Birthing & Babies Clinic

Saturday | April 11, 2026

Burning Daylight Draft Farm, Dennison MN

wiferylivestockskills@gmail.com

https://mfma.org/The-Wifery-Livestock-Skills-Consortium

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Cattle (Bovine)

Terminology

- Cow: female bovine that has given birth
- Heifer: young female bovine that has not given birth
- Freemartin: sterile twin heifer when twinned with a bull
- Bull: intact male bovine
- Steer: castrated male bovine
- Cryptorchid: infertile male bovine when one or both testicles remain in the body cavity and do not descend into the scrotum

Vitals

Temperature (Fahrenheit)

- Calf: 101.5 -103
- Cow: 100.0-102.5

Heart Rate (Beats per minute)

- Calf: 100 – 140
- Cow: 48 – 84
    - This can be assessed by using a stethoscope and listening over the left hand side of the cow's chest behind the cow's elbow.

Respiratory Rate (Breaths per minute)

- Calf: 30 – 60
- Cow: 26-50

Capillary Refill Time

2 seconds or less

Skin Pinch Test

Skin 'snaps' back, 1sec

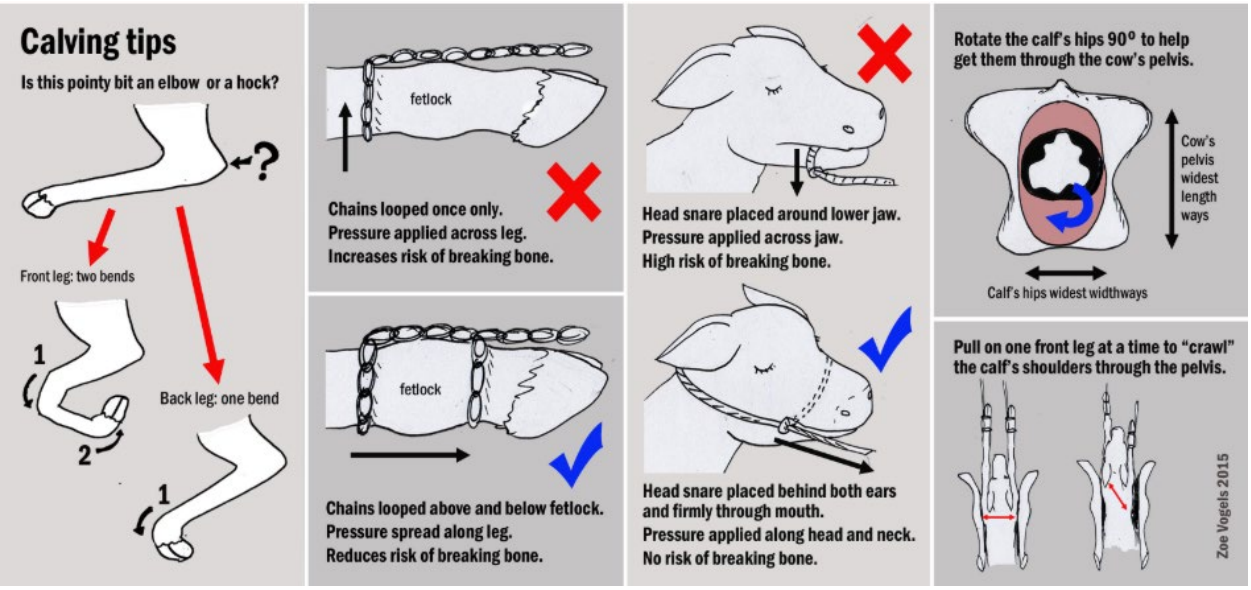
Breeding

- Non-seasonal polyestrous
- 21-day cycle
- Heifers must reach puberty by 13-14 months of age to calve as two-year-olds
    - Puberty is influenced by age, weight and breed
- Natural mating
- AI – frozen semen
- Heat synchronization
    - Hormones

- CIDR(TM) (controlled internal drug releasing device). CIDR(TM)s are T-shaped flexible silicone and nylon devices containing progesterone.

Calving

- 279 - 283 days gestation
  - there can be significant variation between breeds and bull calves can have slightly longer gestation length
- Cows will typically have a single calf, but they can be known to have up to three calves at a time
- Calf size varies by breed, but newborns usually weigh between 80 and 140 pounds
  - Calves immediately post-birth
    - standing within 60 minutes, be concerned after 90 minutes
    - nursing within 2 hours, be concerned after 3 hours
- Milk/colostrum prior to or at parturition
- Preferred calf presentation is head resting on front feet
- Once the water bag appears, calving can take between 2-4 hours
  - Provide assistance if no progress is made by the calf after 30 minutes



Rumen Motility

The rumen is always contracting and moving. Healthy animals will have one to two rumen contractions per minute. The contractions mix the rumen contents, bring microbes in contact with new feedstuffs, reduce flotation of solids, and move materials out of the rumen. Lack of or a decrease in frequency of rumen movements is one way of diagnosing sick animals.

Injections, Recommended Needle Size & Injection Sites

Subcutaneous (SubQ)

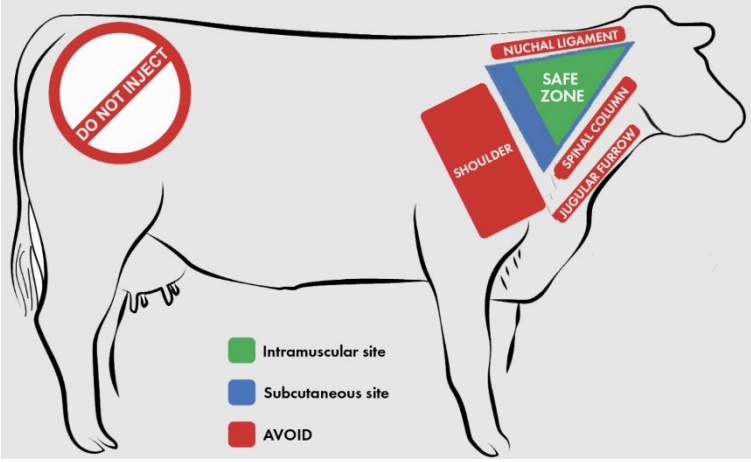
- Adult: 16 or 18g X ½ or ¾ in
- Calf: 20g X ½ in

Intramuscular (IM)

- Adult: 16 or 18g X 1 or 1.5in
- Calf: 20g X ¾ or 1in

Intravenous (IV)

- Adult: 18g X 1.5in
- Calf: 20g X ¾ or 1in

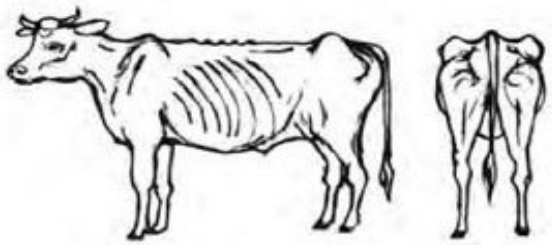


Body Condition Scoring

BODY CONDITION SCORE (BCS) CHART

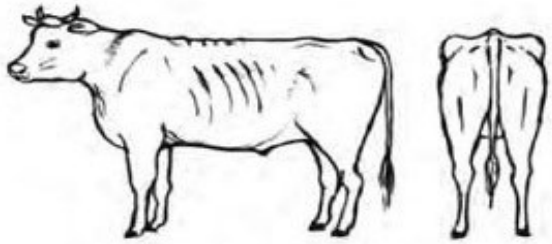
Condition score 1

Backbone prominent
Hips and shoulder bones prominent
Ribs clearly visible
Tail-head area recessed
Skeletal body outline



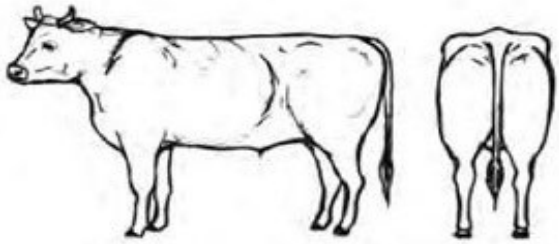
Condition score 2

Backbone visible
Hips and shoulder bones visible
Ribs visible faintly
Tail-head area slightly recessed
Body outline bony



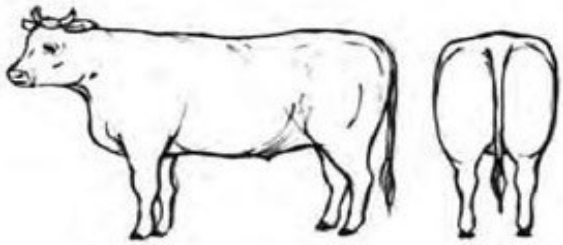
Condition score 3

Hip bones visible faintly
Ribs generally not visible
Tail-head area not recessed
Body outline almost smooth



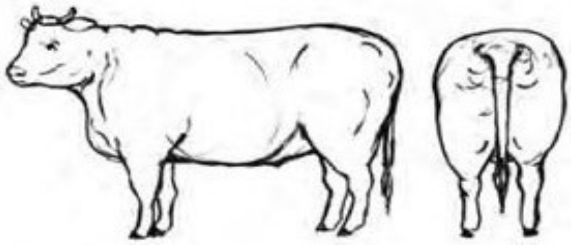
Condition score 4

Hip bones not visible
Ribs well covered
Tail-head area slightly lumpy
Body outline rounded



