

Virginia 4-H Dairy Quiz Bowl Team Study Materials

Section 5. Lactation



- According to the Pasteurized Milk Ordinance (PMO), the maximum legal bacteria count at which raw milk can be sold from the farm is 100,000 bacteria per milliliter.
- Somatic cells are made up of two types of cells – leukocytes and epithelial cells.
- High numbers of somatic cells in milk are generally an indicator of infection, or mastitis.
- US legal limit for somatic cell counts in raw milk
 - <750,000 cells/ml
- US legal limit for bacteria counts in raw milk
 - <100,000 cells/ml
- The limit for somatic cells in the European Community is 400,000 cells/ml.
- Four main types of mastitis:
 - Acute
 - Chronic
 - Clinical
 - Subclinical
- Estrogen is an ovarian hormone that appears to be involved in the development of the mammary gland.
- Major factors involved in bovine mastitis:
 - Cow
 - Microorganisms
 - Environment
- The recommended dry period for dairy cows is 45 to 60 days long.
- Mastitis causing pathogens
 - Contagious pathogens
 - *Staphylococcus aureus*
 - *Streptococcus agalactiae*
 - *Mycoplasma* species
 - Environmental pathogens
 - Coliforms
 - *E. coli*
 - *Enterobacter* species
 - *Klebsiella* species
 - Environmental streps
 - *Streptococcus dysgalactiae*
 - *Streptococcus uberis*
 - Other pathogens
 - *Actinomyces pyogenes* (now called *Arcanobacterium pyogenes*)
 - *Bacillus cereus*
 - Coagulase-positive *Staphylococci*
 - *Corynebacterium bovis*
 - fungi
 - *Nocardia* species
 - Prototheca
 - *Pseudomonas aeruginosa*
 - Serratia
 - *Streptococcus dysgalactiae*
 - yeasts
- Components that decrease in concentration in mastitic milk:
 - Lactose
 - Total proteins
 - Casein
 - Solids not fat
 - Total solids
 - Fat
 - Calcium
 - Phosphorus
 - Potassium
- Components that increase in concentration in mastitic milk:
 - Lipase
 - Sodium
 - Chloride
 - Immunoglobulins
 - Leukocytes
 - Trace Minerals

Virginia 4-H Dairy Quiz Bowl Team Study Materials

Section 5. Lactation

- The five steps in a good mastitis control program are:
 - Use functionally adequate milking equipment in the correct manner
 - Dip teats after milking with an effective product
 - Treat clinical cases immediately with recommended dosages
 - Treat every quarter of every cow at dry off with an effective dry cow product
 - Cull chronic cows
- Maximum oxytocin concentration in blood occurs one minute after beginning of stimulation.
- Long pre-milking stimulation can lead to:
 - Lower production
 - Slower milking time
 - Higher somatic cell count (mastitis problems)
- Cows will normally produce 8 to 15 percent more milk when milked three times a day as compared to those milked twice a day.
- Factors affecting dairy cow environments:
 - Climate
 - Season of the year
 - Herd size
 - Housing type
 - Frequency and duration of confinement housing
 - Management of the cows and facilities
- Sources of environmental bacteria in dairy herds:
 - Feces
 - Bedding
 - Feedstuffs
 - Soil
 - Water
 - Mud
 - Milk from infected quarters
- Factors that can influence milk composition
 - Age of cow
 - Breed
 - Environmental temperature
 - Estrus
 - Genetics
 - Milking procedures
 - Nutrition
 - Season
 - Somatic cell count
 - Stage of lactation
- Signs of a malfunctioning milking system
 - Excessive vacuum fluctuation
 - Flooded milk lines
 - Slow milking
 - Squawking teat cups
 - Teat cups fall off
 - Uneven milk flow
- Vacuum pressure at the teat end at the time of milking should be 12 to 13 inches.
- Three hundred and five day milk production is highest for cows calving in November, December, and January.
- Mastitis is the most costly disease in dairy cattle. It is costly because of...
 - Reduced milk production (64%)
 - Discarded milk (14%)
 - Early cow replacement cost (8%)
 - Reduced cow sale value (5%)
 - Drugs (5%)
 - Veterinarian (3%)
 - Labor (1%)
 - Lost milk premiums (variable)
- Causes of mastitis infections:
 - Failure to teat dip
 - Faulty milking equipment
 - Improper dry cow management
 - Poor housing/environment
 - Poor milking practices
 - Poor sanitation
 - Stray voltage
- Specifically, the only part of the milking system that touches the cow is the teat cup liner or inflation.
- Teat cup liners should be replaced every 1,000 – 1,200 cow milkings.
- When using a teat dip as a pre-dip, the dip should be left on the teat for at least 30 seconds before it is wiped off.
- The main reason for teat dipping after each milking (post-dipping) is to reduce the rate of infection in the udder.
- The two purposes of dry cow antibiotic treatment are:
 - To remove existing infection
 - To prevent new infection
- The most effective time to treat mastitis infections is at drying off.

Virginia 4-H Dairy Quiz Bowl Team Study Materials

Section 5. Lactation

- The two most effective measures one may take to prevent new mastitis infections are:
 - Teat dipping
 - Dry cow antibiotic treatment
- The cow's first line of defense against mastitis infections is the streak canal or teat canal; the second natural line of defense is leukocytes.
- On-farm screening tests used to detect mastitis include:
 - California Mastitis Test (CMT)
 - Conductivity
 - Strip cup
- The main reason that antibiotics are not allowed in milk for human consumption is that some people are allergic to antibiotics. Other reasons are:
 - Milk is not suitable for cheese making
 - Bacteria may become resistant to antibiotics
 - Not a natural part of milk
- Symptoms of clinical mastitis:
 - Flakes
 - Clots
 - Pus
 - Presence of blood
 - Stringy milk
 - Watery milk
 - Swollen quarter
 - Hot quarter
- Conditions that will cause a decrease in butterfat test include:
 - Cow is in heat
 - Extremely hot weather
 - Finely chopped feeds
 - Illness
 - Low fiber content in ration
- The three parts of the teat through which milk passes are:
 - Teat cistern
 - Sphincter muscle
 - Streak canal
- Guidelines for using cloth towels in udder preparation:
 - Use a separate towel for each cow
 - Wash cloth towels between each use using warm water
 - Do not let damp towels sit between uses because of yeast or mold contamination
 - Dry towels immediately after washing or add bleach when washing
- Sources of on-farm milk contamination:
 - Air (dust)
 - Antibiotics
 - Dirt (from outside of the cow)
 - Equipment
 - Feed
 - Insects
 - Interior of udder
 - Water
- Types of milking parlors:
 - Herringbone (most common type in use today)
 - Parabone
 - Parallel
 - Rotary
 - Side opening

