

Calf Care Curriculum



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Authors



Troy Talford has been an agriculture teacher since graduating with a Bachelor of Science Degree in Agricultural Education from the University of Wisconsin – River Falls in 2005. He has spent his entire teaching career at Sauk Prairie High School in Prairie du Sac, Wisconsin teaching a variety of courses encompassing all aspects of agriculture including Horticulture & Greenhouse Management to Biotechnology and Veterinary Science. In 2014, Talford became a National Agriscience Teacher Ambassador and has gone on to become a workshop facilitator for the National Association of Agricultural Educators. Troy understands student development and showcased that knowledge by earning the title of National Board Certified Teacher in the area of Career and Technical Education in 2014. In addition to his role as a teacher in the classroom, Talford serves as one of the two FFA Advisors at Sauk Prairie High School, as well as Trap Shooting Coach, and as an ex-officio member of the Sauk Prairie FFA Alumni & Supporters Board of Directors. He believes learning extends beyond the four walls of his classroom and strives to provide his students with experiences to learn and grow through various means.



Sally Ladsten began teaching Agriculture and Biology at Sauk Prairie High School in Prairie du Sac, Wisconsin after graduating from the University of Wisconsin - River Falls with a Bachelor of Science Degree in Agricultural Education and minor in Biology Education in 2018. She teaches a variety of courses related to life sciences ranging anywhere from Crop Science to Large Animal Health & Nutrition and Fish & Aquaculture. In addition to agriculture she has experience in teaching exploratory Biology and Genetics. Ladsten works to connect the life sciences by encouraging students to take a variety of courses and infusing topics from both Agriculture and Biology into all of the classes she teaches. Sally believes students need to experience growth both in and out of the classroom, and one way she has done this is by working with students as a facilitator for the National FFA Organization to train State FFA Officers. In addition to her role as a classroom teacher, Ladsten serves as one of the two FFA Advisors at Sauk Prairie High School and as an ex-officio member of the Sauk Prairie FFA Alumni & Supports Board of Directors. She believes students need learning opportunities that relate both to classroom content as well as career and life skills and strives to provide students with experiences that will help develop all areas of their learning.

Curriculum Structure

The curriculum is composed of the following lessons. Approximate lesson times are included.

Lesson	Title	Approximate Time
One	Animal Health Assessment	1.5 hours
Two	Esophageal Feeding	1 hour
Three	Castration & Navel Care	1 hour
Four	Tail Vein Injections & Blood Draws	1 hour
	Total	4.5 hours

Lesson Structure

Each lesson begins with a Lesson Overview, Lesson Objectives, and a Lesson at a Glance table which lists the lesson activities, materials required, suggested preparation steps, and approximate class time.

Lesson Sections

The actual lesson follows the Lesson Overview, which will contain some of the sections described below.

FOCUS

Every lesson begins with a FOCUS activity intended to capture participants' attention. This may be in the form of a small or large class discussion, a game, a review of previous lesson information, or a demonstration. During this activity, participants are introduced to the topic of the lesson.

LEARN

The LEARN activity in each lesson varies in its presentation mode. It may be a slide presentation, group activity, or demonstration.

REVIEW

The majority of lessons end with a REVIEW activity intended to briefly review the lesson's key messages or main points.

Lesson One – Animal Health Assessment

Lesson Overview

An effective producer knows that monitoring animal health is a continual task necessary to maximizing profits. This lesson aims for participants to understand the basics of animal health assessment in preparation for evaluating the needs of a newborn calf.

Lesson Objectives

After completing this lesson, participants will be able to:

- Describe the characteristics of a healthy animal and the signs and methods used to assess an unhealthy animal
- Provide examples of abnormalities in general animal health and relate them to the problems and illnesses they may indicate
- List temperature, pulse, and respiration (TPR) rates for calves
- Correctly operate a stethoscope

Lesson at a Glance

Activity	Materials	Preparation	Approximate class time
FOCUS	• Whiteboard, blackboard, or LCD projector • <i>We Think, We Know</i> worksheet	1. Print/photocopy <i>We Think, We Know</i> worksheet (one per participant)	15 minutes
LEARN	• Whiteboard, blackboard, or LCD projector • <i>TPR Chart</i> • <i>Animal Health Assessment</i> slide presentation	1. Print/photocopy <i>TPR Chart</i> (one per participant) 2. Prepare <i>Animal Health Assessment</i> slide presentation for viewing	30 minutes
REVIEW	• Calf Simulator • Thermometers (if available) • Stethoscopes • Clock, stopwatch, or wristwatch • Whiteboard, blackboard, or LCD projector • <i>We Think, We Know</i> worksheet (from FOCUS) • <i>Temperature Demonstration Checklist Teacher Guide</i> • <i>Temperature Demonstration Checklist</i> • <i>Heart Rate Demonstration Checklist Teacher Guide</i> • <i>Heart Rate Demonstration Checklist</i> • <i>Respiration Demonstration Checklist Teacher Guide</i> • <i>Respiration Demonstration Checklist</i> • <i>Animal Health Assessment</i> slide presentation	1. Print/photocopy <i>Temperature Demonstration Checklist, Heart Rate Demonstration Checklist, and Respiration Demonstration Checklist</i> (one per participant)	45 minutes

Lesson One – Animal Health Assessment

FOCUS: Animal Health Assessment

15 minutes

Purpose:

Participants will work together to determine what defines a healthy animal.

Materials:

- Whiteboard, blackboard, or LCD projector
- *We Think, We Know* worksheet
- *Animal Health Assessment* slide presentation

Facilitation Steps:

1. **Slide 2:** Using the “Think, Pair, Share” technique, have participants work on their own for 5 minutes to come up with a list of items they feel can allow them to declare a young calf healthy. Participants should record this on the “We Think” column of their worksheet.
2. After 5 minutes, have participants partner up and share out their responses. Give them 3 minutes to add any new items to their “We Think” column on their worksheet.
3. **Slide 3:** After participants have shared their responses, share the list of items that can identify a healthy animal using the slide presentation.

Healthy Animals:

- a. Eyes: lacking mucus; clear, pink membranes
- b. Alertness: animal pays attention to surroundings and responds to noise
- c. Contentment: animal is calm and relaxed
- d. Appetite: animal eats appropriately
- e. Hair or fur coat: free of pests, sleek, shiny
- f. Feces and urine: normal coloration; passes easily
- g. TPR: normal temperature, pulse, respiration rate

Name: _____ Class: _____

We Think, We Know

We Think	We Know

Lesson One – Animal Health Assessment

LEARN: TPR

30 minutes

Purpose:

Participants will learn how to assess TPR for cattle.

Materials:

- Whiteboard, blackboard, or LCD projector
- *TPR Chart Teacher Guide*
- *TPR Chart*
- *TPR Chart – Answer Key*
- *Animal Health Assessment* slide presentation

Facilitation Steps:

1. **Slides 4-5:** Begin this portion of the lesson by explaining the purpose of a veterinarian conducting a health check on your cattle herd. Highlight common reasons, such as administering vaccinations through various methods, checking an animal's progress from a previous health concern, dehorning, castration, etc.

2. **Slide 6:** One of the basic techniques for a veterinarian to gather TPR. Explain that we are going to learn how to gather such information in this lesson.

Consider reviewing the proper use of a stethoscope with participants before conducting this lesson.

3. **Slides 7-10:** There are two methods of taking temperature on cattle. Direct your participants to review the vital signs chart to observe what normal temperature ranges for cattle should be. You may explain to participants that if the temperature is too high, this could be a sign that the animal has a disease or a viral infection. There are also "false readings" that may occur with extreme hot or cold weather, or if the animal is overly excited or anxious.
 - a. Digital thermometer: Unlike a mercury thermometer, there is less risk of a digital thermometer breaking inside the animal in the event that the animal

becomes anxious and begins to move around more. To use the digital thermometer, turn it on, lubricate it, and insert the tip into the animal's rectum for approximately one minute. Some digital thermometers beep when a reading is complete.

- b. Mercury thermometer: For a mercury thermometer, you must first shake the thermometer until the temperature drops below 95 degrees Fahrenheit. Proceed to lubricate the thermometer, then insert it into the animal's rectum until the thermometer is $\frac{3}{4}$ of the way into the rectum. You may have to wait up to three minutes before taking a reading. You can also attach a string or clip to the thermometer to keep it from falling in the event that it falls out of the rectum.

4. **Slides 11-15:** When assessing the pulse rate, look for frequency, rhythm, and quality of pulse. Refer to the vital signs chart for the appropriate frequencies. Frequency in bpm (beats per minute) can be measured either by counting heartbeats for 10 seconds, then multiplying by 6 ($10 \times 6 = 60$); or for 15 seconds and multiplying by 4 ($15 \times 4 = 60$). Rhythm refers to irregularities in the beat itself, whereas Quality refers to the amount of tension in the blood vessel (firm vs. soft to the touch). Determining the pulse rate on cattle can be done in several ways:

- a. Head: You can place your hand over the external maxillary artery on the lower jaw. This is located just in front of the masseter muscle. Reference the image from:
iowabeefcenter.org/bch/vitalsigns.pdf
- b. Inner dewclaw: Palpate with your fingers on the soft spot just above the inner dewclaw.