Condition score 5

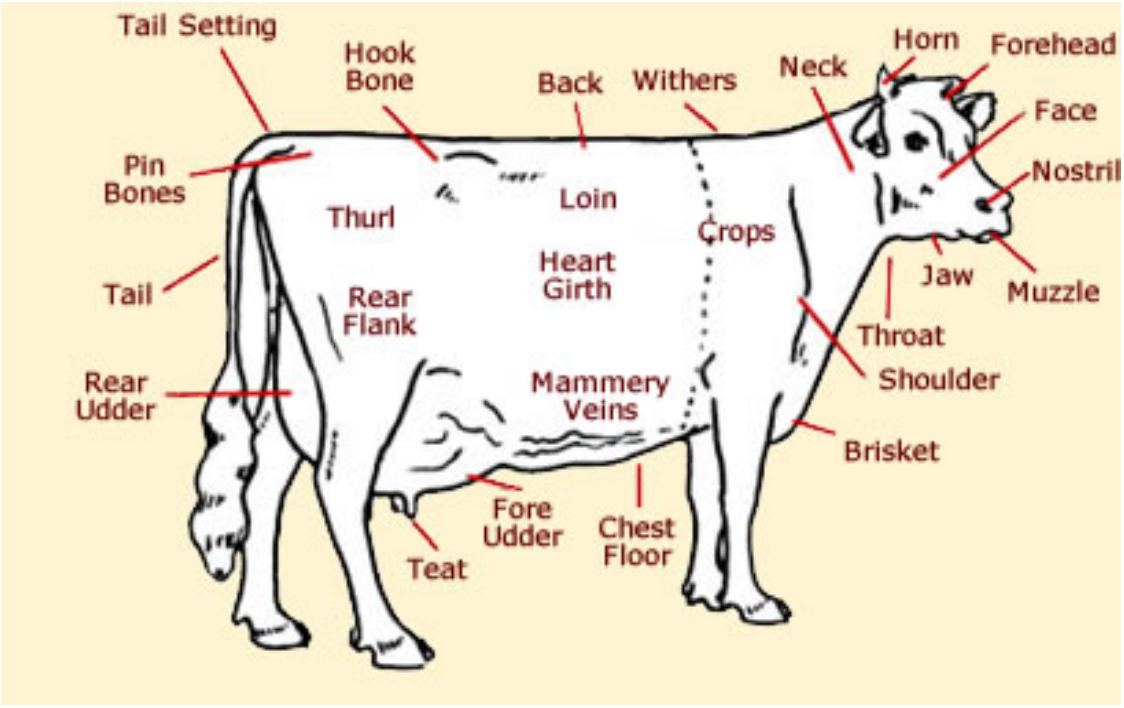
Hip bones showing fat deposit
Ribs very well covered
Tail-head area very lumpy
Body outline bulging due to fat

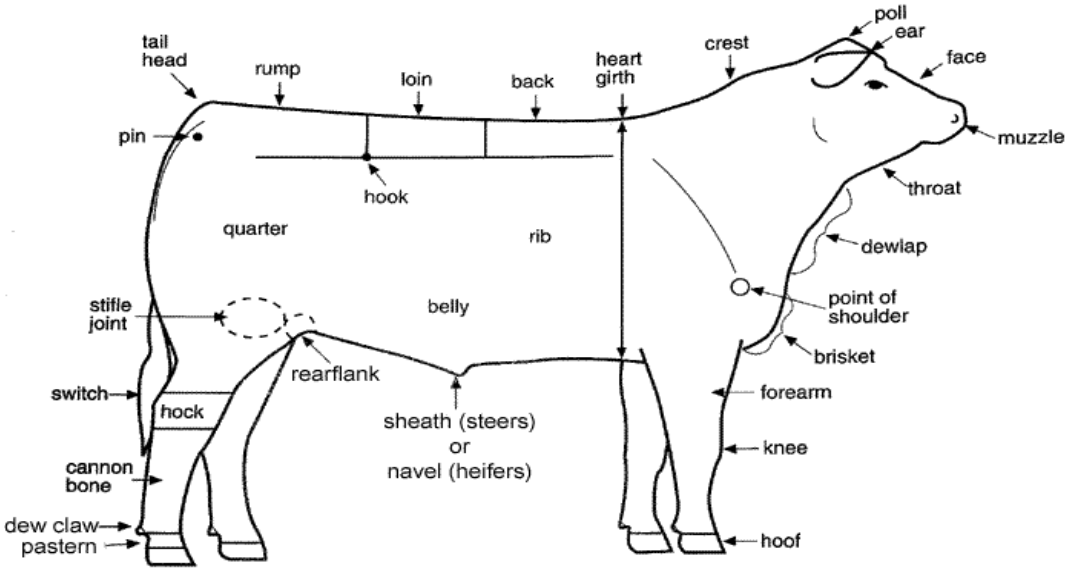


MINIATURE-CATTLE.COM

http://www.daff.qld.gov.au/__data/assets/pdf_file/0015/53520/Animal-HD-Investigation-Condition-scores.pdf

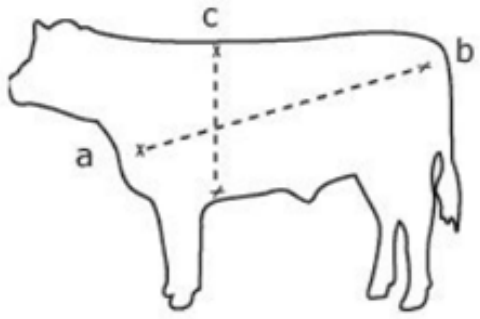
Basic Anatomy





Calculating Weights

CATTLE



Measuring beef cattle.

Measure the circumference of the animal, as shown in "distance C" in the illustration. Make sure to measure girth in relation to the location of the animal's heart.

Measure the length of the animal's body, as shown in distance A-B in the illustration.

Using the measurements from steps 1 and 2, calculate body weight using the formula HEART GIRTH x HEART GIRTH x BODY LENGTH / 300 = ANIMAL WEIGHT IN POUNDS. For example, if a beef cow has a heart girth equal to 70 inches and a body length equal to 78 inches, the calculation would be (70 x 70 x 78) / 300 = 1,274 lbs.

Vaccination Schedule

Beef Cattle

Even though there is not a 'one size fits all' vaccination program, the following provides an example of a common vaccination schedule. Again, the herd veterinarian should be consulted to determine the best vaccine program for your operation.

Cows[a]
Pre-breeding
- IBR, BVDV Type 1 & 2, BRSV, PI3
- Leptospirosis (multivalent)
- Campylobacter

Pregnancy examination
- Leptospirosis (multivalent)[b]

Calves
Calf processing
- Clostridial vaccine[c]
- IBR, BVDV Type 1 & 2, BRSV, PI3[d,e]

Pre-Weaning or Weaning[f]
- Clostridial vaccine
- IBR, BVDV Type 1 & 2, BRSV, PI3[e]

Breeding Bulls[a]
Pre-breeding
- IBR, BVDV Type 1 & 2, BRSV, PI3
- Leptospirosis
- Campylobacter

Replacement Heifers[a]
Pre-breeding
- IBR, BVDV Type 1 & 2, BRSV, PI3
- Leptospirosis[g]
- Campylobacter[g]

Comments
[a]Clostridial vaccines are not included in the mature animal vaccine programs outlined here. The occurrence of clostridial disease in mature animals depends on various factors, including herd history, location, and other risk factors, which influence whether these vaccines are recommended. For herds that choose to administer a Clostridial vaccine to the mature cattle, an annual booster is typically sufficient. However, in herds at risk for 'Redwater' (caused by *Clostridium haemolyticum*), administering two doses annually with an 8-way vaccine is recommended.

[b]Certain Lepto serovars have a short duration of immunity; therefore, repeating Lepto at pregnancy check time may be necessary to provide protection for the duration of the pregnancy.

[c]Most clostridial vaccine labels recommend an initial dose followed by booster 2 to 6 weeks later for animals that have not been previously vaccinated. However, logistical challenges often make this difficult.

Consult with your veterinarian to determine if a booster dose is necessary. If banding is the method of castration, a clostridial vaccine containing tetanus toxoid should be administered.

[d]Historically, vaccinating beef calves under 4 to 5 months of age was thought to be ineffective due to interference from maternal antibodies received through colostrum. However, recent research shows that vaccination at a young age can still provide some protection, though the response may not be as strong as in older calves. This protection is less reliable in calves younger than two weeks, as high maternal antibody levels can reduce vaccine effectiveness. Most studies that have evaluated vaccination effectiveness in young calves have utilized a modified-live virus (MLV) vaccine. If using an MLV vaccine at calf processing, be sure to follow label precautions, especially for calves nursing pregnant cows. If using a killed virus (KV) vaccine, a booster dose is necessary 2 – 5 week later for better protection.

[e]Intranasal vaccines for respiratory disease do not currently contain BVDV Type 1 & 2, so a separate injectable BVDV vaccine is required.

[f]Vaccinating calves 3 - 4 weeks prior to weaning provides ample time for the calves to build immunity before they undergo the stress of weaning. However, some find it more convenient to vaccinate calves the day of weaning.

[g]Replacement heifers will require two doses of Leptospirosis and Campylobacter 2 – 5 weeks apart if they have not received these vaccines before. The first dose can be administered 60 days prior to breeding and again at 30 days prior to breeding when the viral vaccine is administered. The other option is to administer the Leptospirosis and Campylobacter along with the viral vaccine 30 days prior to the breeding season and repeat Leptospirosis and Campylobacter at breeding time.

Source: University of Missouri Extension, February 2025

Dairy Cattle

Neonatal Calves

- An oral vaccine containing bovine rotavirus and bovine coronavirus can be given orally to newborn calves. The oral MLV vaccine should be given 30 minutes prior to ingestion of colostrum or it will be inactivated. Some veterinarians prefer to use injectable rotavirus/ coronavirus/E. coli in the dam prior to calving and depend on colostral antibodies to protect calves.
- Vaccination of calves for infectious bovine rhinotracheitis (IBR), bovine virus diarrhea (BVD), parainfluenza-3 (PI-3), and bovine respiratory syncytial virus (BRSV) is usually delayed until 3-6 months of age. Veterinarians occasionally advise use of this vaccine in selected herds with a history of these diseases in young calves, but this is not a standard recommendation. Vaccination of neonatal calves with intranasal IBR/PI-3/BRSV vaccine may be more beneficial than standard injectable vaccines in calves. In order to assure adequate immune response, intranasal respiratory vaccines should be administered at 3 days of age or older. Intranasal vaccines generally have a shorter duration of immunity than injectable vaccines. DA 3088 March 2016
- Recent research suggests that vaccinating calves against Johnes disease is an effective aid in the control of this disease. The vaccine can only be administered by a veterinarian and must be done according to state regulations. Consult with your veterinarian regarding the need to use this vaccine in your herd.

