CHORE PLANS
Introduction

This Chore Plan notebook contains detailed, step-by-step instructions for many tasks involved in calf care. Locate tasks using the tabs labeled with section titles. Within each section, the first page outlines all the tasks described in that section. Procedures described are best management practices; however, in some cases recommendations are generalized. Consult your veterinarian or other dairy professionals to tailor these programs to your specific situation. We recommend personalizing as many steps as possible to improve employee understanding of your farm’s procedures.

Supporting information compiled from research and extension publications may be found in the Calf Track Trainer’s Guide. The seven sections of Chore Plans correspond to the seven chapters of the Trainer’s Guide.

The Calf Track program materials have been developed under the leadership of Dr. Jud Heinrichs of the Dairy and Animal Science Department at the Pennsylvania State University.

Components of the program were prepared, reviewed, and edited by various faculty and staff of the Departments of Dairy and Animal Science and Veterinary Science at Penn State.

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NEWBORN CALF MANAGEMENT:

INTRODUCTION: Newborn calf management is an important part of the dairy operation that influences calf morbidity and mortality rates. Attention to the cow and calf at freshening time is one of the most economically important tasks on the dairy farm. Calves born and started successfully will be valuable milking animals in 22 to 24 months. Dairy calves are born daily, and a calf raiser needs to skillfully care for newborns.

The management of newborn calves includes these chores:

A. Close-up Cow Care
B. Individual Maternity Pen Maintenance
C. Group Maternity Pen Maintenance
D. Calving Process and Observation

**CALVING ACTION PLAN**
E. Calving Problems and Assistance
F. Navel Cord Dipping
G. Identification and Tagging
H. Weighing and Measuring

CHORE OUTCOMES:

<table>
<thead>
<tr>
<th>IF YOU DO</th>
<th>IF YOU DON’T</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1A. Close-up cow care</strong></td>
<td></td>
</tr>
<tr>
<td>- Close-up cows managed as separate group.</td>
<td>- Close-up cows managed the same as far-off dry cows.</td>
</tr>
<tr>
<td>- Cows prepared for lactation by feeding transition ration.</td>
<td>- Reduced milk production and/or dry matter intake.</td>
</tr>
<tr>
<td>- Improved observation of individual cows.</td>
<td>- Missed vaccinations, health problems, or signs of calving.</td>
</tr>
<tr>
<td>- Reduced crowding and stress.</td>
<td>- Cows stressed by crowding or riding.</td>
</tr>
</tbody>
</table>

| **1B and 1C. Maternity pen maintenance** | | |
| - Clean, healthy environment. | - Dirty, dangerous environment. |
| - Reduced disease risk and stress for calf and cow. | - Increased disease risk and stress for calf and cow. |
| - Higher calf survival rate. | - Lower calf survival rate. |
| - Easier to observe and assist birth. | - Harder to observe and assist birth. |

| **1D. Calving process and observation** | | |
| - Identify problems early. | - Unidentified problems. |
| - Healthy, strong calves. | - Weak or dead calves. |
| - Healthy, productive cows. | - Injured or sick cows. |

Calving Action Plan is included as an example flow diagram showing the steps of the calving process and assisted calving.
### 1E. Calving problems and assistance
- Assist only when needed.
- Healthy newborn calves.
- Healthy cows.
- Assist too early or too late.
- Weak or dead calves.
- Injured cows.

### 1F. Navel cord dipping
- Reduced chance of infection, illness, and death.
- Navel cord washed, disinfected, and dried.
- Increased risk of infection, illness, and death.
- Wet, dirty navel cord attracts bacteria and flies.

### 1G. Identification and tagging
- Identified calf with recorded genetic information.
- Unidentified calf with unknown genetic heritage.

### 1H. Weighing and measuring
- Recorded birth weights used to determine correct feeding amounts and to monitor growth.
- Growth records used to monitor and adjust feeding practices.
- Unrecorded birth weights mean feeding amounts must be estimated and growth progress is unknown.
- No records available to monitor or evaluate feeding practices.

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**Questions? Please see the herd manager.**

*Thank you, and keep up the good work!*
Close-up Cow Care

Skills Needed: Cow handling and ability to identify calving signs.

Equipment Needed: Separate housing and feeding area for close-up group and expected calving dates.

Time Required: Periodic checking and daily feeding.

WHY?  A separate close-up group allows the prefresh cow to prepare for lactation and adjust to a new ration. Careful management during this time can increase milk production and ensure healthy calves and cows.

HOW?

Step 1. Review cow records to determine expected freshening dates.

Step 2. Two to three weeks before their due date, move cows from dry cow group to close-up group.

Step 3. Feed a transition ration to prepare cows for the lactating ration.

Step 4. Give pre-calving injections or vaccinations following veterinarian's recommendations.

Step 5. Observe and monitor close-up cows regularly (about every 2 hours) for calving signs.

Step 6. Signs of freshening:

- Swollen vulva
- Appetite loss
- Clear mucus discharge
- Sunken tailhead area
- Cow removes herself from group
- Restlessness

Step 7. At signs of calving, calmly move cow to a clean maternity pen (Chore Plan 1B or 1C) and monitor progress. Review Chore Plan 1D.

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Individual Maternity Pen Maintenance

Skills Needed: Attention to detail.

Equipment Needed: 12 x 12 foot maternity pen, manure-handling equipment, shovel, fork, broom, detergent, disinfectant, hydrated lime, bedding material.

Time Required: 20 minutes per pen plus drying time.

WHY? Most calves begin their lives in the maternity pen. It must be a clean, disinfected environment to minimize stress and risk of infection.

HOW?

Step 1. Maternity pens should be at least 12 x 12 feet and have an appropriate floor surface that is sloped for drainage of water and urine.

Step 2. Clean pens after every calving.

Step 3. Remove all bedding material, manure, etc., from maternity pen area; make sure walls and corners are clean.

Step 4. For hard surfaces, use a broom to sweep entire area, concentrating on corners and hard-to-reach spots.

Step 5. Scrub maternity pen with detergent using a brush, broom, or low-pressure sprayer. Follow label instructions for mixing detergent.

Step 6. Disinfect maternity area with strong, commercial-grade disinfectant. Follow label instructions for mixing. Apply with a broom in a scrubbing fashion, wetting the entire area.

Step 7. Allow maternity pens to air dry.

Step 8. Sprinkle hydrated lime on all dry concrete surfaces. Apply at a rate of 1 pound per 48 square feet (12 x 12 ft pen requires 3 lb lime).

Step 9. Bed maternity pens using straw or another suitable material. When using straw, add enough to cover your leg to midcalf, about 10 to 12 inches. Bedding should be deep enough to allow you to drop to your knees without pain. Bedding should be dry enough that after kneeling for at least one minute, your knees are dry.

Step 10. Cows and heifers should be moved to clean maternity pens only when they show signs of calving to keep pens as clean and dry as possible.

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Group Maternity Pen Maintenance

Skills Needed: Attention to detail.

Equipment Needed: maternity pen, manure-handling equipment, shovel, fork, broom, detergent, disinfectant, hydrated lime, bedding material.

Time Required: 15 minutes.

WHY? Most calves begin their lives in the maternity pen. It must be a clean, disinfected environment to minimize stress and risk of infection. Group pens provide more opportunity for infection than individual pens. Therefore, they must be managed with great care.

HOW?

Step 1. Maternity pens should provide 150 feet per cow and have an appropriate floor surface that is sloped for drainage of water and urine.

Step 2. Bed pens regularly to maintain a clean, dry environment. Daily maintenance would be ideal, but adding bedding when 5% or more of the surface is soiled should be adequate (this will depend on the number of animals in each pen and pen size).

Step 3. Bedding should be at least 4 inches deep, and dry enough that your knees are dry after kneeling.

Step 4. When possible, remove contaminated bedding material from pen after each calving.

Step 5. Clean group pens thoroughly every other week following Chore Plan 1B. Conduct more frequent cleanings if pens are heavily used or if a disease outbreak occurs.

Step 6. Cows and heifers should be moved to clean, dry maternity pens only when they show signs of calving to keep pens as clean and dry as possible.

Questions? Please see the herd manager. Thank you, and keep up the good work!
Calving Process and Observation

Skills Needed: Decision making skills and basic knowledge of calving physiology.

Equipment Needed: Clean maternity pen, calving due dates.

Time Required: 1 to 2 hours.

WHY? The first priority for new calves is a smooth, rapid delivery with as little trauma as possible. It is best that the cow perform this function. However, it is possible that she will need some assistance. You must know and understand the stages of the birth process.

HOW?

Step 1. Observe cow closely; look for physical changes and signs of birth. Learn the stages of the birth process described below.

Step 2. Once signs of calving are observed, move cow to maternity pen.

Step 3. Respond to the needs of the cow and the situation, and make good decisions quickly. If you are going to assist the delivery, refer to Chore Plan 1E. If you are unable to assist, seek help.

The birth process is divided into three continuous stages:

**STAGE 1 - Pre-calving preparation**

- Cervical dilation and uterine contractions position calf.
- Lasts 3 to 6 hours, often 4 to 10 hours in heifers.
- Vulva becomes swollen and enlarged.
- Pelvic ligaments relax, causing sunken appearance around tailhead.
- Vaginal mucus increases; becomes clear and elastic, similar to estrus.
- Contractions about 15 minutes apart.
- Cow isolates herself.
- Cow becomes restless, stands and lies repeatedly.
- Cow kicks at abdomen or looks at her side.
- *If Stage 1 persists longer than 4 hours or appears to stop, have an experienced individual examine the cow.*
**STAGE 2 - Calving**

- Active abdominal contractions; water bag (chorioallantois) and fetus in the birth canal.
- Typically lasts 1 to 4 hours.
- Cow strains with frequent contractions and short periods of rest.
- Water bag breaks.
- Calf is pushed through the cervix and into the vagina.
- Calf’s feet appear through the vulva.
- Second membrane (amnion) breaks to lubricate birth canal and assist passage of calf.
- Cow may rest after head and shoulders are delivered.
- Body of calf will pass rapidly or may fall out if the cow stands.
- Most cows finish the final stages of labor on their sides.
- *If calf is not delivered by 2 hours after water bag appears, have an experienced individual examine the cow.*

**STAGE 3 - Passing of the afterbirth**

- The afterbirth is expelled from the vulva.
- This should occur within 8 hours of birth.
- If afterbirth is not expelled within 12 to 24 hours, treat the cow for a retained placenta.
- **Do not pull on afterbirth or try to remove it manually.**
- *If afterbirth is not expelled, have the cow examined by a veterinarian or another experienced individual.*

Questions? Please see the herd manager.  
Thank you, and keep up the good work!
Calving Action Plan

Observe close-up cows for signs of calving.

When calving signs are observed, move the cow to a maternity pen.

1. Fill 2 one-gallon buckets with warm water and 2 to 3 ounces of iodine.
2. Place calving chains in one of the buckets.
3. Using the other bucket, wash the cow’s vulva and rectal area.

Is calving progressing normally?

No

1. Make sure calf is breathing.
2. Rub calf briskly with straw or dry bath towels.
3. Remove membranes and mucus from mouth and nose.
4. Dip navel with 7% tincture of iodine.
5. Weigh calf.
6. Ear-tag calf with next number in sequence.
7. Record ALL calving information.

Yes

Can you assist the cow properly?

No

1. Contact the herds person on duty.
2. If no one is available, call the veterinarian.
3. Review Chore Plan 1E and work on your calving assistance skills.

Yes

1. Check colostrum quality using the colostrometer. Feed only colostrum testing green for first feeding.
2. Feed 3 quarts of colostrum via nipple bottle within 1 hour of birth, then repeat 8 hours later. OR Feed 4 quarts of colostrum by esophageal feeder within 1 hour of birth.
3. Record amount fed, date, time and feeder.

Thoroughly clean calving pen and re-bed with lime and straw.
Calving Problems and Assistance

Skills Needed: Decision making skills and advanced knowledge of calving physiology.

Equipment Needed: Pulling chains, 2 buckets of warm water, disinfectant soap, lubricant, plastic arm sleeves.

Time Required: Depends on situation.

WHY? In the event of a difficult calving, assistance may be necessary to ensure safe delivery of a live calf. The care provider should understand techniques used to provide assistance.

HOW?

Step 1. Most births proceed normally and do not need assistance. Rushing often causes more problems than it solves.

Step 2. Sanitary practices are very important. Using one of the warm water buckets, scrub hands and arms with disinfectant soap before examining the cow.

Step 3. Using the other bucket of warm water and disinfectant soap, thoroughly wash the vulva and rectal area of the cow.

Step 4. Apply a generous amount of lubricant to your clean or gloved hand, and insert it into the vulva. Form fingers and thumb into a cone and gently push through the vulva.

Step 5. Once your hand is in the cow, it can be flattened, with the palm facing down, and moved inward along the roof of the vagina.

Step 6. To determine the presentation of the calf, feel for the calf’s nose. If the calf is in a forward position, run a hand along the jawbone to the neck. At the neck, feel for a leg; trace that leg to locate the shoulder. Do the same with the other leg. Normal position is jaw resting on legs with nose forward.

Step 7. When the calf is presented in a forward position, place chains around the legs above and below the fetlock. Pull calf with gradually increasing force, but never use more than 2 people or 400 pounds of force.

Step 8. Pull one leg until about 4 inches of it are outside the vulva. Then pull the second leg the same distance. Repeat this process, walking the calf out by pulling legs alternately.