- c. Hock: Place a hand just above the cattle's hock joint.
 - d. Heart sounds: Using a stethoscope on the animal's left side, press firmly just behind the elbow. You may have to move your stethoscope around to find an accurate sound. Note that if you go too high, you will pick up lung sounds.
5. **Slides 16-17:** Just like with heart rate, respiratory rate can be evaluated by rate and quality. Respiration rate itself can simply be measured by counting the number of breathing cycles (one cycle being one breath in and one breath out). Refer to the vital signs chart for the appropriate frequencies. Frequency can be measured in 30 seconds and multiplied by 2 ($30 \times 2 = 60$). To assess the respiration quality, you will need to listen to the chest of the animal through the stethoscope. The location is on the left side of the animal and just above the elbow. Variations from normal ranges would include wheezing and crackling. Wheezing would indicate an obstruction of the airways, while crackling would indicate that fluid is present in the airways.

TPR Chart Teacher Guide

Introduction: This chart can be used as a reference throughout the Animal Health Assessment Lesson.

Steps for using the TPR Chart Worksheet:

Step 1: Direct participants to fill in the missing vital signs on the chart. This could be used as a group discussion with participants predicting what the vital signs are prior to being given the accurate vital signs, or a research assignment for participants to determine the vital signs using their resources.

Key Terms and Definitions:

- Temperature: Degree of internal heat
- Heart rate: The number of heart beats in one minute
- Respiration rate: The number of breathing cycles in one minute

Resources:

<https://www.lexico.com/en/definition>

Name: _____ Class: _____

TPR Chart

	Temperature	Pulse	Respiration
Calf			
Adult Cattle			

TPR Chart – Answer Key

	Temperature	Pulse	Respiration
Calf	101.5-103°F	100-140 beats per minute	30-60 breathing cycles per minute
Adult Cattle	100.4-102°F	48-84 beats per minute	26-50 breathing cycles per minute

Resources:

<http://www.vvcvets.com/vital-signs.html>

Lesson One – Animal Health Assessment

REVIEW: TPR Demonstrations

45 minutes

Purpose:

Participants will learn how to assess TPR for cattle.

Materials:

- Whiteboard, blackboard, or LCD projector
- Thermometers (if available)
- Stethoscopes
- Clock, stopwatch, or wristwatch
- *We Think, We Know* worksheet (from FOCUS)
- *Temperature Demonstration Checklist Teacher Guide*
- *Temperature Demonstration Checklist*
- *Pulse Demonstration Checklist*
- *Pulse Demonstration Checklist Teacher Guide*
- *Respiration Demonstration Checklist*
- *Respiration Demonstration Checklist Teacher Guide*
- Calf Simulator

Facilitation Steps:

1. For each demonstration, have a copy of the checklist for each participant. Have participants come up to the calf simulator one at a time and ask them to demonstrate how to take temperature, heart rate, and respiration. Use the checklist to confirm each participant's mastery of the material.
2. **Slide 18:** Have participants come up and demonstrate how to conduct both a digital and mercury thermometer reading. Use the *Temperature Demonstration Checklist* as an assessment if desired.
3. **Slide 19:** Have participants come up and demonstrate where to take heart rates on cattle. Use the *Pulse Demonstration Checklist* as an assessment if desired. You may also want to ask participants what the desired heart rate should be for this animal.
4. **Slide 20:** Have participants come up and demonstrate where to take respiratory rates on cattle. Use the *Respiration Demonstration Checklist* as an assessment if desired. You may also want to ask participants what the desired heart rate should be for this animal.
5. **Slide 21:** Use the *We Think, We Know* worksheet as an exit ticket. Provide participants with 3 minutes to document what they now know from the lesson under the "We Know" column.

Temperature Demonstration Checklist

Teacher Guide

Introduction: This assessment should be completed following the Animal Health Assessment lesson.

Materials needed: Digital and/or mercury thermometer, Realityworks Calf Simulator

Steps for using the Rectal Temperature Demonstration Checklist:

Step 1: Have participants come up individually to demonstrate how to properly take a rectal temperature reading.

Step 2: When each participant comes to the simulator, ask them to demonstrate how to take a rectal temperature reading. While demonstrating, participants should explain what step they are completing and how they are going about completing it.

Step 3: As a participant completes each step, check off the step completed and make note of any additions or corrections that should be considered when completing the step in the future.

Key Terms and Definitions:

Rectum: The final section of the large intestine, ending at the anus

Thermometer: Instrument used to measure temperature

Resources:

<https://www.lexico.com/en/definition>

Name: _____ Class: _____

Temperature Demonstration Checklist

Rectal Temperature Demonstration Checklist	
Step 1. Preparing Thermometer (Digital)	☐ Turn on the thermometer ☐ Lubricate the thermometer Comments:
Step 1. Preparing Thermometer (Mercury)	☐ Check temperature, if not below 95°F shake thermometer until temperature is reached ☐ Lubricate the thermometer Comments:
Step 2. Insert thermometer	☐ Digital: simulate inserting the tip of the thermometer into the rectum ☐ Mercury: simulate inserting $\frac{3}{4}$ of the thermometer into the rectum Comments:
Step 3. Take reading	☐ Digital: wait about one minute or until thermometer beeps, simulate reading the thermometer and make note of the temperature ☐ Mercury: wait about three minutes, then simulate determining the temperature by reading the level of the mercury Comments:

Pulse Demonstration Checklist Teacher Guide

Introduction: This assessment should be completed following the Animal Health Assessment lesson.

Materials needed: Stethoscope, clock with a second hand, Realityworks Calf Simulator

Steps for using the Heart Rate Demonstration Checklist:

Step 1: Have participants come up individually to demonstrate how to properly take a heart rate reading.

Step 2: When each participant comes to the simulator, ask them to point out the four locations to take a heart rate reading on a calf. For each location, the participant should demonstrate how to determine the heart rate in that location. While demonstrating, participants should explain how they are going about collecting the heart rate.

Step 3: As a participant demonstrates each location, check off the location completed and make note of any additions or corrections that should be considered when completing the step in the future.

Key Terms and Definitions:

Elbow: joint between humerus (front upper limb) and radius (front forelimb)

External maxillary artery: attached to the upper jaw

Hock: joint between tibia and metatarsus

Inner Dewclaw: vestigial digit found above the inner-most hoof

Palpate: to examine by touch

Stethoscope: instrument used to listen to internal functions such as heartbeat and respiration

Resources:

<https://www.lexico.com/en/definition>

Name: _____ Class: _____

Pulse Demonstration Checklist

Heart Rate Demonstration Checklist	
Head	☐ Locate where the external maxillary artery on the lower jaw would be ☐ Simulate placing a hand on the artery ☐ State that you would count the number of beats in 10 seconds and multiply the number by 6 to get the total rate per minute Comments:
Inner Dewclaw	☐ Locate where the soft spot just above the inner dewclaw would be ☐ Simulate palpating the area with your fingers ☐ State that you would count the number of beats in 10 seconds and multiply the number by 6 to get the total rate per minute Comments:
Rear Leg	☐ Locate where the cattle's hock joint ☐ Simulate placing hand just above the hock joint ☐ State that you would count the number of beats in 10 seconds and multiply the number by 6 to get the total rate per minute Comments:
Heart Sounds	☐ Locate the elbow on the left side of the animal ☐ Simulate placing the stethoscope just behind the elbow and moving the stethoscope around until accurate heart sounds are observed ☐ State that you would count the number of beats in 10 seconds and multiply the number by 6 to get the total rate per minute Comments:

Respiration Demonstration Checklist

Teacher Guide

Introduction: This assessment should be completed following the Animal Health Assessment lesson.

Materials needed: Stethoscope, clock with a second hand, Realityworks Calf Simulator

Steps for using the Heart Rate Demonstration Checklist:

Step 1: Have participants come up individually to demonstrate how to properly take respiration rate and monitor the respiration quality.

Step 2: When each participant comes to the simulator, ask them to demonstrate how to determine the animal's respiration rate, explaining the process as they go. Once the respiration rate demonstration is completed, have the participant demonstrate how to monitor respiration quality, again explaining the process as they go.

Step 3: As each participant demonstrates, check off the steps completed and make note of any additions or corrections that should be considered when completing the step in the future.