4 to 6 Months of Age

- IBR, BVD, PI-3, BRSV
- Leptospirosis (5 strain)
- Clostridial group – 7 or 8 way
- Histophilus somnus (Needs to be risk based; consult with your veterinarian)

Pre-Breeding

- IBR, BVD, PI-3, BRSV
- Leptospirosis (5 strain)
- Clostridial group – 7 or 8 way

Pre-Calving

- Clostridial group – 7 or 8 way
- E. coli mastitis vaccine at least twice, at six and three weeks prior to calving
- Rotavirus, coronavirus, and E. coli scours vaccine twice, at six and three weeks prior to calving

Adult Cows

Cows are generally vaccinated for IBR, BVD, PI3, and BRSV virus, leptospirosis, clostridial, E. coli mastitis, and calf diarrhea diseases during the lactation period and/or the dry period. Modified live virus vaccines may not be able to be used at this time. Consult with your veterinarian before using MLV products in pregnant cows.
Source: Iowa State University Extension, March 2016

Bovine Parturition

There are three stages to the birthing process, or parturition: dilation of the cervix, delivery of the calf, and delivery of the placenta. Knowing the normal birth process will help you decide whether to intervene.

Stage 1: Dilation of the Cervix

You might not even notice this stage, which may take days to complete. Uterine muscular activity is quiet during this stage as the cervix softens, and the pelvic ligaments relax. At this time, a thick clear mucus (commonly referred to as a 'string') may hang from the vagina. The cow's appetite decreases, and she may prefer to be off by herself. Uterine contractions begin by the end of Stage 1, pushing uterine contents against the cervix, causing further dilation.

Stage 2: Delivery of the Calf

Appearance of the water bag through the vulva signals the start of Stage 2 labor. The calf should be delivered within 2 to 5 hours of the appearance of the water bag. More recent research has found that healthy heifers with normal calf presentation will calve unassisted within 1 hour of the start of Stage 2; healthy cows with normal calf presentation calve within 22 minutes of the start of Stage 2.

So, when will cows need assistance? The decision to intervene is a matter of judgment, and judgment improves with experience. The cow that labors over an hour with the calf's front feet and nose showing and no signs of further progress would certainly appreciate a little help. The cow that labors over an hour with nothing showing obviously needs help. You may feel uneasy watching a laboring cow when you don't know when Stage 2 began. But don't rush the process.

Conduct a vaginal exam to assess the presentation after watching for 20 to 30 minutes.

Begin by cleaning the cow's vulva, rectum, and surrounding area under the tail as well as your gloved hands and arms with soap and water. Cleanliness is very important. Wear protective sleeves and apply obstetric lubricant to your gloved hands. Place your gloved hand in the vagina and feel for the cervix. If it is not dilated, it will feel as if your fingers are passing through a firm tube. Once dilated fully, you should no longer feel the cervical edge.

Can you put your hand on the calf? Is there straight- line access to touch it? Or does your hand have to turn or twist through folds of vagina to touch the calf? If so, a uterine torsion may be present, and you will need to call for veterinary assistance. You may be able to correct uterine torsions with instruction from your veterinarian and bit of practice, but this is something you should not try to correct for the first time on your own.

When assessing the calf's presentation, determine its orientation in relation to the cow's spine and find three things belonging to the same calf: two front feet with its head in between **or** two rear feet with its tail in between. If the presentation is normal, you may allow the cow to labor for 40 minutes to an hour, especially if the water bag is still present around the calf. If the water bag has broken, the calf should be delivered sooner (as long as the cervix is fully dilated).

When is it safe to pull a forward calf?

Start your assessment to determine if the calf is small enough to be delivered vaginally while applying traction with the pull of one person during a contraction. In the standing animal with the calf's head completely in the pelvic cavity, you should be able to place a hand between the calf's head and the cow's backbone. You should also be able to feel both points of the calf's shoulder 2 inches (three-fingers width) or less forward to the pelvic inlet.

In the recumbent animal you must be able to feel the points of the shoulder 2 inches or less forward of the pelvic inlet as traction is applied by one person.

When is it safe to pull a backward calf?

If you can't see the hocks with one person pulling, extraction of a posterior presentation may not be possible. When the calf's hip joints pass into the pelvic canal, its hocks will be visible about one hand's width beyond the vulva. If you can't extract the hocks, a pelvic mismatch is occurring; traction should be discontinued, and your veterinarian should be called.

In attempting to correct a malposition, it is useful to list what can't be done so you don't waste time trying.

First, get the cow up and on her feet, restrained in a well-lit area that is safe for both you and cow to work in. It is much easier for you to work when both you and the cow are standing. There is more room for you to manipulate the fetus when the cow's abdominal contents are not pushing up and against the pelvic canal. It may improve your reach if you stand on a firm, raised platform such as a hay bale or block.

1. Don't change an anterior position into a posterior one or vice versa—there usually isn't enough room to do this without tearing the uterus.
2. You can't deliver an anterior presentation unless both legs and the head of the same calf are through the cervix. Sometimes only the legs are through and the head turns away. The head must be straightened, snared, or otherwise committed to the cervix before you continue traction.
3. You can't deliver a posterior presentation until you have both rear legs of the same calf in proper position.
4. You can't deliver three or more legs through the cervix. They may be from the same calf or from twins. The proper two legs have to be sorted out and the others pushed out of the way.
5. Only rarely can you deliver a calf with just its head presenting. Take a few minutes to snare the head so you can keep track of it before you push it back into the uterus. Lubricate the head and push it back and bring the forelegs through the vagina. If the head is swollen and already delivered past the vulva, it may be easier to accomplish this by pushing on the shoulders. If the calf is dead, the head can be amputated to make room to get the legs through.

There may be times when you can't get a veterinarian to help with a complicated delivery. The graphics depicted below provide some guidance.*1* Whenever possible, however, get a veterinarian to help because the outcome is likely to be far better.

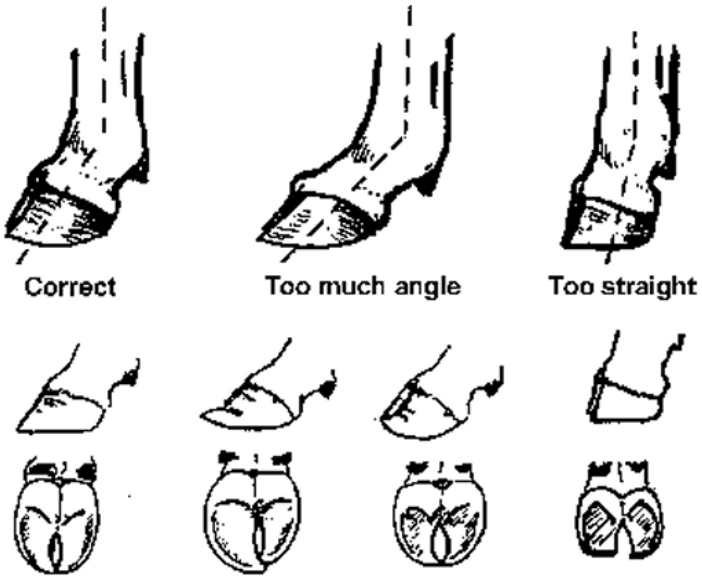
Stage 3: Delivery of the Placenta

The placenta should shed within 8 to 12 hours of the calf's delivery. By definition, a retained placenta is one that is not shed after 12 hours. If retained, do not forcibly remove it. The cervix remains open as the placental membranes keep it open. This is a good thing, as healing occurs under aerobic conditions to slough the placenta out in 4 to 7 days. Administration of injectable antibiotics may be warranted if the cow develops a fever. Antibiotics and other supplements placed in the uterus to treat a retained placenta are ineffective and may cause violative drug residues in meat and/or milk. A uterine infection (pyometra) may result if pieces of fetal membranes become trapped behind a closed cervix.

Have your veterinarian conduct 30-day post-calving uterine examinations on those cows that experienced difficult calvings (and/or those whose calves you pulled) or retained placenta.

Source: https://livestock.extension.wisc.edu/articles/three-stages-of-bovine-parturition/#Introduction

Hoof Trimming



Source: [Ohio State University Extension 4-H Skillathon]

Goats (Caprine)

Terminology

- Doe/Nanny: a female goat.
- Buck/Billy: an intact male goat.
- Wether: a castrated male goat.
- Kid: a baby goat under one year old.
- Doeling: a young female goat (usually under 1-2 years).
- Buckling: a young male goat (usually under 1-2 years).
- Yearling: a goat between 1 and 2 years old.

Vitals

Normal Rectal Temperature (Fahrenheit):

- Adult: 101-103.5
- Kid: 102-104

Normal Resting Heart Rate (Beats per minute):

- Adult: 70-80
- Kid: 120-160
    - Use a stethoscope or your hand, placing it on the left side of the chest wall until you hear or feel the heartbeats. Count them for one full minute. (There are usually two different sounds when using the stethoscope, count the louder first sound only.)

Normal Resting Respiratory Rate (Breaths per minute):

- Adult: 16-34
- Kid: 40-65

Capillary Refill Time

2 seconds or less

Skin Pinch Test

Skin ‘snaps’ back, 1sec

Breeding

- Seasonal polyestrous
- 21-day cycle
- Does will reach puberty in 6-8 months, bucks in 4-6 months
    - Puberty is influenced by age, weight and breed
- Natural mating
- AI – frozen semen
- Heat synchronization
    - Hormones

- CIDR(TM) (controlled internal drug releasing device). CIDR(TM)s are T-shaped flexible silicone and nylon devices containing progesterone.