Normal presentation.
Step 9. Once the head and shoulders are delivered, rotate the calf half a turn before continuing.

Step 10. Once the hips are delivered, the rest of the calf should slide out easily. Let the cow finish the delivery on her own.

Step 11. Insert a clean piece of straw into the calf’s nostrils to tickle its nose and stimulate a sneeze. If necessary, remove mucus from the mouth and nose using clean or gloved fingers.

Step 12. Examine the cow to check for a twin calf and look for calving injuries.

Step 13. Allow the cow to lick the calf off before moving the calf to preweaning housing. (Note: if disease risk is high or the cow has a known infection, remove the calf immediately. Towel dry the calf for 2 to 5 minutes.)

Step 14. Use caution when handling newborn calves. Even if cows seem friendly and docile, they can become annoyed and extremely dangerous when their calves are handled or removed.

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Navel Cord Dipping

Skills Needed: Ability to follow directions and ability to handle calves.

Equipment Needed: Teat dip bottle containing 7% tincture of iodine.

Time Required: 2 minutes.

WHY? The navel cord provides a direct pathway to the blood supply. It should be completely dipped in a tincture of iodine shortly after birth to dry the cord and to reduce the chance of harmful organisms entering the body.

HOW?

Step 1. Dip the navel within 30 minutes of birth, while the navel is still wet. If the calf is standing, gently hold and steady it.

Step 2. Using a teat dip bottle (do not use a spray bottle), squeeze up enough tincture of iodine to fill the dip cup. Do not use teat dip or solutions containing less than 7% tincture of iodine.

Step 3. Totally submerge the navel cord in iodine. Gently push the teat cup against the abdomen, and move teat cup back and forth a few times. Leave a circle of iodine around the base of the navel.

Step 4. If the calf is lying down, totally submerge the navel cord in iodine, then tip the teat cup and allow iodine to coat the base of the navel.

Step 5. If the navel cord is covered with dirt, manure, or sawdust, use a two-dip process. First, pour some iodine solution into a separate container and use this to wash the navel. Then, use the squeeze teat dip bottle to dip the clean navel. Discard the dirty iodine solution used to wash the navel.

Step 6. The navel may be dipped again 12 hours later to speed drying. This practice is recommended for calves born into dirty environments.

Step 7. By 24 to 36 hours the cord should be shriveled and dry. If it remains flexible and smooth or is enlarged, dip it daily until it shrivels.

Step 8. For the first 3 days, check the navel cord for bleeding, infection, and flies.

Step 9. The calf should be bedded on straw for a soft, moisture-free environment that will help the navel cord heal.

*If the navel cord is extremely short or completely broken off, cover the area with iodine and have a veterinarian examine the calf within 7 to 10 days.*
Questions? Please see the herd manager.

Thank you, and keep up the good work!
Identification and Tagging

Skills Needed: Ability to follow directions, ability to handle and restrain calf, and ability to operate ear tagging and tattoo applicators.

Equipment Needed: Halter, ear tag applicator, numbered ear tags, antiseptic, tattoo applicator, indelible ink, piece of cardboard, isopropyl alcohol, cotton balls.

Time Required: 5 minutes.

WHY? Newborn calf identification and tagging is essential to make accurate management decisions. The calf’s sire, dam, and date of birth are recorded, and the calf is permanently identified.

HOW?

Ear Tagging is not permanent. It is an easy and excellent way to quickly identify calves. All calves should receive tags.

Step 1. Select and record the appropriate tag number following the sequence in the herd’s record book.

Step 2. Insert the tag into the appropriate tag applicator. When two-part tags are used, be sure to line up the tag halves and use the correct pin.

Step 3. Restrain the calf. (Chore Plan 6D)

Step 4. Select the tagging site on the ear:
  - If using two-piece tags, place between or below cartilage ribs.
  - If applying metal tags, place at top of the ear, near the base. Leave a small space, about the width of a pencil, between the ear and the edge of the tag to prevent the ear from growing into the tag.
  - If using one-piece tags, place between cartilage ribs, half the distance from base to tip of the ear.

Step 5. Insert the ear tag:
  - Apply two-piece tags with plier-type applicator by squeezing the handles until the ear tag snaps together.
  - Apply metal tags with tag pliers by squeezing handles together until tag points go through the ear and join together.
  - Apply one-piece tags with the knife-type applicator. Force the applicator through the ear with extreme care not to tear the ear. Be sure the knife slit in the ear is turned, so tag hangs straight down or at an angle away from the base of the ear.
Step 6. Treat the wound both inside and outside the ear with antiseptic to prevent infection.

*Tattooing* is a permanent means of identification. The tattoo instrument is a plier-type device with numbers and letters made out of needlelike projections that pierce the ear when the handles are squeezed together. Ink is then rubbed into the small punctures, producing a permanent identification mark.

**Step 1.** Restrain the calf.

**Step 2.** Select the identification numbers and/or letters to be used, and set or insert into tattooing instrument. Record the calf’s tattoo.

**Step 3.** Check numbers and/or letters by tattooing a piece of cardboard before tattooing the calf.

**Step 4.** Use alcohol-soaked cotton balls to clean the inside of the right ear.

**Step 5.** Locate the tattoo area on the right ear. Position tattoo in the middle portion of the inner ear, just below the topmost cartilage rib.

**Step 6.** Rub tattooing ink on the inside of the ear between the topmost cartilage rib and the middle cartilage rib before tattooing.

**Step 7.** Position the tattoo instrument so numbers and/or letters are positioned in the space between the top and middle cartilage rib. Squeeze the handles together quickly and completely.

**Step 8.** Rub the tattoo puncture full of ink using fingers, toothbrush, or roll-on applicator.

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Weighing and Measuring

Skills Needed: Consistency, attention to detail, ability to follow directions, ability to operate calf scale and read weight tape and height measuring stick, and ability to handle calf.

Equipment Needed: Portable calf scale or weight tape, height measuring stick, record book.

Time Required: 5 minutes.

WHY? Birth weight is needed to determine feeding amounts for calves fed by percent of body weight. Accurate growth records help evaluate feeding and management practices with objective measurements, such as average daily gain (ADG).

HOW?

Step 1. All calves should be weighed and measured using a portable calf scale or weight tape and height stick. Stand the calf on a hard, level surface and hold the head in a normal, upright position.

Step 2. Newborn calves should be weighed before colostrum feeding.

Step 3. Older calves should be weighed when they are handled for any reason.

Step 4. All calves should be measured as follows:

- **Body weight** (heart girth, just behind front legs) – use scale or weight tape.
- **Withers height** (floor to highest point) – use height stick.
- **Hip height** (floor to top of hip) – use height stick.
Step 5. If feeding milk as a percent of body weight, calculate amount to feed:

- Example: Feeding 12% of body weight, calf weighs 100 lb.
- Multiply 100 lb by 0.12 (100 lb x .12 = 12 lb).
- Divide the result by the number of feedings each day (12 lb / 2 = 6 lb).
- Feed the calf 6 pounds at each of 2 daily feedings.

Step 6. Determine average daily gain (ADG) using this formula:

\[
\text{current weight} \ - \ \text{previous weight} \over \text{days since last measurement}
\]

- Example: Last week calf weighed 100 lb, this week calf weighs 108 lb.

\[
\frac{108 \ - \ 100}{7} = 1.14
\]

- Determine the weight gain: 108 lb – 100 lb = 8 lb.
- Divide the weight gain by the number of days since the last measurement:
  8 lb divided by 7 days = 1.14.
- The calf gained 1.14 lb per day.

Questions? Please see the herd manager. Thank you, and keep up the good work!
COLOSTRUM MANAGEMENT:

INTRODUCTION: Colostrum is the thick, yellow, sticky, first milk following a normal period of mammary involution. It is the first and most important feed given to a newborn calf and is the newborn dairy calf’s primary source of nutrients. In addition, calves are born without protection from sickness and disease. Colostrum provides the antibodies needed to maintain health and to reduce the risk of sickness and death. Proper colostrum management is essential to raising healthy calves.

Colostrum management includes these chores:

A. Quality Testing Using the Colostrometer
B. Quality Testing Using the Quick Test
C. Antibody Transfer Using Total Protein
D. Testing Antibody Transfer with the Quick Test
E. Colostrum Storage
F. Thawing in Water
G. Microwave Thawing
H. Feeding Colostrum
I. Esophageal Feeder

CHORE OUTCOMES:

<table>
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<tr>
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<th>IF YOU DO</th>
<th>IF YOU DON’T</th>
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<tbody>
<tr>
<td><strong>2A and 2B. Quality testing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Colostrum quality quickly identified.</td>
<td>• Colostrum quality unknown.</td>
<td></td>
</tr>
<tr>
<td>• Only good-quality colostrum fed or stored.</td>
<td>• All colostrum fed or stored, including poor-quality.</td>
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</tr>
<tr>
<td>• Increased health and survival.</td>
<td>• Reduced health and survival.</td>
<td></td>
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<tr>
<td><strong>2C and 2D. Antibody transfer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Transfer of antibodies from colostrum to calf assessed.</td>
<td>• Transfer of antibodies unknown.</td>
<td></td>
</tr>
<tr>
<td>• Colostrum management monitored and evaluated.</td>
<td>• No system to monitor or evaluate colostrum program.</td>
<td></td>
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<tr>
<td><strong>2E. Colostrum storage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Highest-quality colostrum saved for future use.</td>
<td>• May be forced to use lower-quality colostrum.</td>
<td></td>
</tr>
<tr>
<td>• Adequate and known quantity ensured.</td>
<td>• Inadequate or unknown quantity might be fed.</td>
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</tr>
<tr>
<td>• Reduced disease transmission by testing before storage.</td>
<td>• Continued disease transmission.</td>
<td></td>
</tr>
<tr>
<td>2F and 2G. Thawing colostrum</td>
<td>2H. Feeding colostrum</td>
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<td>-------------------------------</td>
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<tr>
<td>• Antibody concentration and activity maintained.</td>
<td>• Reduced antibody concentration and activity.</td>
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<tr>
<td></td>
<td>• Reduced immunity when too little poor-quality colostrum is fed too late.</td>
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<tr>
<td></td>
<td>• Increased illness and death.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Increased health costs.</td>
<td></td>
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<tr>
<td></td>
<td>• Increased immunity achieved by proper quantity, quality, and timing of colostrum feeding.</td>
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<tr>
<td></td>
<td>• Increased survival and health.</td>
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<td></td>
<td>• Reduced health costs.</td>
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<tr>
<td></td>
<td>• Reduced immunity when too little poor-quality colostrum is fed too late.</td>
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<td></td>
<td>• Increased illness and death.</td>
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<tr>
<td></td>
<td>• Increased health costs.</td>
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<table>
<thead>
<tr>
<th>2I. Esophageal feeder</th>
<th></th>
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<tbody>
<tr>
<td>• Increased immunity in weak calves due to controlled quantity and timing of colostrum feeding.</td>
<td>• Reduced immunity in weak calves that refuse to suckle colostrum.</td>
</tr>
<tr>
<td>• Increased survival of weak or slow calves.</td>
<td>• Increased death rate and health problems for weak calves.</td>
</tr>
</tbody>
</table>

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Quality Testing Using the Colostrometer

Skills Needed: Cleanliness, attention to detail, and ability to follow directions.

Equipment Needed: Colostrum measuring device, measuring cylinder.

Time Required: 5 minutes.

WHY? A colostrum measuring device is used to test the quality of colostrum fed to calves. It is essential that calves receive high-quality colostrum.

HOW?

Step 1. Wash the udder and check for abnormal milk before milking. Do not feed excessively bloody or mastitic colostrum.

Step 2. Collect only first-milking colostrum in a clean, dry container.

Step 3. Transfer about 0.5 quart of colostrum into the measuring cylinder (fill the measuring cylinder about two-thirds full).

Step 4. Allow the colostrum sample to cool to room temperature (72°F). Remaining colostrum should be cooled to below 40°F as soon as possible to prevent bacterial growth.

Step 5. Gently lower the colostrum measuring device into the measuring cylinder filled with colostrum. The measuring device should float freely in the measuring cylinder. Avoid wetting the unsubmerged portion.

Step 6. While the colostrum measuring device floats, determine colostrum quality using the color-coded scale located inside the unsubmerged portion.

Step 7. Reading results:

GREEN – High quality; use or store for first feeding.

YELLOW – Medium quality; use or store for second or third feeding.

RED – Poor quality; use only for calves more than 1 day old. Do not store.
Step 8. Rinse colostrum measuring device in cold water before storage; make sure all scum and milk fat are removed. Use soapy water if necessary.

Step 9. If necessary, colostrum quality may be tested at body temperature (fresh from the cow). The warmer temperature lowers quality measurements, and colostrum testing YELLOW will typically register GREEN at 72°F. In other words, *colostrum tested at body temperature can be used for first feeding if it tests YELLOW or GREEN*. Do not feed colostrum that registers RED.

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Quality Testing Using the Quick Test

Skills Needed: Cleanliness, attention to detail, and ability to follow directions.

Equipment Needed: Complete Quick Test kit, colostrum sample, marker.

Time Required: 25 minutes.

WHY? A Quick Test can be used to test the quality of colostrum fed to calves. It is essential that calves receive high-quality colostrum.

HOW?

Step 1. Collect first-milking colostrum in a clean, dry container.