Key Terms and Definitions:

Abdominal Cavity: cavity reaching from the diaphragm to the pelvic cavity, housing the digestive tract

Crackling: abnormal lung sounds that make a clicking or rattling noise

Respiration: the act of breathing

Stethoscope: instrument used to listen to internal functions such as heartbeat and respiration

Wheezing: whistling or rattling sound in the chest

Resources:

<https://www.britannica.com/science/abdominal-cavity>

<https://www.lexico.com/en/definition>

<https://www.easyauscultation.com/crackles-lung-sounds>

Name: _____ Class: _____

Respiration Demonstration Checklist

Heart Rate Demonstration Checklist	
Step 1: Determine respiration rate	☐ Stand near the calf so you can easily see the abdominal cavity as it moves during respirations ☐ State that you would count the number of breathing cycles in 30 seconds and multiply the counted number by 2 to determine the respiration rate per minute Comments:
Step 2: Locate where to monitor respiration quality	☐ Place the stethoscope on the left side of the calf just above the elbow ☐ Simulate listening for respiration sounds to determine you are in the correct location Comments:
Step 3: Monitor respiration quality	☐ Simulate monitoring the respiration quality for several breathing cycles ☐ State that you would pay close attention to ensure there are no wheezing or crackling sounds Comments:

Sources

1. Dr. Lynae Schott, DVM; Sauk Prairie Veterinary Clinic
2. <https://www.merckvetmanual.com/special-subjects/reference-guides/normal-rectal-temperature-ranges>
3. <https://www.lexico.com/en/definition>
4. <https://www.britannica.com/science/abdominal-cavity>
5. <https://www.lexico.com/en/definition>
6. <https://www.easyauscultation.com/crackles-lung-sounds>
7. <https://www.lexico.com/en/definition>
8. <http://www.vvcvets.com/vital-signs.html>

Lesson Two – Esophageal Feeding

Lesson Overview

When a calf is born, there are certain calf care management procedures to be conducted to ensure that your animals are healthy. This lesson will teach participants how to use an esophageal feeder.

Lesson Objectives

After completing this lesson, participants will be able to:

- Identify parts of an esophageal feeder and alternative names for the feeder
- List and demonstrate the proper technique of administering fluids using an esophageal feeder

Lesson at a Glance

Activity	Materials	Preparation	Approximate class time
FOCUS	• Whiteboard, blackboard, or LCD projector • <i>Esophageal Feeding</i> slide presentation • <i>Calf Care Management Priorities</i> worksheet	1. Print/photocopy <i>Calf Care Management Priorities</i> worksheet (one per participant)	10 minutes
LEARN	• Whiteboard, blackboard, or LCD projector • Calf Simulator • Esophageal feeder (included with simulator) • Additional examples of esophageal feeders if available • <i>Esophageal Feeding</i> slide presentation • <i>Esophageal Feeder Components</i> worksheet • <i>Esophageal Feeder Methods</i> worksheet	1. Print/photocopy <i>Esophageal Feeder Components</i> , and <i>Esophageal Feeder Methods</i> worksheets (one per participant) 2. Prepare <i>Esophageal Feeding</i> slide presentation for viewing	35 minutes
REVIEW	• Whiteboard, blackboard, or LCD projector • Calf Simulator • Esophageal feeder (included with simulator) • <i>Esophageal Feeding</i> slide presentation • <i>Esophageal Procedure Demonstration Checklist</i> (may be incorporated during the lesson) • <i>Esophageal Feeding Exit Ticket</i>	1. Print/photocopy <i>Esophageal Procedure Demonstration Checklist</i> and <i>Esophageal Feeding Exit Ticket</i> (one per participant)	15 minutes

Lesson Two – Esophageal Feeding

FOCUS: Calf Care Priorities

10 minutes

Purpose:

Participants will read the scenario and prioritize animal management tasks to be completed.

Materials:

- Whiteboard, blackboard, or LCD projector
- *Esophageal Feeding* slide presentation
- *Calf Care Management Priorities* worksheet
- *Calf Care Management Priorities* worksheet – Answer Key

Facilitation Steps:

1. Talk participants through slides 2-5, introducing them to the farmer who needs assistance.
2. Ask participants to use the *Calf Care Management Priorities* worksheet and have them prioritize when they think animal management tasks should be accomplished. Give participants five minutes to record their thoughts.
3. Have participants share their priorities.
4. Explain that the purpose of today's lesson is to learn the proper techniques to calf care management.

Name: _____ Class: _____

Calf Care Management Priorities

Rank the following task list in order of priority, with 1 being the most urgent task and 6 being the least urgent.

Calf Management Tasks:

- ____ Vaccinate
- ____ Dip navel
- ____ Castrate (if male)
- ____ Ear tag
- ____ Visual health check
- ____ Provide colostrum through esophageal feeding (if needed)

Calf Care Management Priorities – Answer Key

Rank the following task list in order of priority, with 1 being the most urgent task and 6 being the least urgent.

Calf Management Tasks:

5 Vaccinate

1 Dip navel

6 Castrate (if male)

4 Ear tag

2 Visual health check

3 Provide colostrum through esophageal feeding (if needed)

*Have a discussion about these items and be sure to explain that the order may fluctuate depending on the producer and management procedures for a given farm or ranch.

Lesson Two – Esophageal Feeding

LEARN: Esophageal Feeding

35 minutes

Purpose:

Participants will learn how feed a calf using the esophageal feeding method and how to successfully care for a navel of a newborn calf.

Materials:

- Whiteboard, blackboard, or LCD projector
- Calf Simulator
- Esophageal feeder (included with simulator)
- Additional examples of esophageal feeders if available
- *Esophageal Feeding* slide presentation
- *Esophageal Feeder Methods* worksheet
- *Esophageal Feeder Methods* worksheet – Answer Key
- *Esophageal Feeder Components* worksheet
- *Esophageal Feeder Components* worksheet – Answer Key

Facilitation Steps:

1. **Slide 6:** Begin this portion of the lesson by explaining to the class the significance of monitoring a newborn animal. This is important because if a cow neglects her calf, the animal will not get the healthy start to its life necessary for survival.
2. The first assessment one needs to make regarding calf care is to monitor if the cow has neglected her calf and is not allowing it to get the colostrum it needs.
3. **Slide 7:** What is colostrum? According to www.infovets.com, colostrum is the first milk produced by the cow after calving. Colostrum contains antibodies that help fend off diseases early on in a calf's life.
4. Ideally, a calf would receive colostrum from a mother within the first few hours after delivery. If the cow neglects the calf and won't allow it to nurse, human intervention may be necessary.

5. **Slide 8:** The method of intervention is known as esophageal feeding. This is known by other names as well, including “tube feeding” and “drenching.”
6. Explain to the participants that they should understand the basic components of an esophageal feeder. Use the feeder from the simulator as a visual for the participants. Participants can label the parts on the worksheet titled “Esophageal Feeder Worksheet”
 - a. Standard Components
 - i. Bottle or Bag (depending on the type or brand)
 - ii. Tube
 - b. Optional Components
 - i. Clamp or Crimp
 - ii. Probe
7. **Slide 9-11:** How to properly use an esophageal feeder. Use the calf simulator to demonstrate these techniques as you are explaining them. Participants should fill in the *Esophageal Feeder Method* worksheet.

If using this method for colostrum, you should give 4 quarts (1 gallon) in the first 24 hours of a calf's life. It is suggested that at least two quarts of colostrum are administered within the first 6 hours after birth. Over time, the calf's body will change and not absorb antibodies effectively.

- a. Fill the bottle or bag with the fluid you are administering.
- b. If you have a clamp or crimp, make sure it is closed so you do not lose the liquid through the tube or probe. If your device does not have a clamp or crimp, you may have to hold the bottle or bag upside down to prevent the flow of the fluid through the tube or probe.
- c. Restrain your calf by backing it up in a corner or next to a wall or fence. If necessary, you may ask for assistance

- from someone to help restrain the animal.
- d. Facing the same direction as the calf, place the calf's head between your legs to keep the head secure.
 - e. If you moisten the tip of the probe and tube, it will slide in easier. Use colostrum for a real calf and soapy water for the Calf Simulator.
 - f. To open the mouth of the calf, you can insert your finger into the corner of the mouth and gently pry open the jaw.
 - g. Gently insert the tip of the tube or probe into the calf's mouth and ensure that it stays on the top side of the tongue.
 - h. Continue sliding the tube or probe to the far left of the calf's mouth. If you feel the neck of the animal, you will feel both the trachea and esophagus. The trachea is firm with rings or ridges, while the esophagus (on the animal's left side of the neck) will be firm but smooth.
 - i. Again, if you don't have a crimp or clamp do not raise the bottle or bag above the calf's head to prevent the fluids from flowing. You can also manually crimp the tube by bending it in half. This prevents any fluids from entering the calf's lungs during this process
 - j. Try not to force the tube down the esophagus. Allow the animal to start swallowing and gently start to slide the tube down. If the animal struggles and doesn't allow you to insert the tube or probe into the esophagus, gently remove it and start the process over. If inserted correctly, you will be able to feel the bulb on the end of the probe while feeling the esophagus from the outside of the neck. If you can't feel the bulb, you are most likely in the trachea and will need to remove the probe and begin again.
 - k. After you have administered the fluids, make sure to crimp or clamp the tube before removing it in case there are any remaining fluids in the bag or bottle. This prevents aspiration into the lungs when removing the tube.
- l. Follow proper cleaning and disinfecting procedures when finished, as fat and proteins can congeal inside of the tube or probe and bottle or bag.
8. **Slide 12:** Explain to participants that there may be other situations where using an esophageal feeder may be necessary later in calves' lives. These may include:
 - a. Calves that have scours and are not good at nursing from the mother tend to get dehydrated and need fluids with electrolytes to build up their fluid levels.
 - b. Used to target different internal parasites like round worms, tapeworms, and flukes.
 9. Hand out the *Esophageal Feeder Components* worksheet. Have participants identify the main components of an esophageal feeder while reviewing them in class with the provided feeder.