Kidding

- Gestation Length: 143-157 days, there can be significant variation between breeds
- Litter Size: does will typically have twins, but they can be known to have up to five kids at a time
- Kid Size: varies by breed, but newborns (standard size) usually weigh between 8-12 pounds
- Milk/colostrum prior to or at parturition
- Preferred kid presentation is head resting on front feet
- Once the water bag appears, kidding can take between 2-4 hours
    - Provide assistance if no progress is made by the kid after 30 minutes

Rumen Motility

The rumen is always contracting and moving. Healthy animals will have one to two rumen contractions per minute. The contractions mix the rumen contents, bring microbes in contact with new feedstuffs, reduce flotation of solids, and move materials out of the rumen. Lack of or a decrease in frequency of rumen movements is one way of diagnosing sick animals.

Sources
https://www.merckvetmanual.com/management-and-nutrition/management-of-reproduction-goats/puberty-and-estrus-in-goats

Injections, Recommended Needle Size & Injection Sites

Subcutaneous (SubQ)

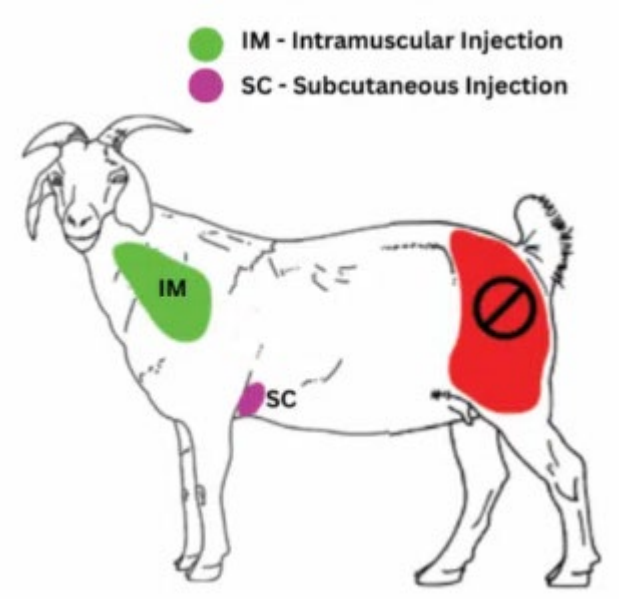
- Adult: 18 or 20g X ½ or ¾ in
- Kid: 20 or 22g X ½ in

Intramuscular (IM)

- Adult: 18 or 20g X ¾ or 1in
- Kid: 20 or 22g X ¾ in

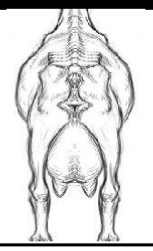
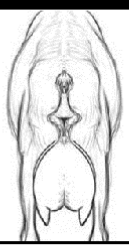
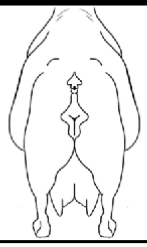
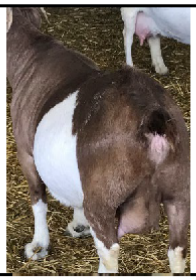
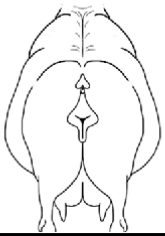
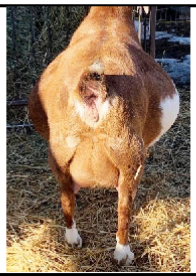
Intravenous (IV)

- Adult: 20g X 1in
- Kid: 20 or 22g X ¾ or 1in



Body Condition Scoring

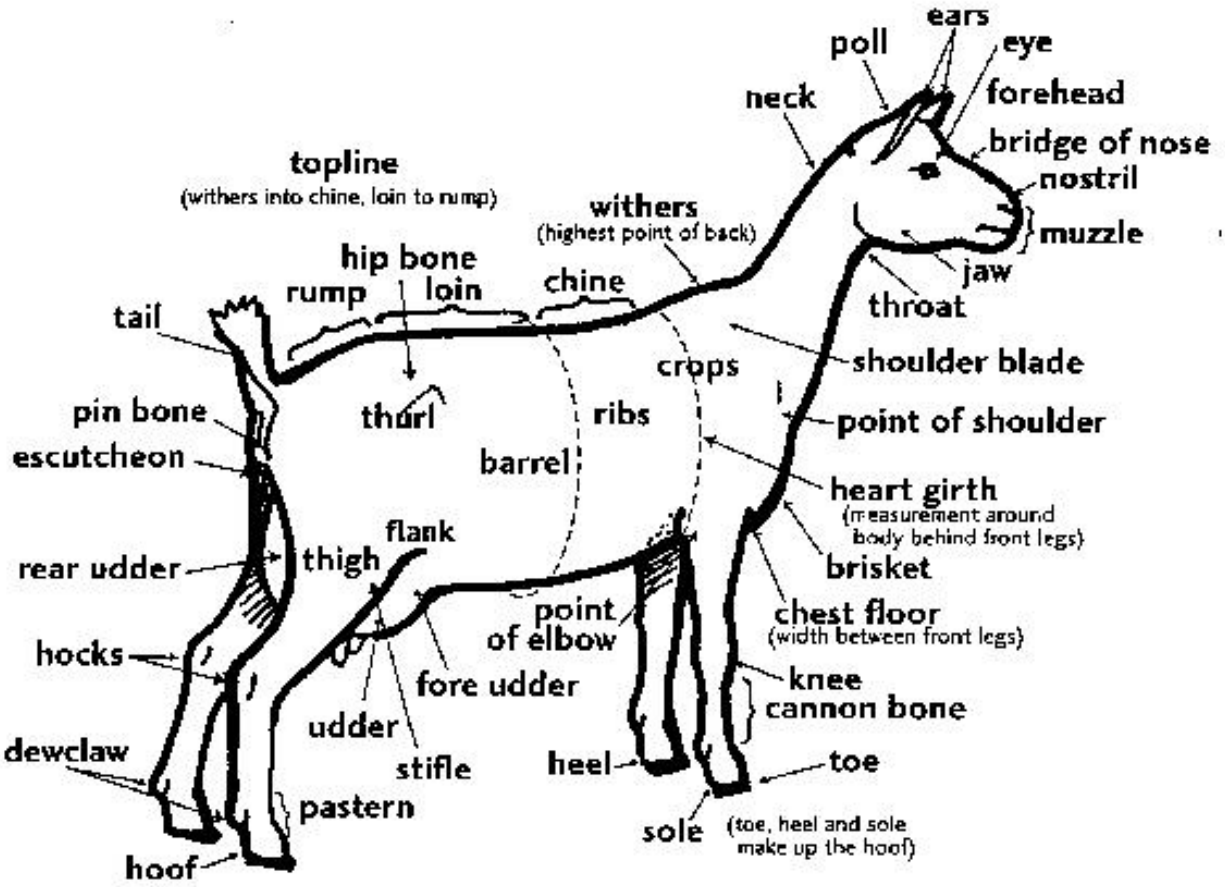
Body Condition Score for Meat Goats*

		Lumbar spine	Ribs	Sternum	
Emaciated	**BCS 1**** 	**Top of spine:** clearly visible, can easily be pinched. Deep depression between each vertebra. **Short ribs:** form a continuous shelf that fingers can grasp. Deep depression between each. **Transition:** no fat and little muscle is felt between the top of the spine and short ribs.	**Ribs:** Clearly visible. Fingers easily penetrate space between ribs.	**Cartilage:** easily felt **Fat pad:** can easily be grasped between thumb and forefinger and moved side to side.	
Thin	**BCS 2** 	**Top of spine:** visible, some muscle can be felt between skin and bone. **Short ribs:** form a shelf that fingers can grasp. **Transition:** deep depression from the top of the spine to the short ribs.	**Ribs:** some can be seen. Fingers easily penetrate space between ribs.	**Cartilage:** not easily felt. **Fat pad:** can be grasped and moved slightly from side to side.	
Ideal	**BCS 3** 	**Top of spine:** not prominent, slight hollow between vertebrae. Cannot easily be grasped. **Short ribs:** shelf is slightly noticeable, cannot be grasped. **Transition:** smooth slope from top of the spine to short ribs.	**Ribs:** difficult to see. Space between ribs felt with pressure.	**Cartilage:** barely felt. **Fat pad:** wide and thick. It can be grasped, but has very little movement.	
Overweight	**BCS 4** 	**Top of spine:** cannot be seen. No indent between vertebrae. Top of spine is flat and cannot be grasped. **Short ribs:** no ridge or shelf present. **Transition:** rounded from the top of the spine to the short ribs.	**Ribs:** cannot be seen. Side of the animal is flat in appearance. Space between ribs only felt with strong pressure.	**Cartilage:** cannot be felt. **Fat pad:** difficult to grasp, cannot be moved side to side.	
Obese	**BCS 5** 	**Top of spine:** buried in fat, slight indent surrounded by bulging fat. Rump looks like the top of a heart. Individual vertebrae cannot be felt. **Short ribs:** individual vertebrae cannot be felt. **Transition:** fat bulges out from the top of the spine to the short ribs.	**Ribs:** not visible. Space between ribs cannot be felt.	**Cartilage:** cannot be felt **Fat pad:** cannot be grasped or moved.	

*One unit of Body Condition Score is equivalent to 7-10 kg (15-22 lb)
**Unfit for transport other than under advice of veterinarian

Ontario Goat | Growing Forward 2 | AAC | Ontario | Canada

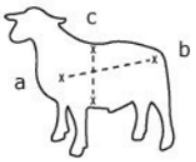
Basic Anatomy



http://www.thegoatchick.com/goat-anatomy.html

Calculating Weights

SHEEP/GOAT



Measuring sheep.

Measure the circumference of the animal, as shown in distance C in the illustration. Make sure to measure girth in relation to the location of the animal's heart. On a sheep, ensure an accurate measurement by compressing the sheep's wool so that the circumference reflects that of the body and does not include that of the body plus the wool.