Step 2. Check the expiration date on the test kit. Do not use expired kits.

Step 3. Remove the Quick Test cassette from its foil wrapper and label the cassette with the cow’s number or name. Place the cassette on a level surface.

Step 4. Remove the seal and cap from the dilution bottle in the kit.

Step 5. Use the clean pipette included with the kit to draw up a colostrum sample. Be careful to always hold the pipette straight up, in a vertical position. Failure to do so will affect the volume of the sample drop and may affect the test results.

Step 6. Fully depress the pipette bulb, then place the tip of the pipette into the colostrum.

Step 7. Slowly release the bulb, which will draw colostrum into the pipette. The pipette will not be completely full.

Step 8. Gently squeeze the bulb and place a single drop of colostrum in the dilution vial. Do not add the entire contents of the pipette to the dilution vial. Do not rinse the pipette in the dilution solution. Discard this pipette.

Step 9. Put the cap back on the dilution vial and slowly invert the sample several times to mix the solution. Do not shake the sample.

Step 10. Remove the cap from the dilution vial.

Step 11. Using a clean pipette, depress the bulb fully and insert the pipette into the mixed sample.

Step 12. Slowly release the bulb, drawing the sample into the pipette.

Step 13. Gently squeeze the bulb to release 3 drops of solution onto the test cassette at the location marked “S.”

Step 14. Wait 20 minutes. Accurate readings can be made at least 20 minutes, but no more than 40 minutes, after completing Step 13.

Step 15. Read the results of the test:
A **single line** at the “C” marking indicates the colostrum contains adequate IgG (> 50 g/L).

**Two lines**, at the “C” marking and at the “T” marking, indicate that the colostrum does not contain adequate IgG (< 50 g/L). Even a faint line at the “T” marking means the colostrum is inadequate.

Note: If **no line** appears at the “C” position, the test did not work. Discard this cassette and repeat procedure with a new sample.

**Step 16.** Discard all materials in accordance with local environmental regulations. If test solution is poured down a drain, **flush with large volumes of water**. This will prevent build up of highly explosive compounds that form when sodium azide in the dilution solution reacts with lead or copper in pipes.

**Questions? Please see the herd manager.**

**Thank you, and keep up the good work!**
Antibody Transfer Using Total Protein

Skills Needed: Attention to detail, cleanliness, and ability to follow directions.

Equipment Needed: Refractometer, syringe, 18-gauge one-inch needle, test tube, plastic transfer pipette or eye dropper.

Time Required: 15 minutes.

WHY? Immuglobulins (IgG, antibodies) are essential for calf survival. IgG is transferred from cow to calf by colostrum. Calves absorb IgG into their blood, where it protects them from disease. A refractometer indirectly estimates the amount of IgG in blood.

HOW?

Step 1. Identify calves 2 to 5 days of age for testing.

Step 2. Collect a jugular blood sample from each calf (see Chore Plan 7J) 1 to 2 hours after milk feeding.

Step 3. Allow blood to sit undisturbed for 24 hours. Serum (yellow liquid) will rise to the top (if a centrifuge is available, spin blood for 15 minutes at 4000 rpm).

Step 4. Using a transfer pipette or eye dropper, place one drop of serum on the optical surface of the refractometer, and gently close the lid over the sample.

Step 5. Look through the eyepiece, and read the value where the optical field is split (dark color above and light color below). This value is grams of total protein per 100 ml of serum.

Step 6. The reading should be at least 5.5 to 6 grams per deciliter (100 ml) for adequate antibody protection.

Step 7. Record refractometer readings, and use them to evaluate colostrum management. Take corrective action if needed.

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Sample of the scale inside a refractometer. Often more than one scale is shown; look for the one designed for protein (measured in grams per deciliter or 100 milliliters).

Read the scale at the interface between the light and dark areas; in this case 6 g/dl (or 100 ml).
Testing Antibody Transfer with the Quick Test

Skills Needed: Cleanliness, attention to detail, and ability to follow directions.

Equipment Needed: Complete Quick Test kit for whole blood or plasma, blood or plasma sample, 200 uL pipetter, marker.

Time Required: 25 minutes.

WHY? Immunoglobulins (IgG, antibodies) are essential for calf survival. IgG is transferred from cow to calf by colostrum. Calves absorb IgG into their blood, where it protects them from disease. The Quick Test can be used to test the amount of IgG in blood.

HOW?

Step 1. Two separate test kits are available for testing either whole blood or blood plasma. Collect the appropriate blood or plasma sample (Chore Plan 7J).

Step 2. Check the expiration date on the test kit. Do not use expired kits.

Step 3. Remove the Quick Test cassette from its foil wrapper and label the cassette with the calf’s number or name. Place the cassette on a level surface.

Step 4. Place a clean pipette tip from the test kit onto the pipetter.

Step 5. Gently swirl the blood or plasma sample to mix it.

Step 6. Remove the seal and cap from the dilution bottle in the kit.

Step 7. Fully depress the pipetter plunger, then place the tip of the pipette into the sample.

Step 8. Slowly release the plunger, which will draw the sample into the pipette tip.

Step 9. Place the tip of the pipette against the side of the dilution vial and gently depress the plunger to release the sample in the dilution vial. Add the entire contents of the pipette to the dilution vial. Rinse the pipette tip in the dilution solution by repeatedly drawing up and releasing the solution (three to four times).

Step 10. Put the cap back on the dilution vial and slowly invert the sample several times to mix the solution. Do not shake the sample.

Step 11. Remove the cap from the dilution vial.

Step 12. Using the same pipetter and pipette tip, depress the plunger fully and insert the pipette into the mixed sample.

Step 13. Slowly release the plunger, drawing the sample into the pipette tip.

Step 14. Gently depress the plunger to release solution onto the test cassette sample well (marked “S”). When using the plasma kit, fill the sample well completely. When using the whole blood kit, place only 3 to 4 drops of blood in the sample well.
Step 15. Wait 20 minutes. Accurate readings can be made at least 20 minutes, but no more than 40 minutes, after completing Step 14.

Step 16. Read the results of the test:

A single line at the “C” marking indicates the sample contains adequate IgG (> 10 g/L).

Two lines, at the “C” marking and at the “T” marking, indicate that the sample does not contain adequate IgG (< 10 g/L). Even a faint line at the “T” marking means the IgG level is inadequate.

Note: If no line appears at the “C” position, the test did not work. Discard this cassette and repeat procedure with a new sample.

Step 17. Discard all materials in accordance with local environmental regulations. If test solution is poured down a drain, flush with large volumes of water. This will prevent build up of highly explosive compounds that form when sodium azide in the dilution solution reacts with lead or copper in pipes.

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Colostrum Storage

Skills Needed: Attention to detail, cleanliness, organization, and ability to follow directions.

Equipment Needed: Freezer, 1-gallon freezer bags, measuring container, permanent marker, sticky labels.

Time Required: 10 minutes.

WHY? Colostrum is so important for the survival of newborn calves that a supply must be kept on hand to ensure all calves receive a consistently high-quality, predetermined amount of colostrum.

HOW?

Step 1. Store colostrum from mature cows tested free of Johne’s and Bovine Leukosis. Do not store colostrum from cows with mastitis or any other infection.

Step 2. Store colostrum after testing quality (Chore Plan 2A or 2B).
GREEN – High quality, first feeding.
YELLOW – Medium quality, second or third feeding; do not freeze.
DO NOT store colostrum that reads RED on a colostrum measuring device.

Frozen Colostrum

Step 3. Label 1-gallon freezer bags with cow id, disease status, date, and quality.
Step 4. Place 2 quarts of colostrum in each 1-gallon freezer bag. If bags tend to leak during thawing, place the bag containing colostrum inside another bag.
Step 5. Freeze filled bags of colostrum at -10°F to -15°F.
Step 6. Stack filled bags flat with the oldest on top to save space and preserve the quality of your inventory.

Fresh Colostrum

Step 7. Chill colostrum immediately after collection.
Step 8. Store in the refrigerator (40°F) in covered, 2-quart containers for less than 24 hours.
Step 9. Add 10 mL of potassium sorbate (50% solution) per half gallon of colostrum to limit bacterial growth in storage. This will extend the time you can store colostrum in the refrigerator to about 4 days.

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Thawing in Water

**Skills Needed:** Attention to detail and ability to follow directions.

**Equipment Needed:** Frozen colostrum, sink, bucket, warm water, thermometer, extra freezer bag.

**Time Required:** 30 to 40 minutes, thaw while doing other calf chores.

**WHY?** Stored colostrum is thawed when needed to feed a newborn calf. Proper thawing maintains the concentration and activity of antibodies. Overheating destroys antibodies and reduces colostrum quality.

**HOW?**

**Step 1.** Check dates on frozen colostrum; use oldest first. It is best to use colostrum within one year of the date it was frozen.

**Step 2.** Remove a frozen 1-gallon bag containing 2 quarts of high-quality colostrum from freezer.

**Step 3.** Place bag in a bucket of warm water (less than 120°F). If bags tend to leak during thawing, place the bag containing frozen colostrum inside another bag before thawing in water.

**Step 4.** Allow colostrum to sit in the bucket until it thaws (while doing other calf-feeding chores).

**Step 5.** In cold weather, warm colostrum to 102 to 105°F before feeding to reduce stress on the calf.

**Step 6.** Use as needed.

**Questions?** Please see the herd manager. **Thank you, and keep up the good work!**
Microwave Thawing

Skills Needed: Attention to detail and ability to follow directions.

Equipment Needed: Frozen colostrum, microwave with low power settings and turntable, extra freezer bag or plastic bucket, thermometer.

Time Required: 30 to 40 minutes.

WHY?  Stored colostrum is thawed when needed to feed a newborn calf. Proper thawing maintains the concentration and activity of antibodies. Overheating destroys antibodies and reduces colostrum quality.

HOW?

Step 1. Check dates on frozen colostrum; use oldest first. It is best to use colostrum within one year of the date it was frozen.

Step 2. Remove a frozen 1-gallon bag containing 2 quarts of high-quality colostrum from freezer.

Step 3. Place bag in microwave. If bags tend to leak during thawing, place the bag containing frozen colostrum inside another bag or a plastic bucket before thawing.

Step 4. Microwave on the defrost setting for 1 to 2 minutes.

Step 5. Remove colostrum from microwave and pour thawed liquid into a clean, dry container (or nipple bottle).

Step 6. Repeat steps 4 and 5 until all colostrum thaws.

Step 7. In cold weather, warm colostrum to 102 to 105°F before feeding to reduce stress on the calf.

Step 8. Use as needed.

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Feeding Colostrum

Skills Needed: Patience, attention to detail, sensitivity to calf, basic calf health knowledge, consistency, and ability to follow directions.

Needed: Good-quality fresh or thawed colostrum, nipple bottle or bucket, esophageal feeder, record book.

Time Required: 10 minutes per feeding.

WHY? Calves have no protection from disease at birth. Colostrum is the source of antibodies that protect them from infection. Without colostrum calves are much more likely to suffer sickness or death.

HOW?

Step 1. Obtain fresh colostrum from the dam or thaw frozen colostrum (follow Chore Plan 2F or 2G).

Step 2. Feed colostrum tested with a colostrum measuring device and labeled GREEN (first feeding) or YELLOW (second or third feeding) using a nipple bottle.

Step 3. Sanitize nipple bottle before each use (follow Chore Plan 4B).

Step 4. To get the calf to suckle from the nipple bottle, use a clean or gloved finger to stimulate the suckling reflex. Then place the nipple in the calf’s mouth; keeping the bottle below the plane of the shoulder.

Step 5. Feed 3 quarts of colostrum via nipple bottle within 1 hour of birth, then repeat 8 hours later. OR Feed 4 quarts of colostrum by esophageal feeder within 1 hour of birth.

Step 6. If calf does not drink within 1 hour, use an esophageal feeder (follow Chore Plan 2I).

Step 7. Record date, time, feeder, and amount fed.

Step 8. Clean feeding equipment, nipple bottles, esophageal feeder, etc., following Chore Plan 4A.

Questions? Please see the herd manager. Thank you, and keep up the good work!
Esophageal Feeder

Skills Needed: Ability to restrain calf and basic calf health and anatomy knowledge.

Equipment Needed: Good-quality fresh or thawed colostrum, esophageal feeder.

Time Required: 5 to 15 minutes.

WHY? Using an esophageal feeder ensures calves receive the required amount of colostrum within the required time. Use the esophageal feeder carefully to avoid injuring calves. Esophageal feeders are especially useful for weak or stubborn calves that will not drink on their own.

HOW?

Step 1. Use esophageal feeder if calf will not drink within first hour of life.

Step 2. Sanitize esophageal feeder and tube before use; follow Chore Plan 4B.

Step 3. Close the pinch clamp located on the tube of the esophageal feeder or unscrew the tube from the feeder bottle. If the tube is cold, place it in warm water to make it more pliable.

Step 4. Fill the feeder with 4 quarts of fresh or thawed GREEN label colostrum that has been warmed to body temperature (about 102°F).

Step 5. Secure calf in safe, clean environment. Feeding is easier if calf stands and is backed into a corner (calves can be fed while lying down if necessary).

Step 6. Determine the length of the tube to be inserted. Measure from the tip of the nose to the point of the shoulder. Typically, this is about 20 inches.

Step 7. Lubricate the ball end of the tube with a little colostrum.

Step 8. Extend calf’s head and open the mouth by applying pressure to the corner or roof of the mouth.

