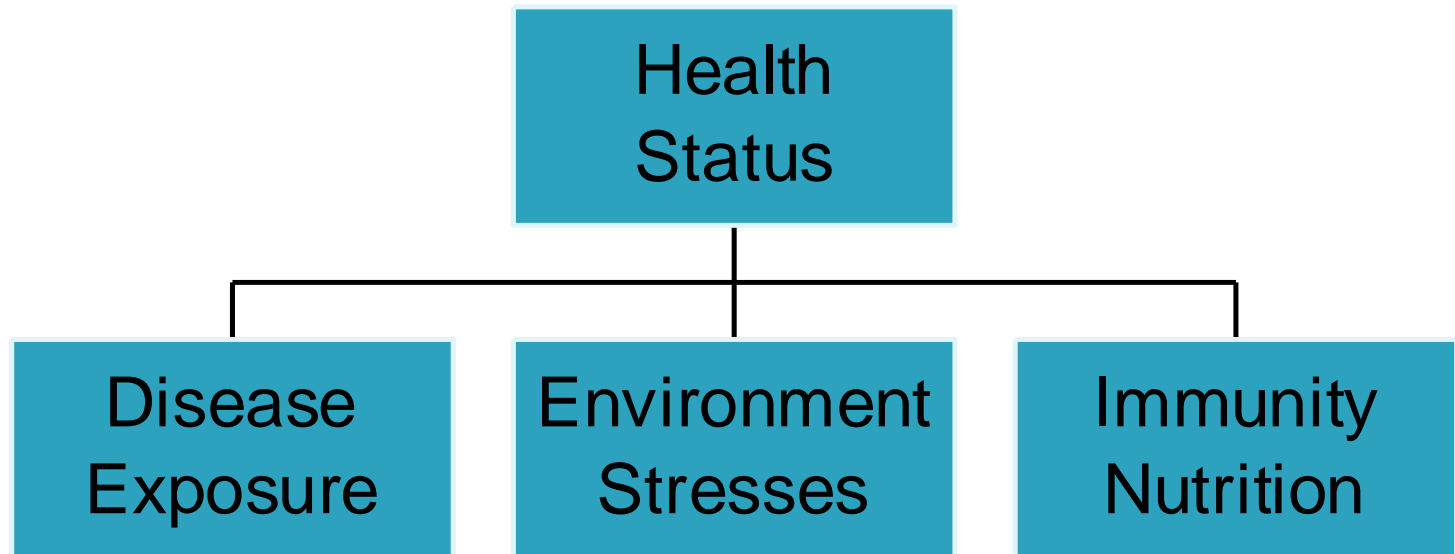
Clostridium in Calves

- ▶ 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
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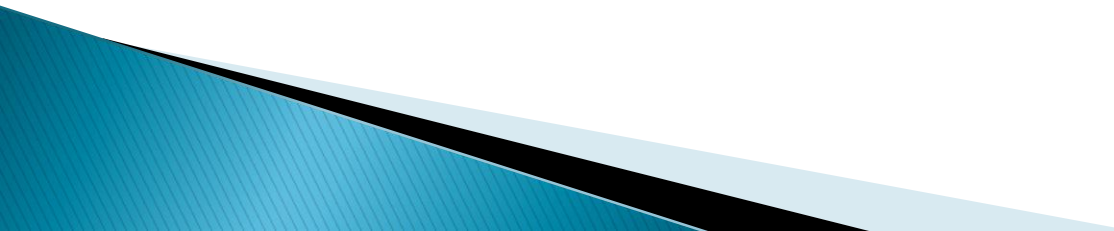
What turns it on?