Measure the length of the animal's body, as shown in distance A-B in the illustration. From point of shoulder to pin bone.

Using the measurements from steps 1 and 2, calculate body weight using the formula HEART GIRTH x HEART GIRTH x BODY LENGTH / 300 = ANIMAL WEIGHT IN POUNDS.

For example, if a sheep has a heart girth equal to 35 inches and a body length equal to 30 inches, the calculation would be (35 x 35 x 30) / 300 = 122 lbs.

Vaccination Schedule

Stage of production	Timing	Recommended vaccines/health management	Diseases covered	Optional vaccines*
Pregnant sheep and goats	2–4 weeks prior to lambing or kidding	• *Clostridium perfringens* types C and D and tetanus. Will need to use cattle vaccines labeled safe for sheep and goats. • Topical external parasite control (permethrin)	*Clostridium perfringens* types C and D and tetanus Keds and lice in sheep	
Kid goats	At lambing or kidding	• Topical and drench wormers to dams	Prevents internal parasite infestation	SE/vitamin E can help prevent white muscle disease
New lambs	Lambs 2 weeks of age	• Dock tails and castrate	•	300 I.U. tetanus antitoxin, if dam was not vaccinated during gestation
	30 days after lambing or kidding. Booster at 45 days (2 weeks later).	• Clostridium perfringens types C and D antitoxin	Enterotoxemia	Ovine ecthyma for soremouth
Ewes and does	60–30 days pre-breeding	• *Campylobacter fetus-jejuni* bacterin	Vibriosis (late-term abortions) Chlamydia (late-term abortions; vaccine can be	

Stage of production	Timing	Recommended vaccines/health management	Diseases covered	Optional vaccines*
		• *Chlamydia psittaci* ewe vaccine • Clostridial 8-way (once) • Caseous lymphadenitis (CL)	used in both sheep and goats) Eight clostridial strain bacterial diseases CL, a contagious bacterial disease that causes skin lesions and abscesses	
Bucks and rams	30–60 days pre-breeding	1. Clostridial 8-way • Anthelmintic (de-wormer)	Eight clostridial strain bacterial diseases Prevents parasite infestation	

Source: New Mexico State University Extension

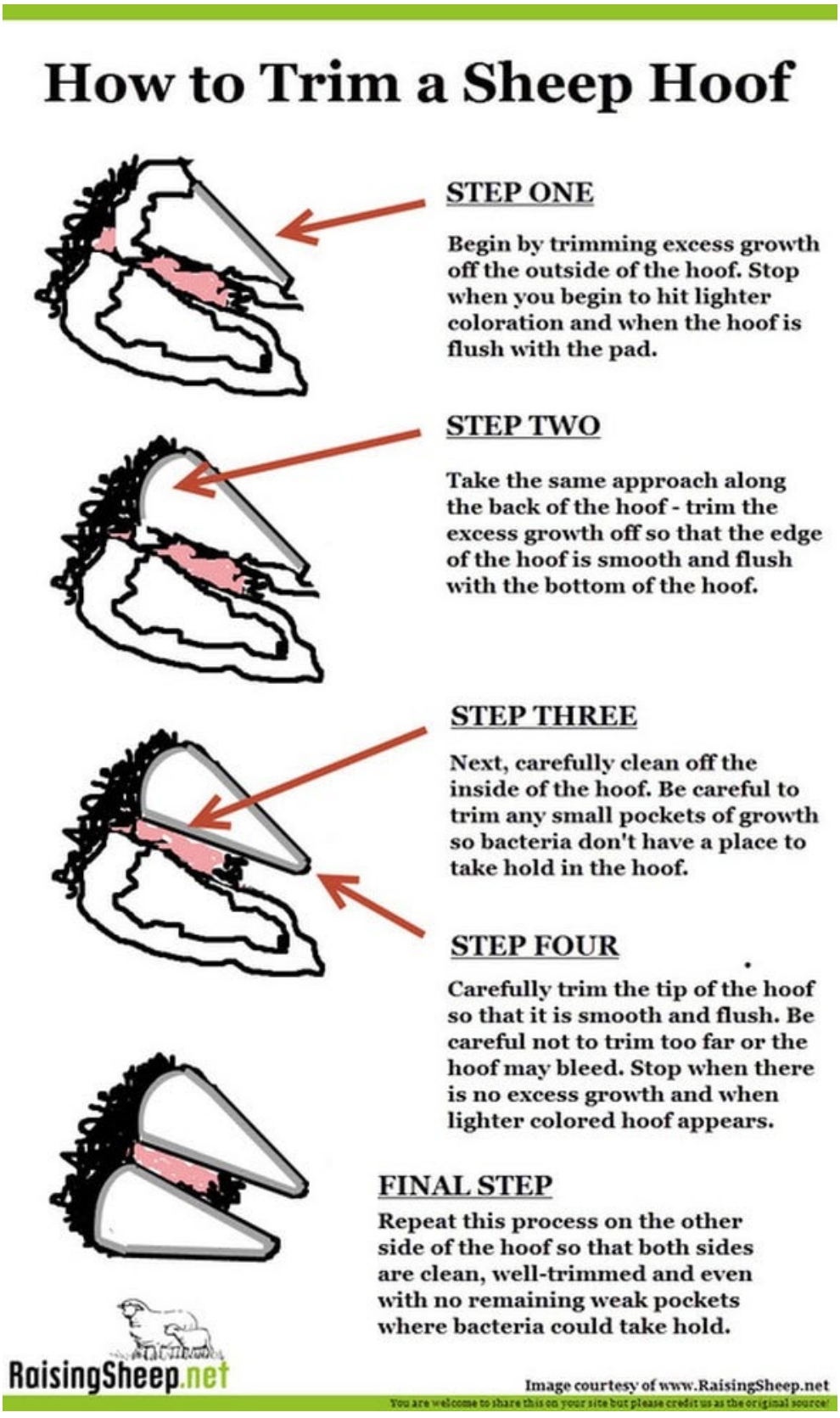
Goat Parturition

Following are normal behaviors that can be observed during kidding:

- Doe will become restless and separate herself from the rest of the group.
- Sometimes pregnant dams will refrain from eating as lambing or kidding becomes imminent (< 3 hours).
- Doe will begin pawing at the ground and appear to make a "nest."
- Doe will make soft, short vocalizations as if she is calling to her kids. (This sound is distinct from the normal cry of a goat and can be easily recognized with experience.)
- Mucus will be discharged from the vulva.
- Active contractions will begin, during which the doe will arch her back and will repeatedly lie down and stand up.
- The water bag will be delivered first. Sometimes it breaks prior to delivery and all you will see is fluid (this is easy to miss).

https://content.ces.ncsu.edu/lambing-and-kidding-cheat-sheet-for-beginning-small-ruminant-producers#section_heading_16393

Hoof Trimming



Horse (Equine)

Terminology

- **Foal:** A young horse under one year of age.
- **Filly:** A young female horse, typically under four years old.
- **Colt:** A young, intact male horse, typically under four years old.
- **Mare:** An adult female horse, four years of age or older.
- **Stallion:** An adult, intact male horse (four years or older) capable of breeding.
- **Gelding:** A castrated male horse of any age.
- **Yearling:** A horse between one and two years old.

Vitals

Normal Rectal Temperature (Fahrenheit)

- Horse: 99.0-101.0
  Foal: 99.5-102.0

Normal Resting Heart Rate (Beats per minute)

- Horse: 28-40
- Foal: 80-100
  - Stethoscope in the 'armpit' on the left side.

Normal Resting Respiratory Rate (Breaths per minute):

- Horse: 10-14
- Foal: 20-40

Capillary Refill Time

2 seconds or less

Skin Pinch Test

Skin 'snaps' back, 1sec

Breeding

- Mares are seasonally polyestrous and cycle when the length of daylight is long
- Mares continue to ovulate regularly every 21 days throughout the breeding season, the length of estrus (sexual receptivity) varies from 2–8 days, and the length of diestrus varies accordingly to maintain a 21-day interval.

Source: https://www.merckvetmanual.com/management-and-nutrition/management-of-reproduction-horses/the-reproductive-cycle-of-horses

Foaling

- The gestation period in horses typically lasts around 340 days, though it can vary between 320 and 370 days. Donkeys, on the other hand, have a longer average gestation, often ranging from 360 to 435 days.
- The first trimester (0 to 114 days) is crucial for early fetal development, as the embryo implants and begins to form organs and limbs. Regular ultrasounds are essential to monitor progress and check for twins.
- The second trimester (115 to 226 days) sees rapid fetal growth as muscles and bones mature. While the mare's nutritional needs remain largely unchanged, vaccination against equine herpesvirus is important during this stage.
- The third trimester (227 to 340 days) involves accelerated fetal growth, with the foal gaining about 1 pound per day. Close monitoring for signs of labor and potential placental issues is critical.
- Complications during pregnancy can include prematurity (gestation under 320 days), prolonged gestation, placental insufficiency, infections, and metabolic diseases, all of which require veterinary attention.
- Litter Size: Horses usually give birth to a single foal per year. Giving birth to twins is extremely rare and high-risk. Often methods are used to terminate one of the embryos to prevent twins from being born because there isn't enough room or nutrients to support growth of more than one foal.
- Basic Timeline: Mares tend to deliver the baby within 30 minutes of the water breaking. Newborn foals usually weigh about 10% of the weight of the mare. Once the foal is born, the mare may need assistance ensuring that the amniotic sac has broken and is not covering the foal's nose. Most foals blow the liquid from their nose on their own.

Source: https://madbarn.com/gestation-period-in-horses/?srsltid=AfmBOoqKuNdYqTDKP200SLb8E7ijFOBs5Mf1_9Sldlm35-qcDthyh5Yi

Gut Sounds

There are many ranking methods, here is one by number:
0 - Silent, no motility heard during 30 seconds
1 - Less than normal motility
2 - Normal motility
3 - Hypermotile, more gut sounds than usual

Motility is usually lessened in horses in abdominal pain. Horses that have not been offered feed in hours will also have reduced motility.