Step 9. Place the ball end of the tube in calf’s open mouth. Pass it along the tongue. The calf should start chewing and swallowing.
Step 10. Push the tube down the esophagus (left side of the mouth and neck) gently and slowly. Be sure not to place it in the windpipe. Feel the left side of the neck to make sure probe and tube are moving down the esophagus.

Step 11. Stop pushing when tube is inserted to the length you measured.

Step 12. Open pinch clamp and elevate bag to increase flow.

Step 13. When feeder bag has emptied, slowly remove tube from esophagus.

Step 14. Wash and disinfect after use (see Chore Plan 4A). Dry before storing.

Questions? Please see the herd manager.
Thank you, and keep up the good work!
LIQUID FEED MANAGEMENT:

**INTRODUCTION:** Liquid feeds provide most of the nutrients for young calves. Feeding rates and feed quality influence the growth and health of calves. Use only good-quality feeds and follow mixing and feeding directions for milk replacers carefully.

Liquid feed management includes these functions:
- A. Milk Replacer Quality Check
- B. Milk Replacer Mixing
- C. Pasteurized Waste Milk
- D. Liquid Feeding

**CHORE OUTCOMES:**

<table>
<thead>
<tr>
<th>IF YOU DO</th>
<th>IF YOU DON’T</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3A. Milk replacer quality check</strong></td>
<td></td>
</tr>
<tr>
<td>• Good-quality milk replacer fed.</td>
<td>• Poor-quality milk replacer may be fed.</td>
</tr>
<tr>
<td>• Required nutrients provided.</td>
<td>• Required nutrients not provided.</td>
</tr>
<tr>
<td>• Product value confirmed.</td>
<td>• Economic loss from reduced growth and health.</td>
</tr>
<tr>
<td><strong>3B. Milk replacer mixing</strong></td>
<td></td>
</tr>
<tr>
<td>• Ingredients dissolved and distributed evenly.</td>
<td>• Ingredients clumped and undissolved.</td>
</tr>
<tr>
<td>• Reduced foam and sediment formation, increasing palatability.</td>
<td>• Increased foam and sediment formation, reducing palatability.</td>
</tr>
<tr>
<td>• Nutrients provided to calves.</td>
<td>• Nutrients not provided to calves.</td>
</tr>
<tr>
<td></td>
<td>• Sickness and death.</td>
</tr>
<tr>
<td><strong>3C. Pasteurized waste milk</strong></td>
<td></td>
</tr>
<tr>
<td>• Reduced microbial load.</td>
<td>• Microbial load unchanged.</td>
</tr>
<tr>
<td>• Decreased risk of disease transfer from cows to calves.</td>
<td>• Increased risk of disease transfer from cows to calves.</td>
</tr>
<tr>
<td><strong>3D. Liquid feeding</strong></td>
<td></td>
</tr>
<tr>
<td>• Healthy, fast-growing calves.</td>
<td>• Health problems and reduced growth.</td>
</tr>
<tr>
<td>• Required nutrients provided.</td>
<td>• Starvation, sickness, and death.</td>
</tr>
</tbody>
</table>

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Milk Replacer Quality Check

**Skills Needed:** Knowledge of basic calf nutrition, ability to read and understand labels, and ability to lift 50-pound bag.

**Equipment Needed:** Milk replacer, milk replacer label.

**Time Required:** 2 minutes.

**WHY?** The health and growth of calves are directly related to milk replacer quality. Spoiled, moldy, or outdated milk replacer also can affect the health and growth of preweaned calves.

**HOW?**

**Step 1.** Evaluate the physical quality of milk replacer:

- **Color:** Dry powder should be cream to light tan. Orange to orange-brown color may indicate heat damage.
- **Composition:** Powder should not contain lumps or foreign materials.
- **Smell:** A burnt smell indicates heat damage. Paint, grass, clay, or gasoline odors may mean fat in the milk replacer has spoiled.
- **Taste:** After mixing, milk replacer should have a “milky” taste. Tangy or “sweet-tart” tastes also are acceptable. These flavors should not be confused with a “sour” taste, which indicates rancid fat.
- **Mixability:** Powder should go into solution easily.

**Step 2.** To maintain the quality of milk replacer, opened bags should be stored in airtight containers that keep out dust, cats, and rodents. A 20-gallon plastic garbage can with a tight-fitting lid works well for 50-pound bags.

Questions? Please see the herd manager. Thank you, and keep up the good work!
Milk Replacer Mixing

Skills Needed: Knowledge of basic calf nutrition, attention to detail, ability to read and understand labels, ability to lift a 50-pound bag, and ability to measure ingredients accurately.

Equipment Needed: Milk replacer, milk replacer label, bucket or mixing tub, whisk, warm water (110 to 120°F), measuring container.

Time Required: Determined by amount mixed.

WHY? Proper measurement and mixing of milk replacer ensures that calves receive all of the nutrients essential for good health and growth.

HOW?

Step 1. Inspect the quality of the milk replacer; follow Chore Plan 3A.

Step 2. Follow manufacturer’s instructions for powder and water amounts, water temperature, and mix order (these instructions are typically printed on the label).

Step 3. Measure dried milk replacer and water accurately (for the most accurate measurement, weigh milk replacer powder using a scale; alternatively, use the plastic cup provided by the manufacturer for measuring powder).

Step 4. Using a wire whisk and slow, circular motion, thoroughly mix milk replacer in a bucket. Do not use whipping or fast motion to mix milk replacer. Do not use your hands or wooden utensils.

Step 5. Thoroughly mix milk replacer powder and water until all powder is in solution with no clumps or undissolved powder. Do not overmix; this can cause excessive foaming and separation of fat.

Step 6. Do not let mixed milk replacer stand for more than 15 minutes to avoid excessive cooling (this may allow minerals, medications, and fiber to settle out of solution).

Step 7. Give milk replacer a quick mix with wire whisk before feeding if it has been standing for more than 10 to 15 minutes.

Step 8. Feed milk replacer according to Chore Plan 3D.

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Pasteurized Waste Milk

Skills Needed: Knowledge of basic calf nutrition and attention to detail.

Equipment Needed: Waste milk, pasteurization system with thermometer, cold storage system.

Time Required: Determined by pasteurization process and by amount fed.

WHY? Waste milk can provide adequate nutrition for young calves. However, it must be pasteurized to minimize the risk of spreading disease organisms from cows to calves.

HOW?

Pasteurizing Waste Milk:

Step 1. Collect waste milk (if cow was treated with antibiotics, do not save milk from first or second milking after treatment). Do not save excessively bloody or mastitic milk.

Step 2. Do not allow milk to sit at room temperature before feeding. Waste milk should be cooled to below 40°F or pasteurized immediately.

Step 3. Sanitize pasteurization equipment using sanitizer approved for milk processing equipment. Follow label instructions for concentration and contact time (see Chore Plan 4B).

Step 4. Batch or vat pasteurization: Heat waste milk to at least 145°F and hold it for at least 30 minutes. High temperature, short time pasteurization: Heat waste milk to at least 161°F and hold it for at least 15 seconds.

Step 5. Feed warm pasteurized milk or rapidly cool milk to below 40°F for storage. If milk is not fed soon after pasteurization, it must be kept in cold storage until the next feeding to prevent growth of microorganisms.

Step 6. Clean and sanitize pasteurization equipment (see Chore Plan 4A).

Feeding Pasteurized Waste Milk:

Step 7. Do not dilute pasteurized waste milk.

Step 8. Feed according to Chore Plan 3D.

Questions? Please see the herd manager. Thank you, and keep up the good work!
Liquid Feeding

**Skills Needed:** Knowledge of basic calf nutrition and health, attention to detail, ability to read and understand labels, ability to measure liquid accurately, and ability to work quickly and consistently.

**Equipment Needed:** Mixed milk replacer, undiluted pasteurized waste or whole milk; measuring cup or portable scale; nipple bottle or bucket.

**Time Required:** Determined by number of calves (5 minutes per calf).

**WHY?** A consistent feeding program is essential to the health, growth, and well-being of dairy calves.

**HOW?**

- **Step 1.** Determine amount to feed each calf (established by each farm). For example, if it has been determined that calves are fed at 12% of bodyweight, a calf weighing 100 lb at birth would receive 12 lb of milk per day, usually divided into two 6-lb feedings. *One pint of milk weighs approximately one pound.*

- **Step 2.** Use a measuring cup, marked container, or scale to measure liquid feed accurately. Measure the amount for each calf and pour into a sanitized nipple bottle or bucket (see Chore Plan 4B).

- **Step 3.** *Remember: The actual temperature of milk or milk replacer fed to calves is not as important as day-to-day consistency in feeding temperature.* Follow the same procedures every time calves are fed to ensure consistency.

- **Step 4.** Place bucket or bottle in a sturdy holder.

- **Step 5.** If necessary, use a clean or gloved finger to stimulate suckling reflex. Calf should suckle vigorously and appear excited when finished, if not, write a note on its health check.

- **Step 6.** At feeding time, check all calves for health problems. Calves are most active at this time and problems are easily identified. Follow Chore Plan 7B.

- **Step 7.** If calf does not drink its milk, record amount refused, and write a note on its health check.

- **Step 8.** When calf is finished drinking, remove bucket or bottle and place in sink for cleaning (see Chore Plan 4A).

**Questions?** Please see the herd manager. **Thank you, and keep up the good work!**
CLEANING AND SANITATION:

INTRODUCTION: Young calves are highly susceptible to infection and disease. Limiting their exposure to dirty equipment and housing can prevent illnesses. Keep buckets, nipple bottles, health equipment, calf housing, and maternity pens clean and sanitized to maintain the health of dairy calves.

Important cleaning and sanitation chores include:

A. Cleaning Equipment
** CLEANING ACTION PLAN
B. Sanitizing Equipment
C. Cleaning and Disinfecting Housing
D. Chemical Handling and Safety

CHORE OUTCOMES:

<table>
<thead>
<tr>
<th>IF YOU DO</th>
<th>IF YOU DON'T</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4A. Cleaning equipment</strong></td>
<td><strong>4B. Sanitizing equipment</strong></td>
</tr>
<tr>
<td>- Milk and manure removed.</td>
<td>- Bacteria grown between feedings removed.</td>
</tr>
<tr>
<td>- Reduced sickness and death.</td>
<td>- Reduced sickness and death.</td>
</tr>
<tr>
<td>- Reduced risk of disease transfer.</td>
<td>- Reduced risk of disease transfer.</td>
</tr>
<tr>
<td><strong>4C. Cleaning and disinfecting housing</strong></td>
<td><strong>4D. Chemical handling and safety</strong></td>
</tr>
<tr>
<td>- Reservoirs of microbial growth removed.</td>
<td>- Chemicals mixed and stored properly.</td>
</tr>
<tr>
<td>- Reduced sickness and death.</td>
<td>- Reduced risk of chemical injury to people and animals.</td>
</tr>
<tr>
<td>- Reduced risk of disease transfer.</td>
<td>- Environmental contamination avoided.</td>
</tr>
<tr>
<td>- Microbial reservoirs maintained.</td>
<td>- Chemicals mixed improperly fail to remove microorganisms.</td>
</tr>
<tr>
<td>- Reduced sickness and death.</td>
<td>- People or animals injured.</td>
</tr>
<tr>
<td>- Increased risk of disease transfer.</td>
<td>- Environment contaminated.</td>
</tr>
<tr>
<td>- Increased sickness and death.</td>
<td>- Possible payment of expensive fines.</td>
</tr>
</tbody>
</table>

Cleaning Action Plan is included as an example flow diagram showing the steps of the cleaning process.

Questions? Please see the herd manager. Thank you, and keep up the good work!
Cleaning Equipment

Skills Needed: Attention to detail, consistency, ability to read and understand labels, and ability to work safely with chemicals.

Equipment Needed: Sink with hot and cold water, thermometer, brushes, detergent, sanitizer, measuring cups, drying rack, dirty equipment.

Time Required: Depends on equipment.

WHY? Leftover milk, saliva, blood, or manure on feeding, mixing, and health equipment provide excellent places for bacteria to live and multiply. Properly cleaning all equipment after every use limits the spread of diseases and improves calf health and growth.

HOW?

Step 1. Rinse equipment in lukewarm water (105 to 110°F) to remove leftover milk, manure, and dirt. Do not use hot water.

Step 2. Soak equipment in hot water (140 to 180°F) and alkaline detergent for 5 minutes. Do not let temperature fall below 120°F. Follow manufacturer’s directions for detergent concentration.

Step 3. Scrub all surfaces with a brush to remove dirt.

Step 4. Rinse equipment in warm to hot water (110 to 150°F) and acid sanitizer for 2 to 3 minutes. Follow manufacturer’s directions for sanitizer concentration.

Step 5. Place equipment upside down on a rack to drain and dry. It should be dried completely before next feeding.

Step 6. This general procedure will be adequate in most situations, but it is not intended to replace manufacturers’ recommended procedures. Always read and follow label directions.

Note: This procedure was designed primarily for feeding equipment, but it also works for obstetric chains, balling guns, and other health equipment. Pasteurization equipment may be cleaned following these procedures as well, but be sure to select detergents and sanitizers approved for use in processing equipment (heat makes protein harder to remove).