Name: _____ Class: _____

Esophageal Feeder Methods

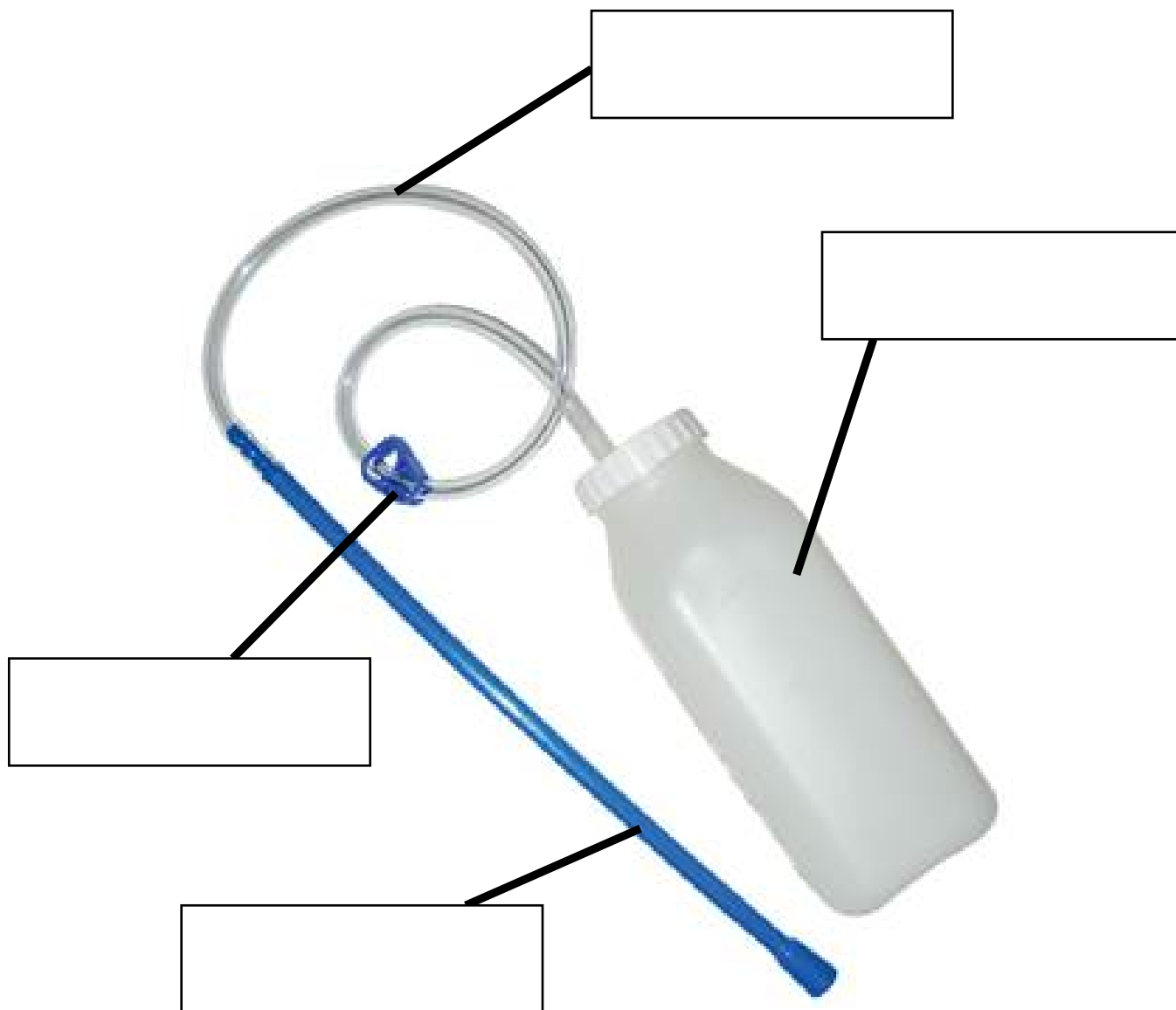
1. The esophageal feeder method is:
2. If using this method for colostrum, you should give ____ quarts in the first 24 hours of a calf's life. At least 2 quarts should be administered within the first 6 hours after birth.
3. Steps to using an esophageal feeder:
 - Step 1: Fill _____ or _____ with fluid
 - Step 2: Clamp or crimp _____ (may have to hold bag upside down to prevent flow of fluid)
 - Step 3: _____ (back into corner or brace against wall or panel)
 - Step 4: Face same _____ as _____, place _____ between _____.
 - Step 5: Moisten _____ of _____ and _____
 - Step 6: Open _____ using finger in corner of their _____ to pry open.
 - Step 7: Gently insert _____ of _____ or probe into _____ on top of _____.
 - Step 8: Slide tube/probe to _____ of calf's mouth towards _____
 - Step 9: Elevate calf's _____ and _____ or _____
 - Step 10: Allow _____ to start swallowing and continue _____
 - Step 11: After fluid is administered _____ or _____ tube before removing it _____.
 - Step 12: Properly _____ and _____ equipment when finished
4. If the animal struggles while inserting the tube, what should you do?
5. Besides administering colostrum, esophageal feeding may also be used when
 - a.
 - b.

Esophageal Feeder Methods – Answer Key

1. The esophageal feeder method is: **a method that allows producers to administer fluids to calves that are unwilling or unable to drink.**
2. If using this method for colostrum, you should give **4** quarts in the first 24 hours of a calf's life. At least 2 quarts should be administered within the first 6 hours after birth.
3. Steps to using an esophageal feeder:
 - Step 1: Fill **bottle** or **bag** with fluid
 - Step 2: Clamp or crimp **tube** (may have to hold bag upside down to prevent flow of fluid)
 - Step 3: **Restrain animal** (back into corner or brace against wall or panel)
 - Step 4: Face same **direction** as **calf**, place **head** between your **legs**
 - Step 5: Moisten the **tip** of the **probe** and **tube**
 - Step 6: Open **calf's mouth** using finger in corner of their **mouth** to pry open.
 - Step 7: Gently insert **tip** of **tube** or probe into **mouth** on top of **tongue.**
 - Step 8: Slide tube or probe to **far left** of calf's mouth towards **esophagus.**
 - Step 9: Elevate calf's **head** and raise **bottle or bag.**
 - Step 10: Allow **animal** to start swallowing and continue **sliding tube.**
 - Step 11: After fluid is administered **clamp or crimp** tube before removing it **slowly.**
 - Step 12: Properly **clean** and **disinfect** equipment when finished.
4. If the animal struggles while inserting the tube, what should you do?
Remove the tube and begin again
5. Besides administering colostrum, esophageal feeding may also be used when
 - a. **Calves with scours are dehydrated and unable to get electrolytes on their own**
 - b. **Calves with internal parasites need medication and nutrients**