Normal for an adult: 3-4/minute. To listen to gut sounds you will need a stethoscope. If the gut sounds are very loud you may be able to hear them by listening with your ear up the horse's flank. You want to listen on both the right and left sides for 1 minute each. You can also listen on the upper and lower quadrants on the left and right side.

https://clearylakevets.com/wp-content/uploads/2021/06/Vital-Signs.pdf

Injections, Recommended Needle Size & Injection Sites

Subcutaneous (SubQ)

- Adult: 16 or 18g X ½ or ¾ in
- Foal: 20g X ½ in

Intramuscular (IM)

- Adult: 16 or 18g X 1 or 1.5in
- Foal: 20g X ¾ or 1in

Intravenous (IV)

- Adult: 18g X 1.5in
- Foal: 20g X ¾ or 1in

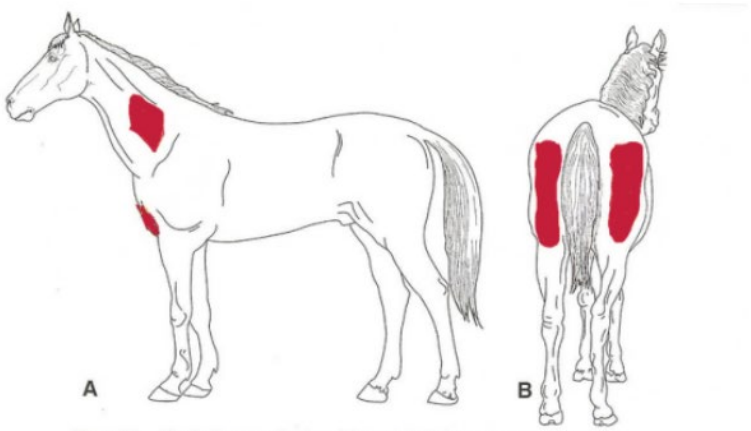
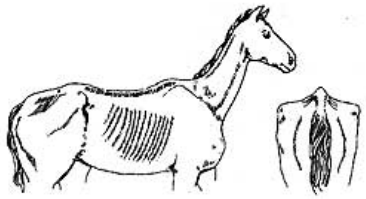
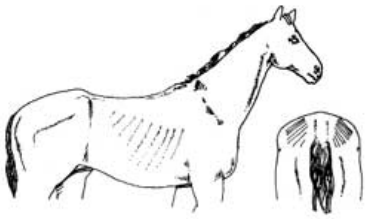
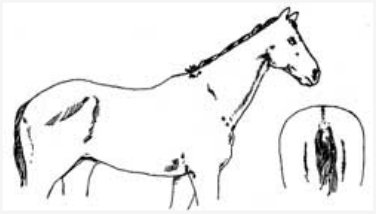
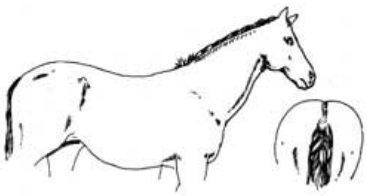
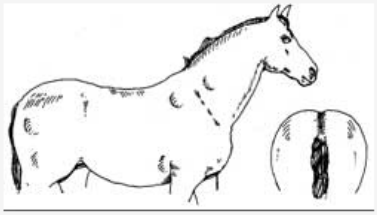
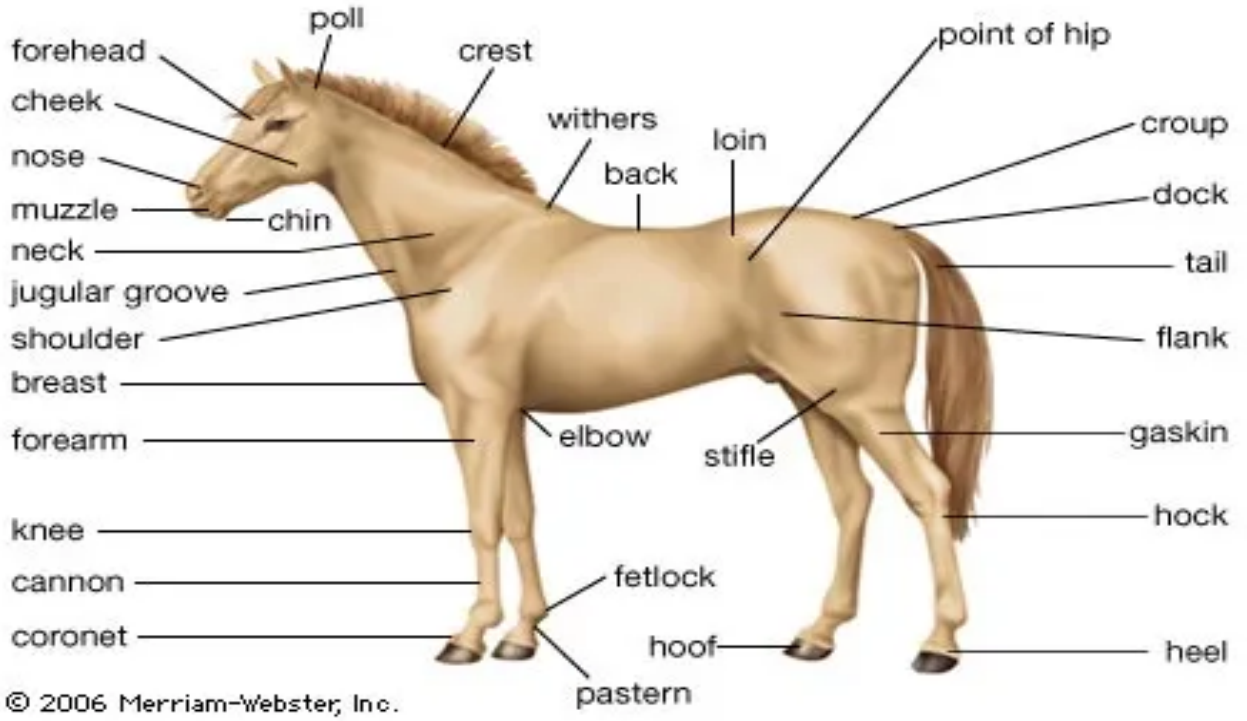


Figure 2-1 Sites for intramuscular drug delivery. **A,** Lateral view. **B,** Posterior view.

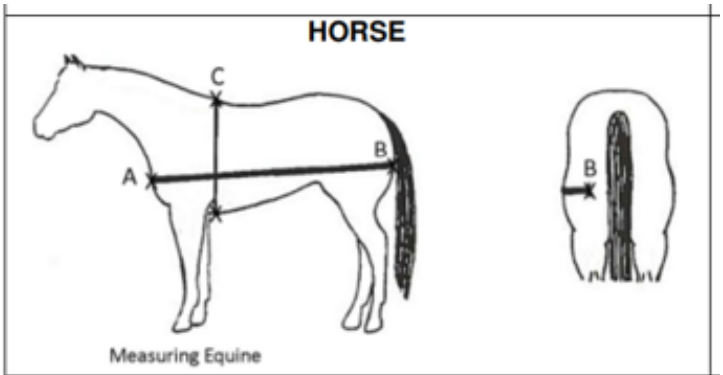
Body Condition Scoring

0 **Very poor**		• Very sunken rump • Deep cavity under tail • Skin tight over bones • Very prominent backbone and pelvis • Marked ewe neck
1 **Poor**		• Sunken rump • Cavity under tail • Ribs easily visible • Prominent backbone and croup • Ewe neck - narrow and slack
2 **Moderate**		• Flat rump either side of backbone • Ribs just visible • Narrow but firm neck • Backbone well covered
3 **Good**		• Rounded rump • Ribs just covered but easily felt • No crest, firm neck
4 **Fat**		• Rump well rounded • Gutter along back • Ribs and pelvis hard to feel • Slight crest
5 **Very fat**		• Very bulging rump • Deep gutter along back • Ribs buried • Marked crest • Fold and lumps of fat

Basic Anatomy



Weight Calculations



Measure the circumference of the animal, as shown in "distance C" in the illustration. Make sure to measure girth in relation to the location of the animal's heart.

Measure the length of the animal's body, as shown in distance A-B in the illustration.

Using the measurements from steps 1 and 2, calculate body weight using the formula HEART GIRTH x HEART GIRTH x BODY LENGTH / 330 = ANIMAL WEIGHT IN POUNDS. For example, if a horse has a heart girth equal to 70 inches and a body length equal to 78 inches, the calculation would be (70 x 70 x 78) / 300 = 1,274 lbs.

The number "330" is a constant value that is used for mature horses. Should you be measuring a yearling, use the number "301" in place of the "330", and if you are measuring a weanling, use "280" as your constant value

Vaccination Schedule

All vaccination programs should be developed in consultation with a licensed veterinarian. Vaccines listed in this table are in alphabetical order, not in order of priority use. This section is divided into CORE VACCINATIONS and RISK-BASED VACCINATIONS.

- CORE VACCINATIONS protect against diseases that are endemic to a region, are virulent/highly contagious, pose a risk of severe disease, those having potential public health significance, and/or are required by law. Core vaccines have clearly demonstrable efficacy and safety, with a high enough level of patient benefit and low enough level of risk to justify their use in all equids.

- RISK-BASED VACCINES are selected for use based on risk assessment performed by, or in consultation with, a licensed veterinarian. Use of these vaccines may vary between individuals, populations, and/or geographic regions. Refer to "*Principles of Vaccination*" for criteria used in for risk assessment.

