



Group Names (F&L): _____

Hour ____ Date: _____ Score: + ✓ -

Directions: Work with your assigned group to complete this worksheet. When one person is writing, the rest of the group should help them determine what to write. Switch roles after each question. This is a stations lab, meaning that you will move from station to station to complete each of the following sections. You do not have to do each section in the same order that they are listed below.

California Mastitis Test Station

Directions:

1. Fill each cup of the CMT paddle with about a teaspoon of milk (enough to fill each of the four cups when the paddle is turned at a 45° angle).
2. Add a teaspoon of CMT solution to each cup of the paddle. Rotate the paddle for 8-10 seconds (max of 10).
3. Read the results of the test within 20 seconds using the descriptions below:
 - a. **Negative:** no thickening of the mixture; SCC is under 100,000.
 - b. **Trace:** slight thickening; SCC is about 300,000.
 - c. **Weakly Positive:** thickening is observed but no gelling of the mixture. Thickening disappears after 20 seconds. SCC = 900,000.
 - d. **Distinctly Positive:** Immediate thickening is observed followed by slight gelling. As mixture is swirled, it moves toward the center of the cup, forming a slightly elevated center. When motion stops, mixture levels out evenly. 2.7 million SCC.
 - e. **Strongly Positive:** Gel is formed and surface of the mixture becomes elevated (like a fried egg). When rotation stops, this elevated center remains. 8.1 million SCC
4. Wash your paddle with soap and water and answer the questions below. Make sure your station is clean and ready for the next group.

Questions:

1. Briefly summarize what this test is detecting and why it matters. _____

2. What is the SCC count? What does it measure and what does this indicate? _____

3. How did your samples test? Was mastitis prevalent in any samples? What were their SCC counts?

Sample 1: _____

Sample 2: _____

Milking Station

Directions:

1. Human hands are very effective at spreading bacteria to an udder; for this lab, the person milking should be wearing gloves and should have sanitary hands. Because we will be working with a dilute iodine solution, it would be a good idea to also use a lab coat or apron to protect clothing.
2. Begin by prepping the udder. To do so, physically wipe your hand around each udder to remove any large debris and to stimulate the release of oxytocin.
3. Next, dip each teat using pre-dip (diluted iodine). Using a teat dip cup, squeeze the base to move the dip to the upper portion of the cup. Each teat should be dipped in a manner so that it is thoroughly coated in pre-dip.
4. Use a paper dairy towel to wipe-off the teats thoroughly. Be sure to remove all residue. Discard your used towel in the trash.
5. Next, you will need to strip each quarter. To do so, gently grasp a teat between your thumb and forefinger and gently pull downward with a slight squeeze.
 - a. As you do so, check for signs of mastitis in each teat/quarter. These signs include lumpy milk, watery milk, flecks, or spots of blood.
6. Apply the milking unit (or whatever your instructor has provided to you) within one minute of stripping the udder's quarters.
 - a. Keep the teatcups (the portion that attaches to the udder) facing down but off the ground until you are ready to apply them to the teats. This will cut off the vacuum and prevent it from sucking air.
 - b. Before applying a teatcup, kink the hose of the teatcup so that it does not suck air. Bring the opening of the teat cup at the end of the teat and slowly unkink the hose of the teatcup as you work it up the length of the teat. Repeat this process until all four teats have a teatcup on them.
7. Because this is a simulation, we will assume sufficient time has passed to milk each quarter of the udder as soon as you have applied all four teatcups of the milking unit. Remove the milking unit and apply the teat dip. This protects the teats after milking, kills pathogens, and minimizes the exchange of pathogens from cow to cow.
8. Clean up your station so that it is ready for the next group.
9. Answer the questions below.

Questions:

1. Why does the udder need to be stimulated before being sanitized? Answer using the terms "oxytocin" and "Milk Letdown Reflex".

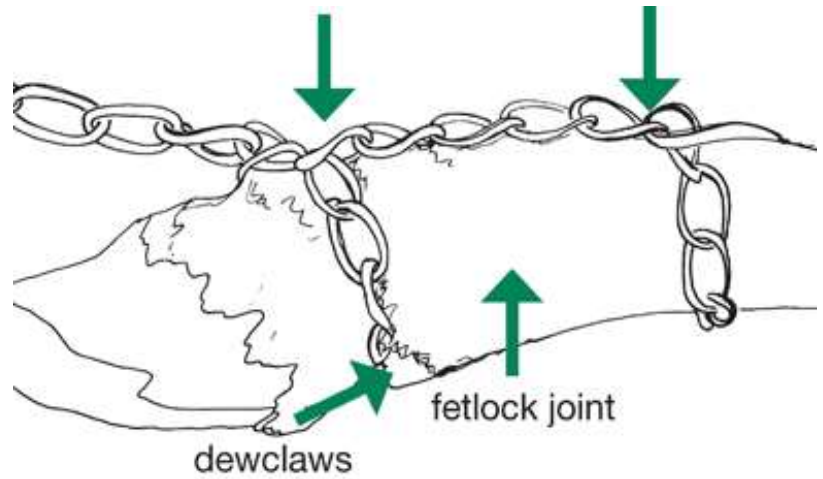
2. Why is it important to dip the cow's teats both before and after milking? _____

3. Why is it necessary to strip each teat before applying the milking unit? _____

Calf Pulling Station

Directions:

1. Take the calf and insert it into the hooded sweatshirt so that the forelegs and nose are sticking out of the neckhole.
 - a. Have a group member hold the sweatshirt for the next steps.
2. Normally we would lubricate the birthing canal and calf to assist the birthing process. Because this is a sweatshirt and not a cow, we're going to use the invisible imagination lubricant for this step.
3. Next you will attach the obstetrical chains. To do so...
 - a. Loop the chain above the fetlock (the 'wrist' of the calf).
 - b. Loop the chain just below the fetlock and run the remainder of the chain under the loop down to the foot.
 - c. Repeat these steps for the other foot.
 - d. When pulling on the legs, pull one leg at a time to avoid wedging the shoulders in the birth canal.
 - e. Use a back and forth motion between the two legs until the calf's head and shoulders are outside the birth canal.
 - f. Once at this point, turn the calf 90° so that it is on its side; this allows the calf's hips to pass through the widest part of the canal more easily (the birth canal is wider from bottom to top than from side to side).
4. Once the calf is out of the birth canal, clear the nostrils of the 'fluid' and stimulate breathing by blowing into the nasal cavity.
5. Immediately dip the navel with an "iodine solution" (whatever your instructor has provided) to prevent an infection.
6. Repeat these steps again, but this time reposition the calf inside the sweatshirt so that it is malpresented (e.g. backwards, or has a leg or head back). Have another member deliver the calf this time.
7. Clean up your station so that it is ready for the next group.
8. Answer the questions below.



Questions:

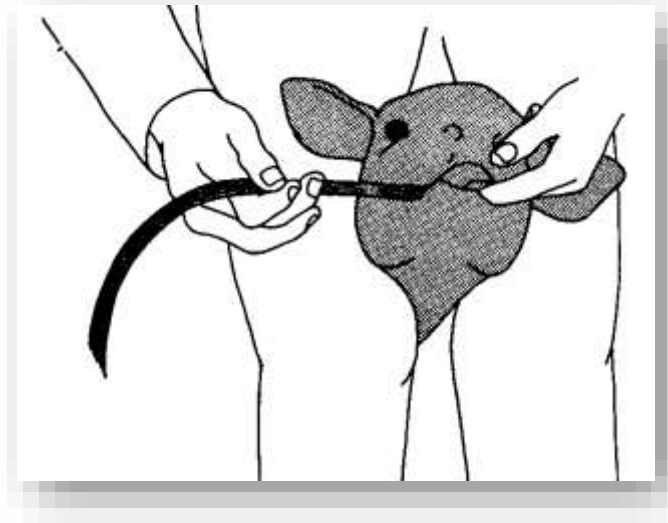
1. Should the calf be pulled by chains every time? Explain how to know when this procedure is needed: _____

2. What precautions or steps need to be taken before the chains are applied (check your notes)? _____

Scours Treatment Station

Directions:

1. An esophageal feeder is designed to deliver fluids directly to a calf's stomach via a tube.
2. Detach and "moisten" the tube of the feeder, and allow the calf to suckle on your finger.
 - a. We won't actually be moistening the tube as this is not a real calf. Just go through the motions.
3. Slowly move the ball of the detached tube to the back of its throat, allowing the calf to start swallowing the tube.
4. Slowly and gently move the tube down its throat, checking to make sure the ball of the tube cannot be felt in the calf's ridged trachea (windpipe).
5. Attach the bottle or pouch and administer the treatment.
6. Clean up your station so that it is ready for the next group.
7. Answer the questions below.



Questions:

1. What is scours and what effect does it have on the calf? How is it detected and how is it caused?: _____

2. What is the proper treatment for scours in a calf? Why is this treatment necessary _____

3. How could scours be prevented? _____

4. How is scours different from Johnes? How is it similar? _____

Sire Selection

Background: you have a small herd of 20 Holstein cows. In general, the cows in your herd are good milkers and each produces a large amount of milk each day. However, the quality of your milk, specifically in regards to fat and protein, is relatively low; this is easily your biggest concern. Your cows also tend to have a short productive life (they may be strong milkers when they first start milking, but their production begins to noticeably decline each year as they age). Finally, you'd like your cows to be stronger to hopefully reduce their likelihood of injury.

On the next page is a copy of a Sire Summary printout for 4 bulls: 1) Magor Bolivia Allen-ET, 2) Mainstream Manifold, 3) Majestic-Manor OM Beacon-ET, and 4) Mar-Bil Magna Geronimo-ET. Use this page to answer the questions below. Focus on their STA rankings on the right hand side to keep it simple. You can abbreviate their names (e.g. MBA, MM, MOB, MMG).

1. Rank the four bulls from best to worst for Milk Protein:

2. Rank the four bulls from best to worst for Milk Fat:

3. Rank the four bulls from best to worst for Productive Life:

4. Rank the four bulls from best to worst for: Strength

5. Based on the information you gave above, which of these four bulls would be the best fit for the needs of your herd? Choose a bull and explain your choice.

Bull:

Explanation:

6. Protein and fat have heritability scores of 0.3, while productive life has a heritability score of 0.13. What do these scores mean and how does this affect your selection of these bulls?

Instructor Notes:

Needed Supplies:

- An 'udder' (made using calf bottle nipples and a bucket) and a second bucket to catch the milk.
- Milk (e.g. 2% will work fine).
- Teat Dip Cup (Nasco: C12739N) and Dairy Towels (Nasco: C10906N)
- California Mastitis Kit (Nasco: C06059N)
- Infected Milk Samples and Control Samples (e.g. store-bought milk).
- Obstetrical Chains (Nasco: C00335N) and Handles (Nasco: C01014N)
- A large stuffed cow (or other stuffed animal as a stand-in) with tubing inserted/glued that is large enough to serve as the windpipe and esophagus.
- Calf Oral Feeder (Nasco: C14788N).
- Bottles/containers of various treatments (scours, antibiotics, etc.).
- A 'milking unit' (either a real one or one made from homemade materials – be creative ;)).
- A hooded sweatshirt (this will serve as the birthing canal for pulling the stuffed calf).