Name: _____ Class: _____

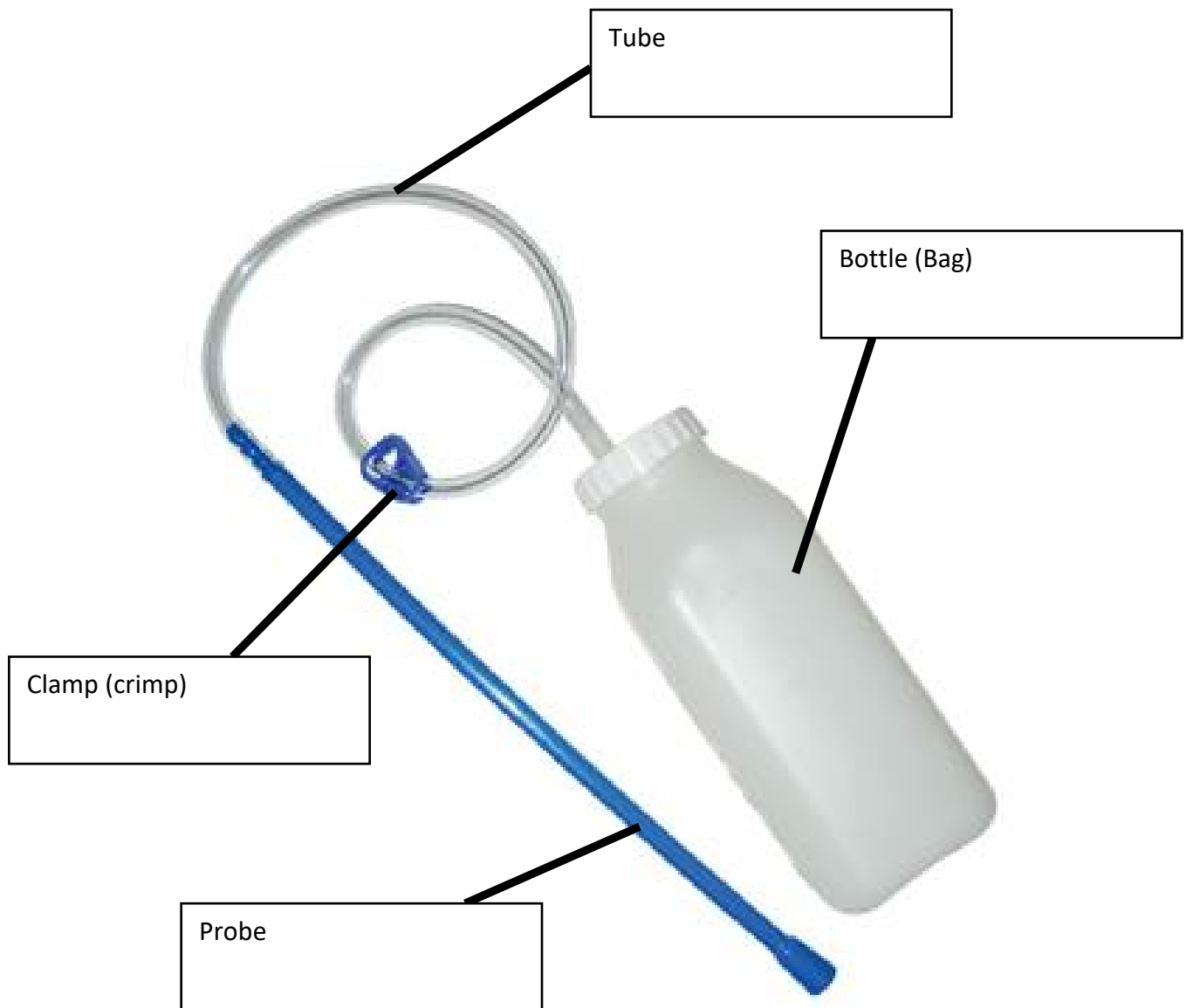
Esophageal Feeder Components



Esophageal Feeder Components – Answer Key

This image is a different style of esophageal feeder from what is provided with the simulator.

This is to allow participants an opportunity to see a variety of feeder styles.



Lesson Two – Esophageal Feeding

REVIEW: Esophageal Feeding Demonstration & Exit Ticket

15 minutes

Purpose:

Participants will demonstrate how to feed a calf using the esophageal feeding method.

Materials:

- Whiteboard, blackboard, or LCD projector
- Calf Simulator
- Esophageal feeder (included with simulator)
- *Esophageal Feeding* slide presentation
- *Esophageal Procedure Demonstration Checklist*
- *Esophageal Feeding Exit Ticket*

Facilitation Steps:

1. **Slide 13:** For the demonstration, have a copy of the checklist for each participant. Have participants come up to the calf simulator one at a time and ask them to demonstrate how to feed a calf using the esophageal feeding technique. Use the *Esophageal Procedure Demonstration Checklist* to confirm participants' mastery of the material.
2. **Slide 14:** At the conclusion of the lesson, have participants complete the *Esophageal Feeding Exit Ticket* to be turned in prior to leaving class for the day. The exit ticket shall include the following items:
 - a. 3 things I learned today
 - b. 2 things I found interesting
 - c. 1 question I still have
3. Review the exit tickets at the conclusion of class to determine what may need to be clarified for participants at the beginning of the next class period.

Name: _____ Class: _____

Esophageal Feeder Demonstration Checklist

Esophageal Feeder Demonstration Checklist	
Prepare the feeder	☐ Fill the bottle or bag with fluid ☐ Clamp or crimp the tube (may have to hold bag upside down to prevent flow of fluid) Comments:
Prepare calf	☐ Restrain the animal (back into corner, or brace against a wall or panel) ☐ Face same direction as calf and place its head between your legs Comments:
Begin insertion	☐ Moisten the tip of the probe and tube ☐ Open calf's mouth using a finger in the corner of its mouth to pry open ☐ Gently insert the tip of the tube or probe into the calf's mouth on top of tongue ☐ Slide tube or probe to far left of calf's mouth towards esophagus Comments:
Administer fluid	☐ Do not raise the bottle or bag above the animal's head ☐ Allow the animal to start swallowing and continue sliding the tube into the esophagus ☐ Administer fluid Comments:
Post-feeding	☐ After fluid is administered, clamp or crimp the tube before removing it slowly ☐ Properly clean and disinfect the equipment when finished Comments:

Name: _____ Class: _____

Esophageal Feeding Exit Ticket

3 things you learned:

1.

2.

3.

2 things you found interesting:

1.

2.

1 question you still have:

1.

Sources

1. Dr. Lynae Schott, DVM; Sauk Prairie Veterinary Clinic
2. <https://afs.ca.uky.edu/dairy/esophageal-feeder-life-saving-tool-calves>
3. <http://veterinaryextension.colostate.edu/menu2/Cattle/TubeDoc.pdf>
4. https://animart.com/files/TubingACalf_PRINTED.pdf
5. InfoVets.com online beef manual (Animal Health Publications)
6. InfoVets.com online dairy manual (Animal Health Publications)

Lesson Three – Castration & Navel Care

Lesson Overview

When a calf is born, there are certain calf care management procedures to be conducted to ensure your animals are healthy. This lesson will teach participants how to castrate calves as well as how to assess swollen navels.

Lesson Objectives

After completing this lesson, participants will be able to:

- Name two potential causes of swollen navels
- Describe how to properly prevent swollen navels on calves
- Identify the proper method of castration based on age
- Demonstrate how to castrate a calf at various age levels

Lesson at a Glance

Activity	Materials	Preparation	Approximate class time
FOCUS	• Whiteboard, blackboard, or LCD projector • <i>Castration & Navel Care</i> slide presentation	1. Prepare <i>Castration & Navel Care</i> slide presentation for viewing	15 minutes
LEARN	• Whiteboard, blackboard, or LCD projector • Calf Simulator • Elstrator (if available) • Newberry knife (if available) • Callicrate bander (if available) • <i>Castration & Navel Care</i> slide presentation • <i>Castration Notes</i> worksheet • <i>Navel Care Notes</i> worksheet	1. Print/photocopy <i>Castration Notes</i> and <i>Navel Care Notes</i> worksheets (one per participant) 2. Prepare <i>Castration & Navel Care</i> slide presentation for viewing	30 minutes
REVIEW	• <i>Castration & Navel Care Exit Quiz</i> • <i>Castration Demonstration Checklist</i> (may be incorporated during the lesson)	2. Print/photocopy <i>Castration & Navel Care Exit Quiz</i> and <i>Castration Demonstration Checklist</i> (one per participant)	15 minutes

Lesson Three – Castration & Navel Care

FOCUS: To Call or Not to Call

15 minutes

Purpose:

Participants will determine the best course of action based on budgetary constraints.

Materials:

- Whiteboard, blackboard, or LCD projector
- *Castration & Navel Care* slide presentation

Facilitation Steps:

1. **Slide 2:** Review the following scenario:
“You are a beef producer who has a moderate cow or calf operation. Knowing that you raise cows and calves, you understand that you may need to rely on your local veterinarian for assistance from time to time. What are some of the reasons you might call the veterinarian?”
2. Allow for a discussion amongst the class for five minutes. Topics could include sick animals, routine procedures like blood work or injections, dehorning, administering medications, health checks, etc.
3. After the class discussion, talk to the class about how an important part of any business is to minimize expenses in order to maximize profits. Animal production is no different. Explain to the class that today, we are going to be talking about how to castrate animals and how to give injections in tail veins as a way of minimizing the need to call a veterinarian to assist us.

Lesson Three – Castration & Navel Care

LEARN: Castration & Navel Care

30 minutes

Purpose:

Participants will learn how to castrate calves and the purpose behind this procedure, along with how to utilize the tail vein for injections and blood draws.

Materials:

- Whiteboard, blackboard, or LCD projector
- Calf Simulator
- Elastrator (if available)
- Newberry knife (if available)
- Callicrate bander (if available)
- *Castration & Navel Care* slide presentation
- *Castration Notes* worksheet
- *Navel Care Notes* worksheet

Facilitation Steps:

Note: you may have to provide additional instruction on reproductive anatomy of male animals prior to the lesson if participants are not familiar with the terms used in this lesson.

