**CDT Vaccine: When, How, and Why**

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**Introduction**
- There are many different vaccines available on the market for both sheep and goats, but there is only vaccine that is universally recommended: the CDT vaccine.

The CDT vaccine protects all small ruminants against *Clostridium perfringens* type C and D, as well as *Clostridium tetani* (tetanus). These organisms are commonly found in the environment including soil.

*Clostridium perfringens* types C & D
- Also known as “overeating disease”
  - Type C
    - Commonly occurs with excessive milk intake in lambs – usually in single lambs
    - Leads to hemorrhagic/recticolic enteritis
  - Type D – “Pulpy Kidney”
    - Generally affects the largest, fastest growing lambs
    - Commonly occurs with a sudden change in feed
    - Moving onto lush, rapidly-growing pastures
    - Increase in starch intake
    - The bacterial toxin leads to vascular damage in the brain and other tissues
    - Lambs often found dead, but in good condition
      - Lying on side, head thrown back, limbs extended
      - Autopsy demonstrates internal hemorrhages and soft red kidneys
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*Clostridium tetani* - Tetanus
- Can infect animals through open wounds (shearing, docking, castration, etc.) or from unsanitary lambing practices
- Releases toxins into the blood that diffuses into the muscles and nerve endings of the central nervous system
- Typical signs:
  - Tetanic muscle spasms
  - Stiff ears, tails, and limbs
  - Extended head and limbs
  - Lock jaw
  - Dilated nostrils
- Violent muscle contractions eventually lead to exhaustion and death
- Once clinical signs are visible, death is inevitable

**How to Administer the Vaccine**
- CDT vaccine is given subcutaneously – just under the skin
  - Neck
  - Axilla (armpit)
  - Flank
  - Over the ribs
- "Tent" the skin by pinching and place the needle in the base of the tent and press the plunger of the syringe

**Health and Economics**
- ~80% of producers vaccinated at least one sheep or lamb in 2011
  - Mortality for vaccinated lambs: 0.5%
  - Mortality for unvaccinated lambs: 5-10%, with severe outbreaks reporting losses up to 40%
- No real treatment for these clostridial diseases
  - Disease tends to progress so quickly that sheep and goats are often found dead without producers noticing any signs
- Prevention is both affordable and reliable
  - 250 mL bottle = $40.79
  - CDT vaccine is 2mL/treatment
  - Bottle contains 125 doses
  - Cost per dose = $0.33

**When to Vaccinate**
- Pregnant ewes and does should be vaccinated in the last month of pregnancy to capitalize on passive immunity
- Costal immunity decreases over time, so lambs should be vaccinated at 6 weeks with a booster 2-4 weeks later at weaning.
- Rams and bucks should receive an annual CDT booster
- Any purchased animal whose vaccination status is unknown should be vaccinated
- Boosters are recommended in high-risk situations
  - Switching to lush pasture
  - Grain feeding

**Notes:**
- For show and market lambs, the axilla is the best location for injection due to potential swelling associated with vaccination
- Needles should be changed between every 20-30 sheep
- IMMEDIATELY dispose of needles that have fallen on the ground
- Good hygiene measures should always be implemented

**Work Cited**

**Pictures**
2. https://www.sheep.org.nz/resources/101342_1_nsa_000.png
5. https://www.youtube.com/watch?v=Qn2E7-Yzr