		CORE VACCINATIONS		
Disease	Broodmares	Other Adult Horses (>1 year of age) *previously vaccinated against the disease indicated*	Other Adult Horses (> 1 year of age) *unvaccinated or lacking vaccination history*	Comments
Eastern / Western Equine Encephalomyelitis (EEE/WEE)	***Previously vaccinated:*** Annual, 4 to 6 weeks prepartum ***Previously unvaccinated or having unknown vaccination history:*** **2-dose series** **2nd dose** 4 weeks after 1st dose Revaccinate 4 to 6 weeks prepartum	Annual revaccination prior to onset of vector season.	**2-dose series** **2nd** dose 4 to 6 weeks after 1st dose. Annual revaccination; prior to onset of vector season.	Consider 6-month revaccination interval for: 1) Horses less than 5 years of age 2) Horses residing in endemic regions with extended vector seasons.
Rabies	Annual, 4 to 6 weeks prepartum OR Prior to breeding*	Annual revaccination	Single dose Annual revaccination	*Due to the relatively long duration of immunity, this vaccine may be given post-foaling but prior to breeding and thus reduce the number of vaccines given to a mare prepartum.
Tetanus	***Previously vaccinated:*** Annual, 4 to 6 weeks prepartum ***Previously unvaccinated or having unknown vaccination history:*** **2-dose series** **2nd dose** 4 to 6 weeks after 1st dose. Revaccinate 4 to 6 weeks prepartum	Annual revaccination	**2-dose series** **2nd dose** 4 to 6 weeks after 1st dose. Annual revaccination	Booster at time of penetrating injury or prior to surgery if last dose was administered over 6 months previously.
West Nile Virus (WNV)	***Previously vaccinated***: Annual, 4 to 6 weeks prepartum ***Unvaccinated or lacking vaccination history:*** It is preferable to vaccinate naïve mares when open. In areas of high risk, initiate primary series as described for unvaccinated, adult horses.	Annual revaccination prior to onset of vector season	2-dose series 2nd dose 4 to 6 weeks after 1st dose. Annual revaccination prior to onset of vector season	Consider 6-month revaccination interval for horses residing in endemic regions with extended vector seasons.

RISK-BASED VACCINES				
Disease	Broodmares	Other Adult Horses (>1 year of age) *previously vaccinated against the disease indicated*	Other Adult Horses (> 1 year of age) *unvaccinated or lacking vaccination history*	Comments
Anthrax	Not recommended during gestation	Annual revaccination	**2-dose series** **2nd dose** 3 to 4 weeks after 1st dose Annual revaccination	Do not administer concurrently with antibiotics. Use caution during storage, handling, and administration. Consult a physician immediately if human exposure to vaccine occurs by accidental injection, ingestion, or otherwise through the conjunctiva or broken skin.
Botulism *(Clostridium botulinum)*	***Previously vaccinated:*** Annual, 4 to 6 weeks prepartum ***Previously unvaccinated or having unknown vaccination history:*** **3-dose series** **1st dose** at 8 months gestation. **2nd dose** 4 weeks after 1st dose **3rd dose** 4 weeks after 2nd dose	Annual revaccination	**3-dose series** **2nd dose** 4 weeks after 1st dose **3rd dose** 4 weeks after 2nd dose Annual revaccination	Horses with history of natural exposure: A vaccination protocol should be initiated once antitoxin immunoglobulins are depleted.
Equine Herpesvirus (EHV-1 and EHV-4)	Three dose series with product labeled for prevention of EHV abortion. Administer at 5, 7, 9 months gestation. **It is recommended to also booster broodmares with a product labeled for protection against respiratory disease 4 to 6 weeks prepartum.**	Annual revaccination	*Inactivated vaccine*: Dependent upon manufacturer's product recommendation, the vaccine may be a 2- or 3- dose series 3 to 4 weeks apart. Annual revaccination *Modified live vaccine*: Dependent upon manufacturer's product recommendation, administer intramuscularly as a 2-dose series 3 to 4 weeks apart.	Consider 6-month revaccination interval for: 1) Horses less than 5 years of age 2) Horses on breeding farms or in contact with pregnant mares 3) Performance or show horses at high risk
Equine Influenza (EIV)	***Pregnant mares, previously vaccinated against influenza:*** *Inactivated vaccine:* Annually with one dose administered 4 to 6 weeks pre-partum ***Pregnant mares, unvaccinated or having unknown vaccine history:*** *Inactivated vaccine:* Dependent upon on manufacturer's product recommendation, the vaccine may be a two or three dose series with a 3 to 4-week interval between doses (IM), with the last dose administered 4 to 6 weeks prepartum	Horses with ongoing risk of exposure: 6-month revaccination interval Horses at low risk of exposure: Annual revaccination	*Inactivated vaccine:* Dependent upon on manufacturer's product recommendation, the vaccine may be a 2- or 3- dose series 3 to 4 weeks apart Annual revaccination *Modified live vaccine:* Administer a single dose (IN application). Annual revaccination	Consider 6-month revaccination interval for: 1) Horses less than 5 years of age 2) Performance or show horses at high risk
Equine Viral Arteritis (EVA)	Not recommended unless high risk. Mares in foal should not be vaccinated until after foaling and not less than 3 weeks prior to breeding. The manufacturer does not recommend use of this vaccine in pregnant mares, especially in the last two months of pregnancy.	**Breeding stallions previously vaccinated against EVA**: Annual booster every 12 months and not less than 3 to 4 weeks prior to breeding. **Breeding stallions, unvaccinated or having unknown vaccine history:** All first-time vaccinated stallions should be isolated for 3 weeks following vaccination before being used for breeding. **Teaser Stallions:** Vaccination against EVA is recommended on an annual basis. **Mares:** Vaccinate when open	**Single dose** (See comments)	Prior to initial vaccination, intact males and any horses potentially intended for export should undergo serologic testing and be confirmed negative for antibodies to EAV. Testing should be performed shortly prior to, or preferably at, the time of vaccination.
Leptospirosis	Safe for use in pregnant mares ***Previously vaccinated:*** Annual revaccination ***Previously unvaccinated or having unknown vaccination history:*** 2-dose series, 3 to 4 weeks apart	Annual revaccination	**2-dose series** 2nd dose 3 to 4 weeks after 1st dose Annual revaccination	Field safety testing has demonstrated this product is safe for use in pregnant mares

Potomac Horse Fever ***(Ehrlichia risticci)***	***Previously vaccinated:*** Semi-annual, with one dose given 4 to 6 weeks prepartum ***Previously unvaccinated or having unknown vaccination history:*** **2-dose series** **1st dose** 7 to 9 weeks prepartum **2nd dose** 4 to 6 weeks prepartum	Semi-annual to annual booster	**2-dose series** 2nd dose 3 to 4 weeks after 1st dose Semi-annual or annual booster	A revaccination interval of 3 to 4 months may be considered in endemic areas when disease risk is high.
Rotavirus	**3-dose series** **1st dose** at 8 months gestation. **2nd** and **3rd** doses at 4-week intervals thereafter	Not applicable	Not applicable	
Snake Bite	Please see guidelines for additional information	Please see guidelines for additional information	Please see guidelines for additional information	

Strangles ***(Streptococcus equi)***	***Previously vaccinated:*** *Killed vaccine:* Annual vaccination recommended 4 to 6 weeks prepartum or prior to anticipated exposure. Annual revaccination *Modified live vaccine:* Annual vaccination recommended. May consider a booster prior to anticipated exposure. Annual revaccination ***Previously unvaccinated or having unknown vaccination history:*** *Killed vaccine:* **3-dose series** administered parenterally at 3-week intervals. Annual revaccination One dose may be administered 4 to 6 weeks prepartum or prior to anticipated exposure. *Modified live vaccine:* **2-dose series** administered intranasally at a 2 to 3-week interval. Annual revaccination	Annual revaccination based on risk	*Killed vaccine:* **3-dose series** administered parenterally at 3-week intervals Annual revaccination prior to anticipated exposure *Modified live vaccine:* **2-dose series** administered intranasally at a 2 to 3-week interval Annual revaccination prior to anticipated exposure	Vaccination is not recommended as a strategy in outbreak mitigation. Both killed and modified live vaccines may be administered to broodmares. If the goal is to boost colostral antibodies, administer the killed vaccine 4 to 6 weeks prepartum. SeM Antibody ELISA can be used before vaccination with the goal to identify individuals at increased risk of developing complications from vaccinations (those with titers >1:3200).
Venezuelan Equine Encephalitis (VEE)	Previously vaccinated: Annual revaccination Previously unvaccinated or having unknown vaccination history: 2-dose series, 3 to 4 weeks apart	Annual revaccination based on risk	2-dose series, 3 to 4 weeks apart	VEE is a foreign animal disease in the United States. Vaccination is recommended only for horses living in geographic areas at risk for potential incursion, such as southern border states, or for horses intending to travel to countries where the disease is present.

Source: Vaccinations for Adult Horses were developed by the American Association of Equine Practitioners (AAEP) Infectious Disease Committee. These guidelines and charts were reviewed and updated by the committee & Vaccination Guidelines Subcommittee and approved by the Board of Directors in 2023. Updated 2026. *Please note that updates to these guidelines and charts may occur online at any time and should always be referenced there for the most current version at [www.aaep.org.](http://www.aaep.org)*

Horse Parturition

It is critical to understand the normal progression of events during parturition. Abnormal events can then be identified and intervention provided as needed. Parturition is divided into 3 stages.

Stage I is characterized by signs of abdominal discomfort and restlessness due to uterine contractions. Patches of sweat on the flank and behind the elbows usually appear a few hours before foaling. The uterine contractions increase in frequency and intensity, causing the fetus to engage into the cervix and pelvic canal. The fetus rotates from a dorsopubic to a dorsosacral position before expulsion. Mares may roll during the first stage, which is thought to facilitate rotation of the fetus.

Increasing pressure in the uterus causes the chorioallantois to protrude through the internal os of the cervix. The chorion over the cervix is smooth—it does not have microvilli and is referred to as the cervical star. The chorioallantois usually ruptures at the cervical star, and the release of the tea-colored allantoic fluid marks the end of the first stage of parturition. In lay terminology, this event is referred to as the mare "breaking her water."