1. Explain that there are certain procedures that a producer can conduct on their own to prevent them from having to hire a veterinarian. Two of these procedures are navel dipping (swollen navels) and castration.
2. **Slide 4:** First, let's look at castration. According to the American Veterinary Medical Association (AVMA) there are three major groups of castration methods: physical, chemical, and hormonal.
3. Regardless of which group of castration you are considering, you will be either physically removing the testicles, damaging them to a point that the body can't fix it, or causing atrophy.
4. **Slide 5:** What is the purpose of castration? Explain the benefits of castration, which include:
 - a. Decreased aggression
 - b. Decreased sexual activity
 - c. Decreases number of animals with high muscle pH
 - d. Meat quality tends to be higher, more tender, and more consistent, with increased marbling
 - e. Castrated bulls yield a higher price at market compared to intact bulls
5. At what age should I castrate the animal? There are different preferences. (*The discussion of when to castrate an animal could be a class debate as an additional lesson.*)
 - a. **Slide 6:** Less than 3 months of age – Some recommendations say it is best to castrate a calf when they are less than 3 months of age because it is a low stress period in a calf's life. Typically, producers want to wait until after the first 24 hours of life to ensure that the animal has received all of its antibodies. For animals at this age, an elastrator is an appropriate tool (*if you have an elastrator, you can show the class how this works*). For the elastrator, you will put an elastrator band on the tool and expand the tool so that the band is stretched open. With one hand, you will want to locate both testicles in the scrotum and then move them to the bottom of the scrotum. If you cannot find both testicles, you may have to get the animal to relax their legs or consider surgical removal. Using the tool with the prongs towards the body (otherwise you won't be able to remove the tool), insert the testicles inside of the stretched-out band and position the band as close to the body as possible. It is important to ensure that both testicles are completely outside of the elastrator and only around the spermatic cord.
 - b. **Slide 7:** 3-10 months – At this point in a calf's life, the testicles can sometimes be too large for an elastrator. For this age,

other tools may be necessary. Common tools used are a Newberry knife, or any sterilized knife if a Newberry knife is not available. With either knife, you will be cutting open the scrotum for the testicles to drop out. With the Newberry knife, you will clamp the scrotum in the knife and pull down to cut open the scrotum. With a standard knife, you will pinch the scrotum with one hand and cut off the bottom third of the scrotum to open it. Once the scrotum is open, you force the testicles out of the scrotum one at a time by pulling them out, slowly and gently. While holding the testicle and spermatic cord, you will continue to pull, trying to separate the testicle from the cremaster muscle. You may have to use your other hand to help strip away tissues from the testicle. If the testicle does not separate, you may have to use your knife to scrape the tissues in a peeling fashion. Avoid cutting the spermatic cord directly as this could result in excessive bleeding. If the testicle won't release, a tool called an emasculator may be used. This tool is placed around the spermatic cord and clamped down, held in place for up to 10-15 seconds and released. This action crushes and cuts the spermatic cord.

Castration with a knife can be done earlier than 3 months.

- c. **Slide 8:** 10+ months – At this point in a calf's life, it might be best to use a Callicrate bander. This is a specialized tool that works in a similar fashion to an elastrator. The big difference is that it allows for you to apply it to a larger scrotum. Then, instead of just releasing the tool, you will have to ratchet the device to tighten the band around the scrotum and apply a clamp to the band once it is tight.
6. **Slide 9:** Wound Treatment – After the castration is complete, it is best to apply iodine to the scrotum area and release the calf into a clean and dry bedding area that is not too crowded. With fewer animals around, the

stress level of the animal will decrease and in turn will slow down blood flow towards the scrotum. If a calf is still nursing, it may be released back to its mother. Monitor for excessive amounts of flies as this can cause infections.

7. **Slide 10:** The second half of this lesson focuses on navel care of a newborn calf. When calves are born, we cannot always guarantee the cleanliness of their pen at the time of birth, or the location in a pasture they are born. With this, we may have to monitor the animal's navel for concerns that might arise. The biggest concern with the navel is if it is swollen. Participants can take notes on the "Navel Care Worksheet."
8. **Slide 11:** A swollen navel can be a result of a hernia, with loops of intestine or a localized abscess inside the swollen area. When monitoring your calves, you can palpate the navel area to determine if there is swelling or not. If the navel is firm and hard, this is an indication there is something wrong. The best course of action would be to contact your local veterinarian in the case of a swollen navel.
9. **Slide 12:** Use the Calf Simulator to inflate the navel to make it "swollen" and have participants palpate the animal to know what they should feel.
10. **Slide 13:** Explain to participants that this can be prevented by conducting a navel dip when calves are born. For this, follow the following procedures:
 - a. Immediately after birth, administer Povidone iodine (Betadine: 7% tincture) by placing it in some type of container that an umbilical cord can be submerged in.
 - b. Replace the iodine after 4-5 uses.
 - c. If no container is available, a spray bottle is an acceptable replacement by spraying the iodine on the navel cord.
 - d. When submerging the umbilical cord, make sure that it is fully submerged, along with the opening into the abdomen.
 - e. Repeat this procedure daily until the umbilical cord falls off.

Name: _____ Class: _____

Castration Notes

1. Define male castration:
2. Three major castration groups:
 - a.
 - b.
 - c.
3. Benefits of castration:
 - a. _____ aggression
 - b. Decreased sexual activity
 - c. Decreases number of animals with _____
 - d. Meat quality tends to be higher _____, more consistent, increased _____, and more _____
 - e. Yield a _____ at market compared to intact bulls
4. When to castrate?
 - a. Less than ____ months of age
 - i. Low _____ time
 - ii. Wait for ____ hours after birth
 - iii. Use an _____
 1. Load _____ on tool
 2. Feel for both testicles on animal; locate to bottom of _____
 3. With prongs towards body, insert _____ inside stretched band; position band _____ to body
 - b. ____ - ____ months of age
 - i. Testicles _____ for elastrator
 - ii. Use a _____ knife or sterilized knife
 1. _____ knife: clamp scrotum in knife and pull _____ to cut open scrotum

2. Standard knife: pinch scrotum and cut off bottom ___ or ___ of scrotum
 3. Force testicles out _____ pulling slowly and gently separating testicle from cremaster muscle
 4. Avoid _____ cutting
 5. May need to use _____ tool.
- c. _____ months +
- i. Use _____ bander
 1. Specialized tool similar to _____
 2. Difference between this and elastrator is it allows for you to apply to a _____ scrotum
 3. _____ versus releasing a band
 4. Tightens a band around a scrotum and apply a _____ once tight.
5. Wound treatment
- a. After castration, apply _____
 - b. Release calf to _____ bedding
 - c. Minimize stress by trying to _____
 - d. May be released back with mother if nursing
 - e. Monitor for excessive amounts of _____

Castration Notes – Answer Key

1. Define castration: **Removal of testicles from a male animal**
2. Three major castration groups
 - a. **Physical**
 - b. **Chemical**
 - c. **Hormonal**
3. Benefits of castration
 - a. **Decreased** aggression
 - b. Decreased sexual activity
 - c. Decreases number of animals with **high muscle pH**
 - d. Meat quality tends to be higher **quality grade**, more consistent, increased **marbling**, and more **tender**
 - e. Yields a **higher price** at market compared to intact bulls
4. When to castrate?
 - a. Less than **3** months of age
 - i. Low **stress** time
 - ii. Wait for **24** hours after birth
 - iii. Use an **elastrator**
 1. Load **band** on tool
 2. Feel for both testicles on animal; locate to bottom of **scrotum**
 3. With prongs towards body, insert **testicles** inside stretched band; position band **close** to body
 - b. **3-10** months of age
 - i. Testicles **too large** for elastrator
 - ii. Use a **Newberry** knife or sterilized knife
 1. **Newberry** knife: clamp scrotum in knife and pull **down** to cut open scrotum
 2. Standard knife: pinch scrotum and cut off bottom **1/3** of scrotum
 3. Force testicles out **one at a time** pulling slowly and gently separating testicle from cremaster muscle
 4. Avoid **blunt** cutting
 5. May need to use **emasculator** tool.
 - c. **10** months +
 - i. Use **Callicrate** bander
 1. Specialized tool similar to **elastrator**
 2. Difference between this and elastrator is it allows for you to apply to a **larger** scrotum
 3. **Ratcheting** versus releasing a band
 4. Tightens a band around a scrotum and apply a **clamp** once tight.
5. Wound treatment
 - a. After castration, apply **iodine**
 - b. Release calf to **clean dry** bedding
 - c. Minimize stress by trying to **isolate**
 - d. May be release back with mother if nursing
 - e. Monitor for excessive amounts of **flies**

Name: _____ Class: _____

Navel Care

1. Causes of a swollen navel:

-
-

2. A swollen navel will feel _____ and _____

3. To prevent navel swelling one should conduct a _____

4. Navel dip procedure:

- Immediately after birth, administer _____ by placing it in some type of container that an umbilical cord can be submerged in
- Replace iodine after ____ - ____ uses
- If no container is available, a _____ is acceptable to use by spraying the iodine on the navel cord
- When submerging the umbilical cord, make sure it is _____ as well as the opening into the _____
- Repeat this procedure _____ until the umbilical cord _____

Navel Care – Answer Key

1. Causes of a swollen navel:
 - **Hernia with loops of intestine in the swelling**
 - **Localized abscess**
2. A swollen navel will feel **firm and hard**
3. To prevent navel swelling one should conduct a **navel dip**
4. Navel dip procedure:
 - Immediately after birth administer **povidone iodine** by placing it in some type of container that an umbilical cord can be submerged in
 - Replace iodine after **4-5** uses
 - If no container is available, a **spray bottle** is acceptable to use by spraying the iodine on the navel cord
 - When submerging the umbilical cord, make sure it is **fully submerged** as well as the opening into the abdomen
 - Repeat this procedure **daily** until the umbilical cord **falls off**

Lesson Three – Castration & Navel Care Exit Quiz

REVIEW: Castration & Navel Care Exit Quiz

15 minutes

Purpose:

Participants will demonstrate how to feed a calf using the esophageal feeding method.