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Equipment Cleaning Procedure

1. Gather dirty equipment and place in sink.
2. Rinse with lukewarm water (105 to 110°F).
3. Soak for 5 minutes with hot water & detergent (140 to 180°F).
4. Scrub.
5. Rinse for 2 to 3 minutes with hot water & acid sanitizer (110 to 150°F).
6. Drain and place on rack to dry.
Sanitizing Equipment

Skills Needed: Attention to detail, consistency, ability to read and understand labels, and ability to work safely with chemicals.

Equipment Needed: Bucket or sink, hot water, sanitizer, equipment to sanitize.

Time Required: At least 2 minutes.

WHY? Bacteria may multiply on equipment between uses (especially rarely used items or those that remain wet between uses). Sanitizing kills these bacteria and reduces disease transmission.

HOW?

Step 1. Mix chlorine bleach with hot water (the hotter the better) at a rate of 2.5 ounces of household bleach per gallon of water. (Other sanitizers should be mixed according to manufacturer’s directions.)

Step 2. Soak equipment in sanitizing solution for at least 2 minutes before use (the longer the better; see manufacturer’s directions).

Step 3. This general procedure will be adequate in most situations, but it is not intended to replace manufacturers’ recommended procedures. Always read and follow label directions.

Note: This procedure was designed primarily for feeding equipment, but it also works for obstetric chains, balling guns, other health equipment, and pasteurization equipment.

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Cleaning and Disinfecting Housing

Skills Needed: Attention to detail, consistency, ability to read and understand labels, and ability to work safely with chemicals.

Equipment Needed: Fork, shovel, broom, brush or pressure washer, detergent, disinfectant.

Time Required: Depends on housing.

WHY? Unless housing areas are thoroughly cleaned after every use, microorganisms build up in the environment. Regular cleaning limits disease transmission and improves calf health and growth.

HOW?

Step 1. Remove all bedding and visible organic matter. Be sure to clean walls and corners of the pen or hutch.

Step 2. Scrub walls and floor with detergent using a brush or pressure washer. Mix detergent according to manufacturer’s directions.

Step 3. Wash area with a disinfectant solution mixed according to manufacturer’s instructions.

Step 4. Leave housing vacant 2 to 3 weeks between calves to allow complete drying. Allow sunlight into as much of the area as possible. Individual hutches may be flipped over to expose the inside to sun.

Step 5. If possible, move housing to a new location periodically (2 times per year) to allow time and direct sun to disinfect the soil under the area.

Step 6. Once the area dries completely, apply new bedding (see Chore Plan 6C).

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Chemical Handling and Safety

Skills Needed: Attention to detail, ability to read and follow label instructions, and chemical safety training.

Equipment Needed: Chemical storage room, mixing area, measuring containers, protective eyewear, acid-resistant gloves, face shield, protective footwear.

Time Required: Depends on situation.

WHY? Most chemicals used to clean dairy equipment are poisonous and/or corrosive. Safe handling is essential to prevent injuries to people and animals and to avoid environmental contamination.

HOW?

Step 1. Store all cleaning and sanitizing chemicals in a locked room. Be sure chemicals have tight-fitting lids and spouts to prevent fumes and spills.

Step 2. Label chemicals properly and read labels for manufacturers’ mixing, storage, and usage directions. Keep material safety data sheets, and file them near the storage or mixing area.

Step 3. **Mix chemicals in well-ventilated areas only.** Slowly add liquid chemicals to water at the correct temperature, often cold; never add water to chemicals. **Never mix chlorine compounds with other chemicals;** it may produce deadly gas.

Step 4. If chemicals get in eyes or on skin, flush with water for 15 minutes then see a doctor. Remove any contaminated clothing.

Step 5. Rinse empty chemical containers and dispose according to local environmental regulations.

Step 6. Fill in **local emergency numbers** below:

- Poison Control: ______________
- Doctor: ______________________
- Ambulance: ______________
- 911 Emergency: ______________
- Hospital: ______________
- Other: _____________________

Questions? Please see the herd manager.
Thank you, and keep up the good work!
DRY FEED AND WEANING:

INTRODUCTION: Intake of dry grain stimulates rumen development in the calf, which is very important for the calf’s overall digestive system and growth. Offer calves a dry grain mix within a few days of birth. During the first week of life, they will eat very little grain, but by the second week they should be eating noticeable amounts. Calves should be eating 1.5 to 2 pounds of grain per day by the time they are weaned.

Management of dry feed and weaning includes the following:

A. Quality Calf Starter
B. Feeding Calf Starter
C. Feeding Water
D. Weaning Healthy Calves

** WEANING ACTION PLAN

CHORE OUTCOMES:

<table>
<thead>
<tr>
<th>IF YOU DO</th>
<th>IF YOU DON’T</th>
</tr>
</thead>
<tbody>
<tr>
<td>5A. Quality calf starter</td>
<td>5A. Quality calf starter</td>
</tr>
<tr>
<td>• Required nutrients provided.</td>
<td>• Undernourished calves.</td>
</tr>
<tr>
<td>• Increased feed intake.</td>
<td>• Decreased feed intake.</td>
</tr>
<tr>
<td>5B. Feeding calf starter</td>
<td>5B. Feeding calf starter</td>
</tr>
<tr>
<td>• Required nutrients provided.</td>
<td>• Undernourished calves.</td>
</tr>
<tr>
<td>• Improved growth.</td>
<td>• Reduced growth.</td>
</tr>
<tr>
<td>• Rumen development stimulated.</td>
<td>• Limited rumen development.</td>
</tr>
<tr>
<td>• Calves weaned at younger age.</td>
<td>• Calves weaned at older age.</td>
</tr>
<tr>
<td>5C. Feeding water</td>
<td>5C. Feeding water</td>
</tr>
<tr>
<td>• Rumen fermentation started.</td>
<td>• Rumen development slowed.</td>
</tr>
<tr>
<td>• Increased starter intake.</td>
<td>• Reduced starter intake.</td>
</tr>
<tr>
<td>5D. Weaning healthy calves</td>
<td>5D. Weaning healthy calves</td>
</tr>
<tr>
<td>• Calves switched to less-intensive management.</td>
<td>• Economic loss due to intensive labor requirements.</td>
</tr>
<tr>
<td>• Adequate rumen development allows continued growth and good health.</td>
<td>• Weight loss and illness.</td>
</tr>
</tbody>
</table>

Weaning Action Plan is included as an example flow diagram showing the steps of the weaning process.

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Quality Calf Starter

Skills Needed: Ability to read and understand labels and knowledge of basic calf nutrition.

Equipment Needed: Calf starter feed label.

Time Required: 3 minutes.

WHY? Calf starter provides protein, energy, and minerals needed to grow and maintain good health. High-quality calf starter will improve grain intake and growth and prepare calves for early weaning.

HOW?

Step 1. Look at the label: The label will list nutrients and ingredients in the feed. Good calf starter contains 16 to 22% protein on an as-fed basis and a coccidiostat or an ionophore (medications to control coccidiosis). Starters with a coccidiostat or an ionophore will be marked medicated on the label.

Step 2. Look at the feed: Calf starter could be a textured grain mix or a pelleted feed. Textured mixes should contain coarse-textured corn, small grains, and pellets fortified with protein, minerals, and vitamins. Molasses may be mixed in the pellet or throughout the mixture. Sweeteners and flavoring agents may be added to improve taste.

Step 3. Look for fines: Excessive fines or dust at the bottom of bags or feed pails indicates poor quality pellets and will reduce palatability. Good quality starter will have few fines.

Step 4. Feel the feed: Calf starter should not be caked or wet. It should not be dry, dusty, or overly crumbly, and should not contain fine particles.

Step 5. Smell the feed: The calf starter should have a sweet, pleasant odor, not a moldy or rancid smell. High-moisture grains are not recommended because they mold quickly. To keep starter fresh, do not store beyond 2 months.

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Feeding Calf Starter

Skills Needed: Consistency, attention to individual calves, and knowledge of basic calf nutrition.

Equipment Needed: Calf starter, measuring container, feed bucket or bunk, scale, record book.

Time Required: Several minutes per calf.

WHY? Under current feeding practices, milk alone does not provide enough nutrients for adequate growth and health. Grain provides additional nutrients and stimulates rumen development that allows smooth transition to dry feed diets.

HOW?

Step 1. Feed calf starter containing 16 to 22% protein as fed.
Step 2. Make sure calf starter is fresh and of good quality (see Chore Plan 5A).
Step 3. Feed buckets or bunks should be dry and free of moldy or spoiled feed.
Step 4. Begin feeding starter at 3 days of age. Feed only a small handful at each feeding until the calf begins to eat starter. Gradually increase the amount fed.
Step 5. Place enough calf starter in a clean bucket or bunk so calves eat all but a small amount by the next feeding. Calves should never run out of starter.
Step 6. At each feeding remove any wet, spoiled, or stale grain before feeding more.
Step 7. Once a week, measure the amount of starter given to each calf. The following day, weigh any leftover feed to determine roughly the amount each calf eats daily. Record this amount.
Step 8. Calves should eat 1.5 to 2.0 lb of starter per day for at least 3 days before weaning.

Questions? Please see the herd manager. Thank you, and keep up the good work!
Feeding Water

Skills Needed: Attention to detail and a basic understanding of calf nutrition.

Equipment Needed: Fresh water supply, buckets.

Time Required: Several minutes per calf.

WHY? Water plays a role in almost every bodily function. It is the most important nutrient. Water encourages starter intake and rumen development and improves calf health and growth.

HOW?

Step 1. Offer clean, fresh water to calves by 2 days of age. By 1 week, calves should drink noticeable amounts of water each day.

Step 2. Check water at each feeding for contamination by feed or manure. Dump any dirty water, clean the bucket and refill with fresh water.

Step 3. Empty water buckets at least once daily, and refill with fresh water. Calves should never run out of water.

Step 4. Keeping fresh water available in the winter in cold climates may be difficult; however, it is still important to have it available at least 2 times per day. Use warm water to help prevent freezing.

Step 5. By 1 month, calves should drink 1.3 to 2 gallons of water daily. By 2 months, they should drink 1.5 to 2.4 gallons daily.

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Weaning Healthy Calves

Skills Needed: Knowledge of basic calf nutrition, attention to individual calves, and ability to read and interpret calf record book.

Equipment Needed: Calf records.

Time Required: Varies for each calf.

WHY? Calves are often weaned at a young age to minimize the costs of feed and labor. However, calves must have adequate rumen development before weaning to avoid weight loss and health problems after weaning.

HOW?

Step 1. Successful weaning requires:
   - **Age**: Calves must be at least 4 weeks old.
   - **Grain Intake**: Calves must eat 1.5 to 2.0 lb daily for 3 consecutive days.
   - **Good Health**: Calves must be healthy.

Step 2. When calves meet these criteria, stop feeding milk either abruptly or gradually.

Step 3. Be sure to provide additional fresh starter grain and water when milk is discontinued.

Step 4. Leave calves in the same housing for another week before moving.

Step 5. **Do not add more stress** by dehorning, removing extra teats, vaccinating, or changing the diet at this time. Spread these management chores out over a period of time after weaning.

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Weaning Action Plan

Gather calf records. You must know birthdate, daily starter intake, and health status.

4 weeks old?

Yes

Healthy?

Yes

1.5 lb grain 3 days in a row?

Yes

Stop feeding milk.

No

No

Do not wean. Continue milk feeding.
**INTRODUCTION:** The comfort of calves is essential to reducing stress. Housing, bedding, ventilation, weather, and handling all affect health and well-being. Efforts to make calves comfortable pay off in improved growth rates and reduced health costs.

Calf comfort chores include:

- A. Housing Evaluation
- B. Evaluating Temperature and Humidity
- C. Bedding Maintenance
- D. Handling and Restraint

**CHORE OUTCOMES:**

<table>
<thead>
<tr>
<th></th>
<th>IF YOU DO</th>
<th>IF YOU DON’T</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6A. Housing evaluation</strong></td>
<td>• Increased health and growth.</td>
<td>• Poor health and growth.</td>
</tr>
<tr>
<td></td>
<td>• Reduced stress.</td>
<td>• Increased stress.</td>
</tr>
<tr>
<td></td>
<td>• Improved ease of feeding and care.</td>
<td>• Difficult feeding and care.</td>
</tr>
<tr>
<td></td>
<td>• Chores completed efficiently.</td>
<td>• Inefficient use of time and labor.</td>
</tr>
<tr>
<td><strong>6B. Evaluating temperature and humidity</strong></td>
<td>• Increased health and growth.</td>
<td>• Poor health and growth.</td>
</tr>
<tr>
<td></td>
<td>• Reduced stress.</td>
<td>• Increased stress.</td>
</tr>
<tr>
<td><strong>6B. Bedding maintenance</strong></td>
<td>• Comfortable, dry environment.</td>
<td>• Uncomfortable, damp environment.</td>
</tr>
<tr>
<td></td>
<td>• Clean, dry calves.</td>
<td>• Dirty, wet calves.</td>
</tr>
<tr>
<td></td>
<td>• Reduced risk of health problems and death.</td>
<td>• Greater risk of health problems and death.</td>
</tr>
<tr>
<td><strong>6C. Handling and restraint</strong></td>
<td>• Reduced injury to calves and people.</td>
<td>• Increased injury to calves and people.</td>
</tr>
<tr>
<td></td>
<td>• Docile behavior encouraged.</td>
<td>• Aggressive behavior encouraged.</td>
</tr>
<tr>
<td></td>
<td>• Stress avoided.</td>
<td>• Stressed calves.</td>
</tr>
</tbody>
</table>

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Housing Evaluation

Skills Needed: Ability to observe calves and sensitivity to environment.