- ▶ 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
- 

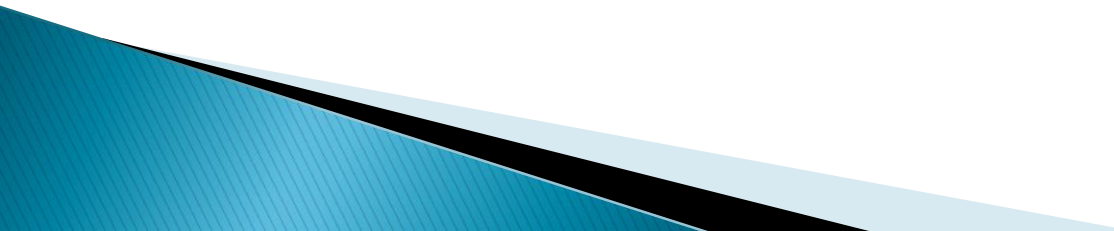
The Big Picture



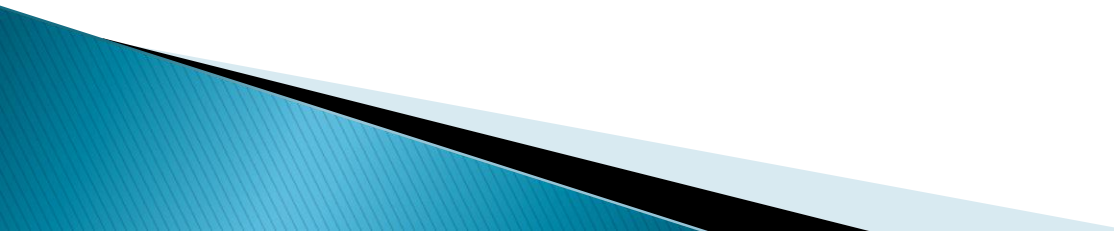
Components of the Calf's Immune System

- ▶ 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
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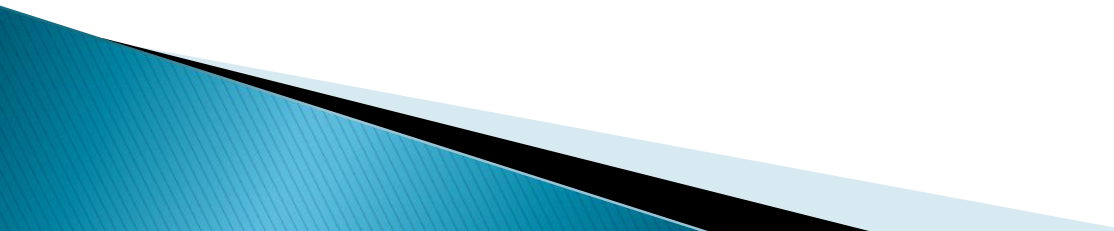
Pathogen Control

- ▶ 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!
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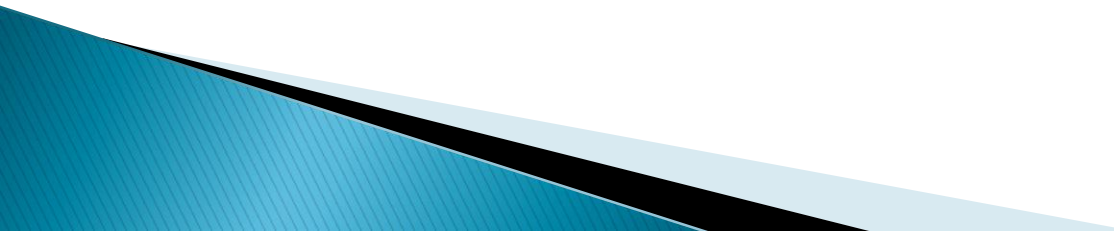
Stress Control

- ▶ 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

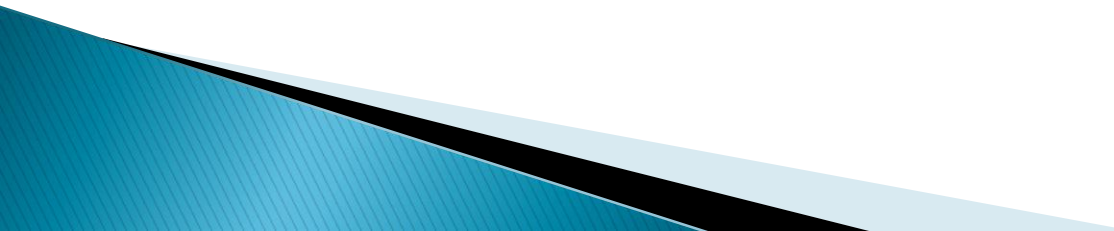
- ▶ SubQ or IV fluids, not orally!
- ▶ Massive doses of penicillin orally
- ▶ Injectable antibiotics?
- ▶ Banamine
- ▶ Antiserum
- ▶ Attempt to relieve bloat
- ▶ Surgery?

Often very frustrating!

Prevention

- ▶ Dry cow vaccination *does not* stimulate very good colostrum 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?