Materials:

- *Castration Demonstration Checklist*
- *Castration & Navel Care Exit Quiz*

Facilitation Steps:

1. For the demonstration, have a copy of the checklist for each participant. Have participants come up to the calf simulator one at a time and ask them to demonstrate how to castrate a calf at a certain age level. You can have all participants demonstrate all three age categories or give each participant one of the three. Use the *Castration Demonstration Checklist* to confirm participant's mastery of the material.
2. At the conclusion of the lesson, hand out copies of the *Castration & Navel Care Exit Quiz* (can easily be a FOCUS activity the following class period). Have participants complete the exit quiz to be turned in prior to leaving class for the day.
3. Review the exit quizzes at the conclusion of class to determine what may need to be clarified for participants at the beginning of the next class period.

Castration Demonstration Checklist

Teacher Guide

Introduction: This assessment should be completed in the Navel Care and Castration Lesson, during the Review portion.

Materials needed: Elastrator and/or Newberry (or standard) knife and/or Callicrate bander, Realityworks Calf Simulator

Steps for using the Castration Demonstration Checklist:

Step 1: Have participants come up individually to demonstrate how to properly castrate a calf.

Step 2: When each participant comes to the simulator, they will need to successfully demonstrate the steps to castrating a calf. Depending on the tools available, a participant may need to demonstrate the different castration techniques based on age; if only one type of tool is available, demonstrate that specific method. If all tools are available, participants could be randomly assigned an age of calf to castrate. In this situation, the participant would need to select the best method to use and demonstrate to the instructor.

Step 3: As a participant demonstrates, check off the step being completed making note of any additions or corrections that should be considered when completing the step in the future.

Name: _____ Class: _____

Castration Demonstration Checklist

Castration Demonstration Checklist – Under 3 Months (Elastrator)	
Load band	☐ Place elastrator band on the tool ☐ Expand the tool so the band is stretched open Comments:
Locate testicles	☐ With one hand, find both testicles in the scrotum (if both can't be found, get animal to relax their legs and try again) ☐ Move the testicles to bottom of scrotum Comments:
Apply Band	☐ With prongs towards the body, insert the testicles inside of the stretched-out band ☐ Position the band as close to the body as possible, ensuring that both testicles are completely outside the elastrator and only around the spermatic cord Comments:
3-10 Months (Newberry or Standard Knife)	
Make cut	☐ Newberry knife: clamp scrotum in the knife and pull down to cut open the scrotum ☐ Standard knife: pinch scrotum with one hand and cut off bottom 1/3 of scrotum to open it Comments:

Remove Testicles	☐ Slowly pull testicles out one at a time and gently ☐ While holding the testicles and spermatic cord, continue pulling to separate the testicle from cremaster muscle (you may have to use other hand to strip tissue away from testicle) Comments:
Emasculator (If necessary)	☐ If the testicle won't release, place the emasculator around the spermatic cord and clamp down ☐ Hold it in place 10-15 seconds and release Comments:
10+ Months (Callicrate Bander)	
Load band	☐ Load band onto Callicrate bander ☐ Hold the band open Comments:
Locate testicles	☐ With one hand, find both testicles in the scrotum (if both can't be found, get animal to relax their legs and try again) ☐ Locate testicles to bottom of scrotum Comments:
Apply band	☐ Place the band above the testicles ☐ Begin ratcheting the band tight ☐ Once tight ensure the band is secure and remove from the bander Comments:

Name: _____ Class: _____

Castration & Navel Care Exit Quiz

Multiple Choice

1. At what age would a Callicrate bander be used:
 - a. Less than 3 Months
 - b. 3-10 Months
 - c. 10 months +
2. At what age would you use an elastrator:
 - a. Less than 3 Months
 - b. 3-10 Months
 - c. 10 months +
3. At what age would you use a Newberry knife:
 - a. Less than 3 Months
 - b. 3-10 Months
 - c. 10+ months
4. A swollen navel can be the result of:
 - a. A localized abscess
 - b. A hernia with loops of intestines
 - c. Both A & B

Short Answer:

5. What are the three major castration groups according to the American Veterinary Medical Association?
 - a.
 - b.
 - c.
6. What are two reasons discussed in class why someone would have their animals castrated?
 - a.
 - b.

Castration & Navel Care Exit Quiz – Answer Key

Multiple Choice

1. At what age would a Callicrate bander be used:
a. Less than 3 Months b. 3-10 Months
c. **10 months +**
2. At what age would you use an elastrator:
a. **Less than 3 Months** b. 3-10 Months
c. 10 months +
3. At what age would you use a Newberry knife:
a. Less than 3 Months b. **3-10 Months**
c. 10+ months
4. A swollen navel can be the result of:
a. A localized abscess b. A hernia with loops of intestines
c. **Both A & B**

Short Answer:

5. What are the three major castration groups according to the American Veterinary Medical Association?
a. **Physical**
b. **Chemical**
c. **Hormonal**
6. What are two reasons discussed in class why someone would have their animals castrated?

Answers can include any two of the following

- a. **Decreased aggression**
- b. **Decreased sexual activity**
- c. **Decreases number of animals with high muscle pH**
- d. **Meat quality tends to be higher quality grade, more consistent, increased marbling, and more tender**
- e. **Yields a higher price at market compared to intact bulls**

Lesson Four – Tail Vein Injections & Blood Draws

Lesson Overview

When cattle get older, there are multiple options for treating animals. It is up to a producer and/or veterinarian to know the best route of administration for a given set of circumstances. This lesson will allow participants to learn and demonstrate an alternative location for injection used for specific purposes.

Lesson Objectives

After completing this lesson, participants will be able to:

- Name three different reasons a producer and/or veterinarian might use the tail vein
- Describe how to properly conduct a blood draw
- Identify the location for conducting tail vein injections or draws
- Demonstrate how to do a blood draw or injection using a tail vein

Lesson at a Glance

Activity	Materials	Preparation	Approximate class time
FOCUS	• Whiteboard, blackboard, or LCD projector • <i>Tail Vein Injections & Blood Draws slide presentation</i> • <i>Sample syringes</i> • <i>Sample needle sizes</i>	1. Prepare <i>Tail Vein Injections & Blood Draws slide presentation</i> for viewing	10 minutes
LEARN	• Whiteboard, blackboard, or LCD projector • <i>Tail Vein Injections & Blood Draws Checklist slide presentation</i> • Calf Simulator • <i>Tail Vein Injections & Blood Draws Worksheet</i>	1. Print/photocopy <i>Tail Vein Injections & Blood Draws</i> (one per participant) 2. Prepare <i>Tail Vein Injections & Blood Draws slide presentation</i> for viewing	30 minutes
REVIEW	• <i>Tail Vein Blood Draws Checklist</i>	3. Print/photocopy <i>Tail Vein Injections & Blood Draws Checklist</i> (one per participant)	20 minutes

Lesson Four – Tail Vein Injections & Blood Draws

FOCUS: Basics of a Syringe

10 minutes

Purpose:

Participants will identify the components of a needle and syringe.

Materials:

- Whiteboard, blackboard, or LCD projector
- *Tail Vein Injections and Blood Draws* slide presentation
- Sample syringes
- Sample needle sizes

Facilitation Steps:

1. Using the slide presentation titled *Tail Vein Injections and Blood Draws*, have **slide 2** pulled up on your board with the picture of a syringe. Ask participants to think for a minute if they can identify all parts of the syringe.
2. After giving the participants a minute to think about their answers, review the parts of the syringe using **slide 3** of the slide presentation titled *Tail Vein Injections and Blood Draws*.
 - a. Barrel – vessel that holds medication
 - b. Plunger – pushes through the barrel to dispense liquid
 - c. Piston – rubber fitting on the plunger to ensure all liquid is removed
 - d. Tip – end of the barrel where the needle attaches to
 - e. Hub – part of the needle that attaches to the syringe tip
 - f. Bevel – a slanted opening on the tip of a needle
 - g. Shaft – long part of the needle
 - h. Needle cap – a cap that protects needle and handler
3. Using **slide 4** of the slide presentation titled *Tail Vein Injections and Blood Draws*, review the needle gauge sizes and identify what animals they would be used on.
 - a. Needles are measured in gauges (the inside diameter of a needle).
 - b. The smaller the gauge number, the larger the diameter of the inside of the needle shaft.
 - c. The larger the gauge number, the smaller the diameter of the inside of the needle shaft.
 - d. Gauges 19 on down are typically used on larger livestock species.
 - e. Gauges 20 on up are typically used on smaller or companion animals.