Equipment Needed: Well-planned calf housing system.

Time Required: 30 minutes to 1 hour.

WHY? Proper housing provides a healthy environment for calves. There are four keys to housing design: ventilation, isolation, comfort, and economy.

HOW?

Ventilation: Proper ventilation improves calf health.

Step 1. Kneel in the calf living environment to test the air about 6 inches above the bedding.

Step 2. Can you feel fresh air movement? If no, open windows, doors, or vents.

Step 3. Do you notice any odors (ammonia, sour, etc.)? If yes, open windows, doors, and vents; turn on fans; and/or clean out old bedding.

Step 4. Do you feel drafts in resting areas? If yes, block these openings during cold weather.

Isolation: Isolation reduces disease transfer between calves.

Step 5. Are calves housed so they cannot touch or lick each other? If solid partitions are used, pay close attention to ventilation.

Step 6. Do caretakers practice personal cleanliness when caring for calves? This limits the spread of organisms from calf to calf.
**Comfort:** Comfort keeps calves healthy and stress free.

**Step 7.** Is the calf area well drained and free of moisture? If no, why?

**Step 8.** Kneel for 2 minutes. Are your knees damp? If yes, then add clean bedding or remove old bedding and replace it.

**Step 9.** Do calves have free-choice access to fresh feed and water? If no, provide it.

**Economy:** Housing should be cost effective to build and maintain, time efficient for general calf care, and labor efficient with access to calves for observation and chores.

**Step 10.** Does calf housing allow timely, efficient completion of chores? If no, make changes to improve labor efficiency.

**Step 11.** Do you have any ideas for improvement?

**Questions? Please see the herd manager.**

**Thank you, and keep up the good work!**
Evaluating Temperature and Humidity

Skills Needed: Attention to detail, sensitivity to the environment.

Equipment Needed: Calf housing, min-max thermometer, humidity monitor.

Time Required: Less than 1 minute.

WHY? Extremes of both heat and cold can reduce calf growth and contribute to greater rates of sickness. Responding as needed to changes in the calf environment will help improve the consistency of calf health and growth. Humidity increases air temperature, and can increase stress in warmer weather.

HOW?

Step 1. Monitor temperature and humidity inside calf housing daily.

Cold stress: increase amount of feed offered by 2 to 5% and be sure the resting area is dry and draft-free.

Heat stress: be sure plenty of fresh water is available and increase air flow.

Step 2. The table below shows the range of temperatures that are stress free for young calves. When temperatures inside calf housing are outside this range, changes are needed to improve their comfort.

<table>
<thead>
<tr>
<th>Age</th>
<th>Most Comfortable Range</th>
<th>Cold Stress at Temps Below</th>
<th>Heat Stress at Temps Above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 mo</td>
<td>55 to 70 °F</td>
<td>50 °F</td>
<td>77 °F</td>
</tr>
<tr>
<td>1 mo to weaning</td>
<td>46 to 80 °F</td>
<td>28 °F</td>
<td>84 °F</td>
</tr>
</tbody>
</table>

Step 3. Relative humidity in the range of 50 to 70% is preferred inside calf housing.

Step 4. Compare the temperature inside and outside the calf housing. When the system is working properly, the temperature inside naturally ventilated housing is no more than 10 to 15°F warmer than the outside temperature.

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Bedding Maintenance

Skills Needed: Ability to observe living environment and ability to shovel or fork bedding.

Equipment Needed: Clean dry bedding (straw, sawdust, shavings), hydrated lime, bedding fork or shovel.

Time Required: 5 to 10 minutes per calf.

WHY? A clean, dry living environment is essential for the health and growth of dairy calves. Along with good drainage and ventilation, proper bedding plays an important part in keeping calves dry and comfortable.

HOW?

Step 1. Before applying bedding, make sure housing is well drained, ventilated, isolated, and free from drafts (see Chore Plan 6A).

Step 2. Before applying bedding, disinfect the entire area and allow it to dry (see Chore Plan 4C).

Step 3. After disinfectant dries, sprinkle hydrated lime over entire area. Apply at a rate of about 1 pound per pen (4 by 8 foot area).

Step 4. Add at least 4 inches of bedding (6 to 10 inches is better). Bedding should be deep enough to allow you to drop to your knees without pain.

Step 5. Inspect bedding daily (while feeding). Bedding should be dry enough that after kneeling for at least one minute, your knees are dry. Clean or top-dress with fresh bedding as needed to keep the area dry.

- If daily top-dressing keeps the bedding back dry, the environment should not need a full cleaning until the calf is weaned and removed to group housing.

Questions? Please see the herd manager. Thank you, and keep up the good work!
Handling and Restraint

**Skills Needed:** Patience, calm manner, ability to work with calves, and ability to lift 100 pounds of live weight.

**Equipment Needed:** Halter, headlock, sturdy post or gate, clean floor surface, well-lit area.

**Time Required:** Several minutes per calf.

**WHY?** Animals have long memories. If calves experience stress during handling, they will experience stress when handled later in life. Chronic stress reduces growth and immunity.

**HOW?**

- **Step 1.** Avoid shouting and loud noises. Speak softly and touch calves gently during handling. Frequent gentle contact with people will allow calves to adapt to handling and reduce stress levels.
- **Step 2.** Do not hit calves with your hands or any other objects.
- **Step 3.** Do not grab or pull calves using the ears as handles.
- **Step 4.** The appropriate restraint method depends on the reason for restraint, the experience of the operator, and the calf’s level of stress.
  - **Back calf into corner:** This method is used when little restraint is needed, but the calf’s position must be somewhat controlled. Back calf into a corner of the pen and stand beside it. Straddling the calf may work for smaller calves. Do not stand in front of the calf. Use of an esophageal feeder, balling gun, or oral vaccination may be safely accomplished with little stress using this method.
  - **Halter or Headlock:** This method is used when the procedure requires a standing calf or tight restraint. Correct placement of a halter is achieved when the nosepiece rests midway between the nose and eyes. Sidepieces should not hit the calf’s eyes. Adjust the halter to fit snugly. Once haltered, the calf can be held by an assistant or tied securely to a post or gate. If headlocks are used, they should be sized appropriately for young calves and should include a release that prevents choking. Halters and headlocks are useful when dehorning or administering injections.
• **Lay calf on floor:** This method is used when removing extra teats or performing some surgeries (such as navel hernias). Stand close to the calf’s barrel. Reach over the back and grasp the flank and the front leg close to the calf’s body. Lift the calf toward your body, and gently lower the calf to the floor. Be sure the floor surface is clean and well bedded.

Questions? Please see the herd manager. 
Thank you, and keep up the good work!
CALF HEALTH:

INTRODUCTION: The overall health of the calf is the sum of the immunity it receives from colostrum and the sanitation of the calf’s birth and living environments. A good health program simply monitors calf health and responds to any changes in it.

Successfully managing calf health includes the following chores:

A. Environmental Assessment
B. Daily Health Checks
** HEALTH ACTION PLAN
C. Identification of Calf Scours
D. Identification of Calf Respiratory Disease
E. Evaluation of General Appearance
F. Taking Calf’s Temperature
G. Measuring Respiration Rate
H. Measuring Heart Rate
I. Dehydration
J. Drawing a Blood Sample
K. Giving Injections
L. Giving Intranasal Vaccinations
M. Vaccine Handling
N. Dehorning
O. Extra Teat Removal
P. Call the Veterinarian

CHORE OUTCOMES:

<table>
<thead>
<tr>
<th>IF YOU DO</th>
<th>IF YOU DON’T</th>
</tr>
</thead>
<tbody>
<tr>
<td>7A. Environmental assessment</td>
<td></td>
</tr>
<tr>
<td>• Problems identified.</td>
<td>• Unidentified problems.</td>
</tr>
<tr>
<td>• Solutions suggested.</td>
<td>• No attempts to improve environment.</td>
</tr>
<tr>
<td>• Improved health, growth, &amp; comfort.</td>
<td>• Health, growth, and comfort limited.</td>
</tr>
<tr>
<td>7B. Daily health checks</td>
<td></td>
</tr>
<tr>
<td>• Sick calves identified earlier.</td>
<td>• Sick calves missed.</td>
</tr>
<tr>
<td>• Health history for each calf maintained.</td>
<td>• No record of calf health.</td>
</tr>
<tr>
<td>• Reduced veterinary costs.</td>
<td>• Increased costs for treatment.</td>
</tr>
<tr>
<td>• Growth and death losses lowered by preventative measures.</td>
<td>• Growth and death losses possibly increased.</td>
</tr>
</tbody>
</table>
**Health Action Plan** included as an example of a protocol for identifying and treating sick calves. It could be useful as a starting point for developing a plan customized to your farm.

### 7C. Identification of calf scours
- Dehydrated calves identified.
- Early treatment.
- Reduced death & economic losses.
- Scouring calves dehydrated & weak.
- No treatment and spread of disease.
- Increased death and economic losses.

### 7D. Identification of calf respiratory disease
- Calves with respiratory problems identified.
- Early treatment limits infection.
- Reduced death & economic losses.
- Unidentified infections permanently damage lungs, spread to other calves.
- Increased treatment costs.
- Increased death and economic losses.

### 7E. Evaluation of general appearance
- Early identification of sick calves.
- Increased economic loss.

### 7F. Taking calf’s temperature
- Sick calves detected earlier.
- Health records maintained.
- Unidentified sick calves.
- No health records.

### 7G. Measuring respiratory rate
- Sick calves detected earlier.
- Early treatment increases chance of success.
- Sick calves not identified.
- Delayed treatment, risk permanent damage.

### 7H. Measuring heart rate
- Another tool to identify sick calves early.
- Calves with slight illness not identified until symptoms are worse.

### 7I. Dehydration
- Lost fluids replaced.
- Reduced death rate.
- Rapid fluid loss and death.
- Weak calves and high death rate.

### 7J. Drawing a blood sample
- Blood used to evaluate calf health.
- Blood concentrations of important indicators of calf health unknown.

### 7K. Giving injections
- Protected from disease.
- Improved growth and health.
- Unprotected from disease.
- Reduced health and growth.

### 7L. Giving intranasal vaccinations
- Local protection from disease in respiratory tract.
- Reduced local protection in respiratory tract.

### 7M. Vaccine handling
- Vaccine viability maintained.
- Injection sites healthy.
- Reduced spread of disease.
- Vaccine effectiveness ruined.
- Injection site infected.
- Disease spread through herd.

### 7N. Dehorning
- Calves and people protected from dangerous horns.
- Less aggressive “boss” cows.
- Easier handling.
- Calves and people injured.
- More dangerous “boss” cows.
- More difficult handling.

### 7O. Extra teat removal
- Improved udder appearance.
- Prevent later infections.
- Teat cup placement unaffected.
- Detracts from udder appearance.
- Increased risk of infection.
- Interference with teat cup placement.

### 7P. Call the veterinarian
- Early treatment and faster recovery.
- Increased death and economic loss.
Environmental Assessment

Skills Needed: Ability to observe living environment.

Equipment Needed: None.

Time Required: minimal.

WHY? Calf health largely depends on environment. Caretakers must make sure the calves’ living environment remains a healthy place. A clean, dry environment is the best way to prevent health problems.

HOW?

Step 1. Use your eyes: Check maternity pens, calving areas, and individual calf housing to make sure they are clean, dry, and draft free.

Step 2. Use your nose: Smell the air. Does it smell fresh? Are there sour or unpleasant odors indicating scours, moldy feed, fermenting manure, or ammonia?

Step 3. Feel the air: Can you feel air movement around and through the calf area? If the air seems still and heavy, increase ventilation (see Chore Plan 6A).

Step 4. Use your ears: Does the calf area sound normal? Are calves responding at feeding time? Are they quiet and content shortly after feeding and while resting? Are any calves coughing?

Step 5. Ask yourself, “Would I like to live in this environment?”

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Daily Health Checks

Skills Needed: Ability to observe calf and record information.

Equipment Needed: Health check sheets, Calf Track™ scoring system.

Time Required: minimal.

WHY? Daily health checks are conducted to ensure the health and comfort of all calves. These checks serve as a means of calf evaluation, record keeping, and overall health management. Health checks also can be used as veterinary and management diagnostic tools.

HOW?

Step 1. Often the first sign of illness is loss of appetite. Be alert for calves that drink more slowly than normal, play with milk rather than drink it, lie down immediately after drinking, refuse to drink, or act listless at feeding time.

Step 2. Use your eyes: The calf should fit this description:
- Clear, bright eyes - not sunken, watery, or glazed.
- Slightly erect ears that are turned forward - not droopy or turned down.
- Moist nose - no mucus, not runny, not dry.
- Slow and even breathing - not rapid, panting, or labored.
- Shiny coat that is smooth to slightly curly - not flaky, patchy, or brittle.
- Sweet to slightly sour breath - not rancid or curdled.
- Dry and comfortable - not cold and shivering.
- Stretches when rising and remains stable when standing.
- Eats vigorously and suckles for more.

Step 3. Use your nose: Smell the air. Is it fresh? Are there sour or unpleasant odors indicating scours or other health problems?

Step 4. Use your ears: Does the calf area sound normal? Are calves responding at feeding time? Are they quiet and content shortly after feeding and while resting? Are any calves coughing?