Lesson Four – Tail Vein Injections & Blood Draws

LEARN: Tail Vein Injections & Blood Draws

30 minutes

Purpose:

Participants will learn how to conduct blood draws and injections using the tail vein on cattle.

Materials:

- Whiteboard, blackboard, or LCD projector
- Calf Simulator
- Needles and syringes
- Simulated medicine bottle
- *Tail Vein Injections and Blood Draws slide presentation*
- *Tail Vein Injections Worksheet*
- *Navel Care Worksheet*

Facilitation Steps:

Please note you may want to explain to the class that while this lesson is focused on giving injections in the tail vein and doing blood draws, one typically wouldn't be doing these procedures on a calf.

Incorporating this into the calf simulator gives participants an understanding of this concept without having a full-sized animal model.

1. **Slide 6:** Review Lesson Purpose & Objectives.
2. Begin this portion of the lesson by explaining that there are several scenarios a producer or veterinarian must consider when working with animals on a farm and treating them. Most often, they will consider what will yield the best result and have the least possible amount of negative impact on the animal.
3. Explain that the two procedures we are looking at today are injections and blood draws using a tail vein.
4. **Slide 8:** First, let's look at injections. When looking to use a tail vein for an injection, one should ask why it needs to be done. The biggest reason for this type of injection as it is going to be easiest for one person to restrain the animal and give the injection by themselves. More often than not, injecting into the tail vein is a convenience issue compared to anything else.
5. **Slide 10:** There are various types of injections that can be administered through the tail vein. These can include oxytocin (for milk let down) or tranquilizing medication.
6. **Slide 11:** Another procedure you can use the tail vein for is conducting blood draws. Blood work can be drawn for various reasons: pregnancy tests (not always accurate), checking for calcium or blood panel for sick cows, brucellosis, and ketosis.
7. **Slide 12:** To conduct a blood draw on cattle, you need to do the following:
 - a. First, make sure to restrain the animal. With the animal in a chute or headlock, you can use the tail method. To do this, simply lift up the tail so it is fully upright. This helped to immobilize the animals.
 - b. Find the correct location by finding the third and fourth coccygeal vertebrae from the base of the tail.
 - c. You will notice a valley near the base of the tail where you can find the tail vein. This vein runs on the midline of the tail.
 - d. Once you have found the location, you will want to wipe the underside

- of the tail with an alcohol solution to maintain sanitation protocols.
- e. At this point, you can begin to insert the needle bevel up. If you hit a bone, simply back the needle out slightly. Typically, when doing blood draws, you won't use the larger needles like you would on the other parts of cattle. Typically, you would use an 18-20-gauge needle in the tail vein.
 - f. If you successfully find the vein, aspirate the syringe until it fills up with blood.
 - g. Collect the necessary amount based on the blood test you are conducting. For example, if testing for Ketosis, you only need a couple of drops of blood.
 - h. You may need to apply pressure when done if the tail is still bleeding.
 - i. Blood samples should be immediately tested or put in appropriate blood tubes to be tested in a lab.
 - j. If giving injections, you will follow the same procedures. You will want to allow blood in the needle with your medicine. This will ensure that you hit the vein and the blood mixes with the medicine ensuring that you use all of it. At this point, you would push the blood and medicine mixture back into the vein.
8. At this point, you can move on to the REVIEW portion of the lesson, where participants can come up to demonstrate how to do a blood draw on an animal using the calf simulator.

Name: _____ Class: _____

Tail Vein Injections & Blood Draws Notes

1. Parts of a syringe

- a. _____: holds medication
- b. _____: pushes through barrel to dispense liquid
- c. _____: rubber fitting on the plunger to ensure all liquid is removed
- d. _____: end of barrel where the needle attaches
- e. _____: attaches to syringe tip
- f. _____: slanted opening on the tip of a needle
- g. _____: long part of the needle
- h. _____: cap that protects needle and handler

2. Needle gauges:

- a. Needles are measured in _____
- b. Smaller number = _____ diameter of needle
- c. Larger number = _____ diameter of needle
 - i. Gauges < _____ typically larger _____
 - ii. Gauges > _____ typically smaller or _____

3. Why inject in the tail vein?

- a. Ability of a producer/veterinarian to _____ and _____ by _____

4. What is injected in the tail vein?

- a. Examples include:
 - i. _____: used for _____ let down
 - ii. _____ medication: used for surgical procedures

5. Why get blood draws from tail veins

- a. _____ tests
- b. Check _____ or blood panels for sick cows
- c. Test for _____
- d. Test for _____

6. Tail vein blood draw procedures

Step 1: _____ the animal using _____ method

Step 2: Locate _____ and _____ coccygeal vertebrae

Step 3: Locate the _____ near the base of tail

Step 4: Wipe _____ of tail with _____ solution

Step 5: _____ between 3rd and 4th coccygeal vertebrae

Step 6: Aspirate syringe to fill with _____

Step 7: Collect necessary _____ of _____ for the test you're conducting

Step 8: Apply _____ to stop bleeding (if necessary)

Step 9: Test blood samples _____ or put samples in blood tubes

Tail Vein Injections and Blood Draws – Answer Key

1. Parts of a syringe
 - a. **Barrel**: holds medication
 - b. **Plunger**: pushes through barrel to dispense liquid
 - c. **Piston**: rubber fitting on the plunger to ensure all liquid is removed
 - d. **Tip**: end of barrel where the needle attaches
 - e. **Hub**: attaches to syringe tip
 - f. **Bevel**: slanted opening on the tip of a needle
 - g. **Shaft**: long part of the needle
 - h. **Needle cap**: cap that protects needle and handler
2. Needle gauges
 - a. Needles are measured in **gauges**
 - b. Smaller number = **larger** diameter of needle
 - c. Larger number = **smaller** diameter of needle
 - i. Gauges < **19** typically larger **livestock**
 - ii. Gauges > **19** typically smaller or **companion animals**
3. Why inject in the tail vein?
 - a. Ability of a producer/veterinarian to **restrain** and **inject** by **themselves**
4. What is injected in the tail vein?
 - a. Examples include:
 - i. **Oxytocin**: used for **milk** let down
 - ii. **Tranquilizing** medication: used for surgical procedures
5. Why get blood draws from tail veins
 - a. **Pregnancy** tests
 - b. Check **calcium** or blood panels for sick cows
 - c. Test for **brucellosis**
 - d. Test for **ketosis**
6. Tail vein blood draw procedures
 - Step 1: **Restrain** the animal using **“tailing”** method
 - Step 2: Locate **3rd** and **4th** coccygeal vertebrae
 - Step 3: Locate the **“valley”** near the base of tail
 - Step 4: Wipe **underside** of tail with **alcohol** solution
 - Step 5: **Insert needle** between 3rd and 4th coccygeal vertebrae
 - Step 6: Aspirate syringe to fill with **blood**
 - Step 7: Collect necessary **amount** of **blood** for the test you’re conducting
 - Step 8: Apply **pressure** to stop bleeding (if necessary)
 - Step 9: Test blood samples **immediately** or put samples in blood tubes

Lesson Four – Tail Vein Injections & Blood Draws

REVIEW: Tail Vein Blood Draw Demonstration

20 minutes

Purpose:

Participants will demonstrate how to conduct a tail vein blood draw.

Materials:

- *Tail Vein Blood Draws Demonstration Checklist*
- Calf Simulator

Facilitation Steps:

1. For the demonstration, have a copy of the *Tail Vein Blood Draws* checklist for each participant. Have participants come up to the calf simulator one at a time and ask them to demonstrate how to draw blood using the tail vein. Use the *Tail Vein Blood Draws Checklist* to confirm participants' mastery of the material.
2. Review the checklists at the conclusion of class to determine what may need to be clarified for participants at the beginning of the next class period.

Name: _____ Class: _____

Tail Vein Blood Draw Demonstration Checklist

Tail Vein Blood Draws Demonstration Checklist	
Prepare the animal	☐ Restrain the animal (using “tailing” method) ☐ Locate 3 rd and 4 th coccygeal vertebrae ☐ Locate the “valley” near the base of tail ☐ Wipe the underside of the tail with alcohol solution Comments:
Collect Blood	☐ Insert needle between 3 rd and 4 th coccygeal vertebrae ☐ Aspirate syringe to fill with blood ☐ Collect the necessary amount of blood for the test being conducted Comments:
Post-blood collection	☐ Apply pressure to stop bleeding (if necessary) ☐ Test the blood sample immediately or put the samples in blood tubes Comments:

*For variation, each participant could be given different scenario cards containing different tests to conduct, different amount of bleeding after the removal of the syringe, etc. Participants would then need to perform the blood draw based on the assigned scenario.

Sources

1. Dr. Lynae Schott, DVM; Sauk Prairie Veterinary Clinic
2. https://ouv.vt.edu/content/dam/ouv_vt_edu/sops/large-animal/sop-bovine-blood-collection.pdf