Step 5. Be sensitive to each calf!

Questions? Please see the herd manager. Thank you, and keep up the good work!
Complete Daily Health Check
Record score for each category and overall

Total score?
1 or 2
Stop
3 to 5
Flag calf for closer examination.

Health Action Plan

Check Temperature
Below 101°F
No treatment
101 to 103°F
No treatment
Above 103°F
Fever Reducer

Check Respiratory Rate
Below 24
No treatment
24 to 36
No treatment
Above 36
Antibiotics

Check Heart Rate
Below 100
Antibiotics
100 to 140
No treatment
Above 140

Skin does not tent
No treatment

Skin tents 2 to 6 seconds
Oral Electrolytes

Skin tents more than 6 seconds
Intravenous Electrolytes

Heat Lamp or Blanket
Below 101°F
No treatment
101 to 103°F
No treatment
Above 103°F
Fever Reducer
Identification of Calf Scours

Skills Needed: Careful observation, attention to individual calves, ability to identify scouring calves, and ability to provide necessary treatments.

Equipment Needed: Calf Track™ scoring system and health sheets, pen or pencil.

Time Required: minimal.

WHY? Calf scours is the most common cause of death in young calves. Early identification and treatment increases survival rates.

HOW?

Step 1. Observe each calf carefully while conducting the daily health check.

Step 2. Evaluate fecal material in the pen and/or on the calf.

Step 3. Consistency: Fecal consistency ranges from firm to watery:
- Firm to soft = normal, holds shape
- Soft to loose = like pudding, forms flat pile
- Loose to watery = like pancake batter, splatters
- Watery = like muddy water, absorbed by sawdust (may be a wet spot)
Step 4. **Color:** Fecal color ranges greatly. Common colors are brown, light brown, yellow, green, white, and clear (typically seen with watery consistency). Combinations or variations of these colors are also common.

Step 5. **Contaminants:** The presence of blood or mucus often indicates illness.

Step 6. **Odor:** Fecal odor increases as severity of scours increases. The quality of the odor also changes as organisms produce different gases or decay. (It smells more, and it smells worse.)

Step 7. Score each calf on the Calf Track™ scoring sheets based on your observations.

Step 8. Follow the Health Action Plan to determine what treatments (if any) the calf should receive.

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Identification of Calf Respiratory Disease

Skills Needed: Careful observation, attention to individual calves, ability to identify sick calves, and ability to provide necessary treatments.

Equipment Needed: Calf Track™ scoring system and health sheets, pen or pencil.

Time Required: minimal.

WHY? Respiratory disease is the second-leading cause of death for young calves. Affected calves can suffer permanent lung damage that results in chronic poor performance and culling. Early identification and treatment are essential to reduce treatment costs and improve survival rates.

HOW?

Step 1. Observe each calf carefully while conducting the daily health check.

Step 2. Listen for coughing or other abnormal noises. Listen carefully to the calf’s breathing and look closely at the nose and eyes.

Step 3. Coughing: Healthy calves do not cough. However, they occasionally make small noises similar to a cough or snort (especially after eating). If you hear a cough, listen to determine the frequency. Also, listen for the intensity of the cough. Deep, hacking coughs indicate severe infection.

Step 4. Breathing: Listen to the frequency and the depth of breathing. Normal breathing is relatively slow, with evenly spaced and relatively deep breaths. Rapid, irregular, labored, and/or shallow breathing indicates infection.

Step 5. Nose: Healthy calves have moist noses. A runny nose (watery, clear mucus) or thick, yellow mucus discharge indicate infection. Extreme dryness may indicate dehydration.

Step 6. Eyes: Healthy calves have bright, dry eyes. Watery or rolling eyes indicate infection.

Step 7. Score each calf on the Calf Track™ scoring sheets based on your observations.

Step 8. If the calf exhibits any abnormal behaviors listed above, check her temperature (see Chore Plan 7F). If the lungs are infected a fever (body temperature above 103°F) is common.

Step 9. Follow the Health Action Plan to determine what treatments (if any) the calf should receive.

Questions? Please see the herd manager. Thank you, and keep up the good work!
Evaluation of General Appearance

Skills Needed: Careful observation, attention to individual calves, ability to identify unthriftty calves, and ability to provide necessary treatments.

Equipment Needed: Calf Track™ scoring system and health sheets, pen or pencil.

Time Required: minimal.

WHY? General appearance indicates health. Careful observation of each calf’s behaviors and mannerisms allows early identification of illnesses and improves the chance of successfully treating health problems.

HOW?

Step 1. Observe each calf carefully while conducting the daily health check.

Step 2. Eyes: Healthy calves have bright eyes. Dull, sunken, or otherwise abnormal eyes indicate illness.

Step 3. Ears: Healthy calves hold their ears erect, pointed slightly forward. Droopy ears may indicate illness.

Step 4. Activity: Healthy calves are active, especially at feeding time. Sluggish or lethargic behavior indicates illness.

Step 5. Ability to Stand: Healthy calves stand up and are eager to eat at feeding time. Calves that do not stand or show no interest in eating are sick.

Step 6. Score each calf on the Calf Track™ scoring sheets based on your observations.

Step 7. Follow the Health Action Plan to determine what treatments (if any) the calf should receive.

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Taking Calf’s Temperature

Skills Needed: Ability to restrain calf and ability to use a rectal thermometer.

Equipment Needed: Animal rectal thermometer, halter, lubricant (such as petroleum jelly), paper towel, record book.

Time Required: 4 to 5 minutes per calf.

WHY? The rectal temperature of calves is relatively constant and is an indicator of general health that allows early detection of illness. For calves less than 1 month of age, normal body temperature is 102°F, with a range of 101 to 103°F. After 1 month, the normal range is 100 to 102°F.

HOW?

Step 1. Quietly catch and halter calf (see Chore Plan 6D).
Step 2. Tie calf securely to a post, gate, or stock panel.
Step 3. Grasp the thermometer firmly (end without the bulb) with your thumb and first two fingers.
Step 4. Mercury thermometers: Tie a string to the end of the thermometer (to retrieve it if necessary). Hold the thermometer away from your body and snap downward to move mercury down.
Step 5. Lubricate the bulb end of the thermometer.
Step 6. Slowly approach the calf, talking softly. Gently pat the calf and place one hand on the calf’s hip. With the other hand, gently place the bulb end of the thermometer on the anus of the calf.
Step 7. Gently turn the thermometer, adding slight pressure as you push the thermometer through the anus and into the rectum.
Step 8. Push the full length of the thermometer into the rectum (mercury thermometers: leave about 1 inch outside the rectum). Thermometer must touch one side of the rectum to read an accurate temperature.
Step 9. Allow the thermometer to remain in the rectum for 1 to 2 minutes.
**Step 10.** Read the temperature.

*Mercury thermometers:*
1. Withdraw thermometer slowly and clean with a paper towel.
2. Rotate thermometer until mercury can be seen next to degree graduations.
3. Look for the top of the mercury column and determine which degree graduation mark is nearest to the top of it.

*Digital thermometers:*
1. Before removing the thermometer, press the button to store the recorded temperature (optional feature) or read the temperature.
2. Withdraw the thermometer slowly and clean with a paper towel.

**Step 11.** Determine whether rectal temperature is normal or abnormal. If abnormal, consider a calf blanket or medicine to reduce a fever. Work with your veterinarian to determine treatment strategies for calves.

**Normal body temperature**
- Calves less than 1 month of age: 101 to 103°F
- Calves more than 1 month of age: 100 to 102°F

**Step 12.** Record temperature and release calf.

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**Questions? Please see the herd manager.**

*Thank you, and keep up the good work!*
Measuring Respiratory Rate

Skills Needed: Careful observation and attention to individual calves.

Equipment Needed: Watch or timer that can measure 1 minute intervals.

Time Required: 1 minute per calf.

WHY? Sick calves often have an increased respiratory rate. Calves near death may have a very slow respiratory rate. Paying attention to respiratory rates can help identify calves with respiratory illness early, when treatments may be more successful.

HOW?

Step 1. Identify calves that should be inspected more closely during daily health check (see Chore Plan 7B).

Step 2. Stand back from the calf and watch it while it is standing or lying calmly.

Step 3. Watch the rise and fall of the ribs as the calf breathes in and out.

Step 4. Count the number of breaths (one inspiration and one expiration) in 1 minute.

Normal respiration rate (breaths per minute)

- Calves less than 1 month of age: average 30, range of 24 to 36
- Calves more than 1 month of age: range 15 to 30

Step 5. Observe the rhythm of breathing. Normally, the inhale and exhale are about the same length, sometimes the inhalation lasts a little bit longer. Breathing is more uneven in calves that are ill.

Step 6. Observe the depth of breathing. Normally, the rise and fall of the ribs is barely noticeable and there is no sound. If you can obviously see or hear either inhalation or exhalation, the calf is struggling to breathe.

Step 7. Note any calves that have higher than normal respiration rates or exhibit signs of difficult breathing. Consider antibiotic treatment for these calves. Work with your veterinarian to develop a protocol for treating calves with respiratory illnesses.

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Measuring Heart Rate

Skills Needed: Careful observation and attention to individual calves.

Equipment Needed: Watch or timer that can measure 1 minute intervals.

Time Required: 1 minute per calf.

WHY? Sick calves often have a weak or irregular heart rate. Measuring the heart rate of calves that are slightly “off” will help you catch illnesses early, when treatment is most effective.

HOW?

Step 1. Identify calves that should be inspected more closely during daily health check (see Chore Plan 7B).

Step 2. There are several ways to measure a calf’s heart rate (or pulse).

Place two or three fingers over an artery – two arteries with easy access are under the tail and at the base of the jaw.

Use a stethoscope to listen to the heart – place the stethoscope just behind the point of the calf’s elbow.

Step 3. Count the number of beats in 1 minute.

Normal heart rate (beats per minute)
Calves less than 1 month of age: average 120, range of 100 to 140
Calves more than 1 month of age: range 60 to 80

Step 4. Observe the rhythm and strength of the pulse. Healthy calves have a strong, steady pulse. Sick calves tend to have a weak or irregular pulse.

Step 5. Note any calves that have abnormal heart rates or weak pulse. Consider other symptoms, and work with your veterinarian to develop a protocol for treating sick calves.

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Dehydration

Skills Needed: Careful observation, attention to individual calves, and ability to identify signs of dehydration.

Equipment Needed: Nipple bottle or pail, esophageal feeder, electrolyte solution.

Time Required: 5 to 10 minutes per calf.

WHY? Scouring calves may lose 10 percent of their body weight in a single day. Dehydration, not microorganisms, typically kills these calves. Early identification and treatment of dehydrated calves increase survival rates.

HOW?

Step 1. Determine calves at risk of dehydration during daily health check (see Chore Plan 7B).

Step 2. Inspect calves closely for signs of dehydration (sunken eyes, dry mouth and nose, weight loss, fast or slow pulse, cold ears and legs).

Step 3. Check skin tenting on every calf with a fecal score of 3 or more. Firmly pinch the loose folds of skin on the neck.
  - If the skin remains tented for 2 to 6 seconds after the pinch is released, the calf is moderately dehydrated.
  - Longer tenting (more than 6 seconds) indicates severe dehydration.

Step 4. If skin does not tent, continue to watch calf carefully for a day or two.

Step 5. Feed moderately dehydrated calves 2 quarts of commercial electrolyte solution, mixed according to manufacturer’s directions. An additional feeding at midday is recommended. Continue to feed dehydrated calves milk, but be sure to wait at least 30 minutes after milk feeding before offering electrolytes. Do not mix electrolytes with milk or milk replacer.

Step 6. Feed electrolytes by nipple bottle or pail unless calf refuses to suckle. Calves that will not suckle can be fed using an esophageal feeder (see Chore Plan 2I).

Step 7. Work with your veterinarian to develop a protocol for treating severely dehydrated calves.

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Drawing a Blood Sample

Skills Needed: Basic knowledge of anatomy and ability to restrain calf.

Equipment Needed: Small syringe, 18-gauge, 1-inch needle, test tube (or vacutainer and vacutainer needle).

Time Required: 5 minutes per calf.

WHY? Concentrations of some blood components are useful in evaluating calf health. Proper sampling technique is required to minimize stress on calves and to ensure quality blood samples.

HOW?

Step 1. Label a test tube or vacutainer with the calf’s identification number and the date. Assemble the syringe and needle (or vacutainer).

Step 2. Restrain the calf. In pens, back the calf into a corner and use your body to pin it against the wall. In hutches, halter the calf and tie it to a post or gate panel and/or use your body to pin the calf against the hutch.

Step 3. Hold the calf’s head to one side (push it away from your body) to access the jugular vein. Use the elbow and upper part of your arm to keep your hand free (you will need it to draw blood).

Step 4. Remove the needle guard.

Step 5. Using the hand that is not holding the calf’s head, locate the groove running from the brisket to the base of the jaw, where the jugular vein usually rests.

Step 6. Place 2 or 3 fingers over the groove (making a bridge) and apply pressure to the jugular vein just above the point of the shoulder.

Step 7. After a few seconds, the vein should fill with blood and become easily visible. If it does not, repeat steps 5 and 6 until you locate the jugular vein.

Step 8. Once you can see the vein, insert the needle into it using the hand that is also holding the calf’s head. The insertion should be at a moderate angle, not perpendicular, but close to it.

Step 9. Be sure to keep pressure on the jugular vein with your other hand.
Step 10. *Needle and syringe:* Pull back on the plunger and draw 2 to 3 ml of blood into the syringe and then pull the needle straight out.

*Vacutainer:* Once needle is inserted blood will begin to flow into the tube. When tube is about three-quarters full, remove the needle by pulling it straight out.

Step 11. If blood is not drawn into the syringe or vacutainer, pull the needle out a little (you may have passed the vein). Only move the needle straight in or out to avoid injuring surrounding tissue.

- If you miss the vein, pull out the needle and try again (repeat steps 1 through 9). Replace the needle after two attempts on one calf (never use the same needle for multiple animals).

Step 12. Release the calf.

Step 13. *Needle and syringe:* Transfer blood from syringe to a labeled test tube. Cap and remove the needle. Touch the tip of the syringe to the side of the test tube and slowly depress the plunger.

Step 14. Follow proper disposal procedures (needles in a “sharps” container and blood-contaminated materials labeled bio-hazard).

Step 15. Process the blood as needed for the specific test you are conducting (see chart below). Some tests may require placing the sample on ice immediately; consult a veterinarian for details.

<table>
<thead>
<tr>
<th>Sample Needed</th>
<th>Collection and Processing Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Blood</td>
<td>None (Vacutainer with purple or green cap)</td>
</tr>
<tr>
<td>Serum</td>
<td>Allow blood to clot Separation (let it sit or centrifuge) (Vacutainer with red cap)</td>
</tr>
<tr>
<td>Plasma</td>
<td>Do not allow clotting, use anticoagulant Separation (let it sit or centrifuge) (Vacutainer with purple cap)</td>
</tr>
</tbody>
</table>

Questions? Please see the herd manager.

Thank you, and keep up the good work!
Giving Injections

Skills Needed: Ability to restrain calf, ability to read and follow instructions, and basic knowledge of calf anatomy.

Equipment Needed: 10-cc syringe, 18-gauge needle, sterile alcohol pads (or isopropyl alcohol and a paper towel or cotton balls), medication.

Time Required: 1 to 5 minutes per calf.

WHY? Vaccinations or other medications are needed to protect calves from attacks by infectious organisms. All injections should be given at the direction of a veterinarian.

HOW?

Step 1. Thoroughly read and understand the directions that come with medications and/or directions from the veterinarian. Pay close attention to the dose and route of administration. If you have questions, do not guess! Stop what you are doing and ask for help.

Step 2. Quietly catch and halter calf (see Chore Plan 6D).

Step 3. Tie calf securely to a post, gate, or stock panel.

Step 4. Remove alcohol swab from wrapper, or saturate paper towel or cotton ball with isopropyl alcohol to make an alcohol swab.

Step 5. Locate sterile syringe and needle and remove needle guard.

Step 6. Locate medication or vaccine. Some will be liquid, others are dried powders that must be reconstituted before being injected.

Follow manufacturer’s directions to reconstitute powdered medications.

- Reconstitute product just before using it to ensure viability.
- Use only the diluent (liquid powder is dissolved into) supplied by the manufacturer.
- Inject diluent into dried product and shake to mix thoroughly.
- Draw the correct dose of reconstituted product into the syringe and continue with Step 11.

Step 7. Using alcohol swab, wipe off the rubber stopper of medicine bottle.

Step 8. Pull plunger on syringe back to the end of cc graduations (markings).

Step 9. Push the needle through the rubber stopper of the bottle.

Step 10. Turn bottle upside down and push in plunger. This forces air into the bottle and creates backpressure that forces medication into the syringe.
Step 11. Slowly pull the plunger back, drawing medication into the syringe. Slightly overfill the correct dose. Tap the barrel of the syringe to make sure air bubbles rise toward needle. Slowly press plunger to push air bubbles and excess medication back into the bottle. Medication in the syringe should now be the dose indicated in the directions. If not, repeat steps 6 through 10.

Step 12. Grasp the barrel of the syringe and remove it from the bottle.

Step 13. Slowly approach the calf, talking softly. Gently pat the calf and place one hand on her. Locate the injection site with the other hand.

Subcutaneous injection site: under the loose skin on the neck.

Intramuscular injection site: into the long muscle of the neck.

Step 14. Clean the injection site by scrubbing vigorously with an alcohol swab.

Step 15. Subcutaneous injection: Using your thumb and index finger, gently lift a fold of skin on the calf’s neck and insert the needle under the fold parallel with the muscle (do not penetrate the muscle).

Intramuscular injection: Hold the syringe barrel with your thumb and index finger, and keep your wrist loose. Thrust the needle quickly through the skin and into the long muscle of the neck. Pull back on the plunger slightly. If blood enters the syringe, pull it out and select a different site.

Step 16. Slowly inject the medication by pushing the plunger forward. Use extra care when giving thick medications and vitamins. Take your time!

Step 17. After injecting medication, slowly pull the needle straight out. Massage the injection area with an alcohol swab.

Step 18. Release the calf and record the date and injections administered.

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Giving Intranasal Vaccinations

Skills Needed: Ability to restrain calf, ability to read and follow instructions, and basic knowledge of calf anatomy.

Equipment Needed: 10-cc syringe, needle, sterile alcohol pads (or isopropyl alcohol and a paper towel or cotton balls), intranasal applicator, medication.

Time Required: Less than 1 minute per calf.

WHY? Vaccinations or other medications are needed to protect calves from attacks by infectious organisms. All vaccinations should be given at the direction of a veterinarian.

HOW?

Step 1. Quietly catch and halter calf (see Chore Plan 6D). If vaccine is given to newborn calves, it is not necessary to use a halter, simply back the calf into a corner of the pen.

Step 2. Tie calf securely to a post, gate, or stock panel.

Step 3. Reconstitute vaccine if necessary and prepare a dose using needle and syringe (See Chore Plan 7K for detailed instructions).

Step 4. Remove and discard needle.

Step 5. Attach intranasal applicator to syringe in place of the needle.

Step 6. Slowly approach the calf, talking softly. Gently pat the calf and place one hand on her.

Step 7. Hold the calf’s head in a normal or slightly elevated position and place the intranasal applicator inside one nostril.

Step 8. Deliver half of the vaccine to this nostril.

Step 9. Remove the applicator, place it in the other nostril, and deliver the remaining vaccine.

Step 10. Release the calf and record the date and vaccinations administered.

Note: This is a general procedure that is not meant to replace manufacturer’s label instructions. Some products do not require administration in both nostrils; others recommend using a syringe with no needle attached instead of an applicator.

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Vaccine Handling

Skills Needed: Ability to read and follow instructions, and attention to detail.

Equipment Needed: Use of a refrigerator, insulated cooler, needles, syringes, medication.

Time Required: Depends on vaccine.

WHY? Improper handling of vaccines is a leading cause of vaccine failure. Proper handling and storage protect expensive vaccines and ensure their effectiveness.

HOW?

Step 1. Carefully read the product insert. It lists the dose, timing and route of administration, warnings, withdrawal times, storage and disposal instructions, expiration date, and reconstitution procedures (if needed).

Step 2. Shipping: Vaccines should arrive cool. If they are warm, send them back.

Step 3. Storage: Most vaccines require refrigeration or room temperature storage. Exposure to temperature extremes destroys the vaccine.

- Do not freeze.
- Do not expose to heat.
- Do not expose to sunlight (ultra-violet radiation destroys the vaccine).
- Use a small, insulated cooler to maintain correct vaccine temperature when working with a large number of animals.

Step 4. Handling and Use: Modified live vaccines require extreme care because they contain living organisms. Follow manufacturer’s directions carefully.

- Do not combine vaccines (this may inactivate one or both vaccines).
- Do not use expired vaccines.
- When vaccine must be reconstituted:
  - Use only the diluent (liquid) provided.
  - Use a transfer needle to reconstitute dried vaccine. These are double-sided needles; insert one end into the diluent and the other end into the dried powder bottle, which should contain a vacuum. The vacuum will pull diluent into the dried vaccine.
  - Mix the product thoroughly after adding diluent. Continue to mix the vaccine every few minutes to keep the vaccine in solution. This ensures all animals receive the same concentration.
  - Determine the amount of vaccine needed and mix only that amount.
• Do not mix more than can be used within 1 hour (the vaccine loses its effectiveness after about 1 hour).

• Dispose of any reconstituted, unused vaccine. Do not store for future use.

Step 5.  *Sanitation:* Proper sanitation will prevent injection-site infections and the transfer of diseases between animals.

  ▪ **Always use a single needle for a single animal.**
  ▪ Never insert a used needle into a medication bottle.
  ▪ Use an alcohol swab to clean the site and allow it to dry before injecting any vaccines or medications (mud, manure, or water at the injection site increases the risk of infection).
  ▪ Wash hands before and after handling vaccines or medications.


Questions? Please see the herd manager.
*Thank you, and keep up the good work!*
Dehorning

Skills Needed: Ability to restrain calf, ability to work quickly and carefully, and ability to use electric dehorning iron.

Equipment Needed: Electric dehorner, extension cord, halter, headlock or calf cart, scissors, small piece of pine board.

Time Required: 5 minutes per calf.

WHY? Horns are permanently removed from cattle to prevent injury to people and other animals. Calves can be dehorned with an electric dehorner at 3 to 6 weeks of age.

HOW?

Step 1. Plug extension cord into a properly grounded electrical outlet near the work area and plug the electric dehorner into the extension cord.

Step 2. Place the dehorner in a metal bucket and allow it to heat. Dehorners can cause fire, so keep clear of bedding and other flammable material.

Step 3. Local anesthetic may be used; consult your veterinarian. This is recommended for calves dehorned after 10 weeks of age.

Step 4. Quietly catch and restrain calf in headlock, calf cart, or using a halter (see Chore Plan 6D). Make sure calf’s head and body are properly restrained. An assistant may be required.

Step 5. Locate horn buttons to either side of the poll. They will feel like small, rounded buttons. If necessary, trim the long hair around the horn buttons to make them more visible. Use an ordinary pair of scissors.

Step 6. The dehorner must be very hot. Place it against the pine board. If a black ring immediately burns into the board, the iron is ready. If not, continue heating.

Step 7. Place the “red hot” electric dehorner firmly over the horn button while turning the dehorner from left to right for 10 to 20 seconds. When a copper-brown ring forms around the base of the horn button, dehorning is complete. If the copper-colored ring is not continuous, reapply the dehorning iron.

Step 8. If the horn cap comes off and bleeding occurs, place dehorner back on the horn button to cauterize the area and stop the bleeding.
Step 9. Repeat steps 6 and 7 for the second horn button.

Step 10. Place the hot dehorner back into metal bucket until ready to use again.

Step 11. Release calf and observe behavior to be sure it soon returns to normal. Also observe calves for bleeding over the next 6 to 12 hours.

Step 12. Repeat steps 4 through 7 for additional calves.

Questions? Please see the herd manager. Thank you, and keep up the good work!
Extra Teat Removal

Skills Needed: Ability to restrain calf and ability to work quickly and carefully.

Equipment Needed: Halter, scissors, sterile alcohol pad (or isopropyl alcohol and cotton balls), 7% tincture of iodine.

Time Required: 5 minutes per calf.

WHY? Extra teats may interfere with teat cup placement, develop into functional glands, or become infected with mastitis. Removing extra teats prevents these problems and improves udder appearance. Teats can be removed when calves are 1 to 2 months old.

HOW?

Step 1. Remove alcohol swab from wrapper (or saturate a cotton ball with isopropyl alcohol to make a swab), and use it to disinfect scissors.

Step 2. Quietly catch and halter calf.

Step 3. Gently lay calf on its side on the clean, well-bedded floor (see Chore Plan 6D). Have an assistant restrain the calf by pulling one leg forward.

Step 4. Carefully examine the teats to determine which ones to remove. The four regular teats should be arranged symmetrically, with the rear teats closer together (trapezoid appearance). Extra teats are typically smaller and may be found beside or behind regular teats.

Step 5. Be absolutely sure which teats are extra. If a regular teat is removed, that quarter will never function. If in doubt, do not remove the teat.

Step 6. Clean the area surrounding the base of the extra teat with an alcohol swab.

Step 7. Use sharp, short-bladed scissors to remove extra teats. Hold scissors with the blades pointed away from the regular teats.
Step 8. Grasp the end of the extra teat and pull it slightly away from the body. Make a clean, lengthwise cut at the base of the teat.

Step 9. Coat the wound with 7% tincture of iodine to prevent infection.

Step 10. Repeat steps 6 through 9 for each extra teat.

Step 11. Release the calf. Be sure to provide clean, dry bedding to prevent infection.

Questions? Please see the herd manager.
Thank you, and keep up the good work!
Call the Veterinarian

Skills Needed: Ability to read and ability to use telephone.

Equipment Needed: Telephone, vet’s phone number.

Time Required: 2 minutes.

WHY? Calves with severe illnesses may benefit from veterinary care.

HOW?
Step 1. Call the vet for assistance with very sick calves or for emergencies.
Step 2. Fill in your veterinarian’s phone numbers below:

Veterinary Office: ___________________________________________________
                        ___________________________________________________
                        ___________________________________________________

Mobile Phone/Pager: _________________________________________________
                        ___________________________________________________
                        ___________________________________________________

Emergencies: _______________________________________________________
                        ___________________________________________________
                        ___________________________________________________

Questions? Please see the herd manager.
Thank you, and keep up the good work!