Stage II starts with the rupture of the chorioallantois and ends when the fetus is expelled. Second stage labor usually lasts 15–30 minutes. When the fetus engages the cervix, the Ferguson reflex occurs and stimulates the mare to have abdominal contractions. The allantoic fluid lubricates the canal, facilitating expulsion of the amnion and fetus. Vaginal distention causes release of oxytocin and further myometrial and abdominal contractions. The amnion appears at the vulvar lips as a whitish, fluid-filled membrane. The straining efforts of the mare consist of 3 to 4 strong contractions, followed by a short period of rest. During the actual expulsion of the foal, the mare usually assumes lateral recumbency with all 4 limbs extended.

The foal is normally delivered in an anterior, longitudinal presentation and dorsosacral position with the head, neck, and forelimbs extended. One front hoof of the foal usually precedes the other hoof by ~15 cm, facilitating passage of the elbows and shoulders through the pelvic canal. The foal is usually born with the umbilical cord intact and covered by the amnion, which is ruptured by movements of the mare or foal. If amnion remains over the foal's nose, an attendant should remove it to prevent suffocation. If left undisturbed, the mare may lie for some time with the foal's hindlimbs in the vagina. If the foal has not been delivered within 30 minutes of the rupture of the chorioallantois and release of the allantoic fluid, obstetric intervention is indicated.

Stage III involves expulsion of the fetal membranes. Normally, the fetal membranes pass rapidly (within 3 hours) after delivery of the foal. The weight of the amnion and cord may help the chorion separate from the endometrium. Progressive traction by the amnion and moderate uterine contractions originating at the tip of the horn cause complete separation of the chorioallantois, which may become inverted during the process. The mare may stand with the amnion hanging from the vulva at the level of the hocks or below. If the mare kicks at the hanging membranes, endangering the foal, the exposed membranes should be tied in knots to shorten the length to above the hocks.

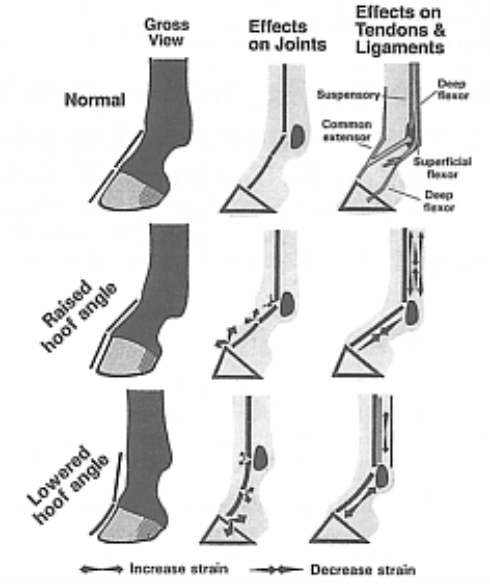
If the fetal membranes have not been passed by 3 hours after parturition, oxytocin (20 IU, IV or IM) should be administered at 15- to 30-minute intervals until they pass. If fetal membranes are still retained at 8 hours after foaling, therapy for retained placenta should be instituted.

https://www.merckvetmanual.com/management-and-nutrition/management-of-reproduction-horses/parturition-in-horses#Stages-of-Parturition_v3313600

https://horses.extension.org/feeding-the-newborn-foal/#:~:text=Thoroughly%20wash%20and%20rinse%20the,replaced%20with%20the%20dam's%20milk.

https://extension.okstate.edu/fact-sheets/foaling-management-and-care-of-the-nursing-foal

Foot Trimming



The usual prescription for hoof angle is to make the hoof angle and the pastern angle parallel to each other.

When we lower a horse's heel, we will also move the fetlock joint forward and upward in space. This occurs because of the structural relation of the DDFT to P3 and the back of the cannon bone via the inferior check ligament. So if a horse's hoof angle is broken forward, we can correct the alignment by lowering the heel. The opposite is true if the hoof angle is broken backward.

Source: https://sawtoothequine.com/correct-hoof-angle/

Sheep (Ovine)

Terminology

- Ewe: female sheep that has given birth
- Ewe lamb: young female sheep that has not given birth
- Ram: uncastrated male sheep
- Ram lamb: young uncastrated male sheep
- Wether: castrated male sheep
- Cryptorchid: infertile male sheep when one or both testicles remain in the body cavity and do not descend into the scrotum

Vitals

Normal Rectal Temperature (Fahrenheit)

- Adult: 101-104.0
- Lambs: 102.5-104

Normal Resting Heart Rate (Beats per minute)

- Adult: 70-80
- Lambs: 120-160
- Use a stethoscope or your hand, placing it on the left side of the chest wall until you hear or feel the heartbeats. Count them for one full minute. (There are usually two different sounds when using the stethoscope, count the louder first sound only.)

Normal Resting Respiratory Rate (Breaths per minute)

- Adult: 16-34
- Lambs: 30-70

Capillary Refill Time

2 seconds or less

Skin Pinch Test

Skin ‘snaps’ back, 1 second

Breeding

- Seasonally polyestrous. Peak sexual activity occurs during fall months (shorter days)
    - Hair sheep can cycle year round
- Estrus cycle: average 17 days but can vary between 14 and 19 days
    - Average duration of estrus is 24 to 36 hours, with ovulation occurring toward the end of estrus or approximately 24 hours after the onset of estrus
- Ewes reach puberty at 5 to 12 months, depending on breed, nutrition, and date of birth.
- Natural mating
- AI – frozen semen

- Heat synchronization
    - Hormones
    - CIDR™ (controlled internal drug releasing device). CIDR™s are T-shaped flexible silicone and nylon devices containing progesterone.

Lambing

- Gestation Length: 143-157 days
    - There can be significant variation between breeds
- Litter Size: Ewes will typically have twins, but they can be known to have up to four lambs at a time
- Lamb Size: Varies by breed, but newborns (standard size) usually weigh between 8-12 pounds
- Lambing can typically take 5 hours, from cervical dilation to the water bag to lambing
- Assist lambing if no progress is made by the lamb 30 minutes after the water bag breaks

Rumen Motility

The rumen is always contracting and moving. Healthy animals will have one to two rumen contractions per minute. The contractions mix the rumen contents, bring microbes in contact with new feedstuffs, reduce flotation of solids, and move materials out of the rumen. Lack of or a decrease in frequency of rumen movements is one way of diagnosing sick animals.

Injections, Recommended Needle Size & Injection Sites

Subcutaneous (SubQ)

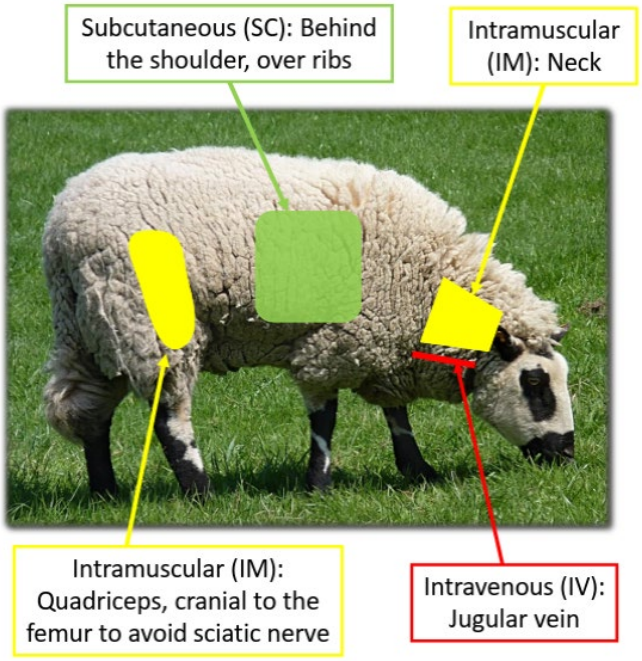
- Adult: 18 or 20g, ½ or ¾ in
- Lamb: 20 or 22g, ½ in

Intramuscular (IM)

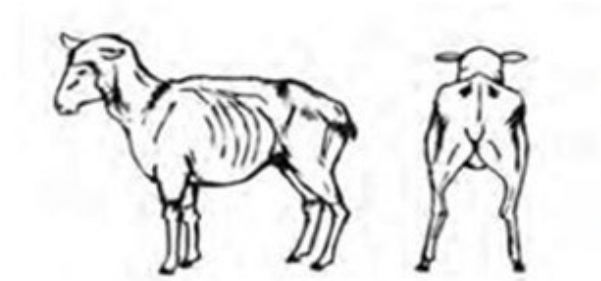
- Adult: 18 or 20g, ¾ or 1in
- Lamb: 20 or 22g, ¾ in

Intravenous (IV)

- Adult: 20g, 1in
- Lamb: 20 or 22g, ¾ or 1in

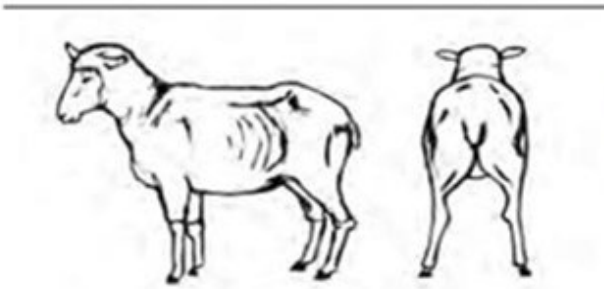


Body Condition Scoring



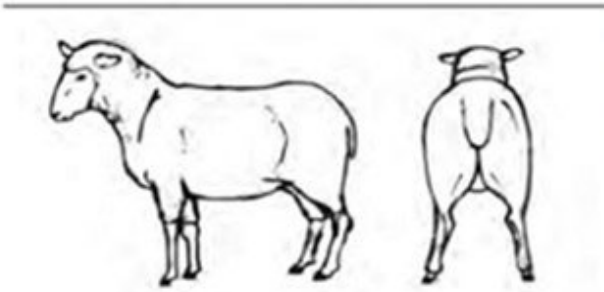
Condition score 1

Appearance angular and narrow
Backbone raised and sharp
Hollow behind ribs
Tail feels bony
Neck bones prominent



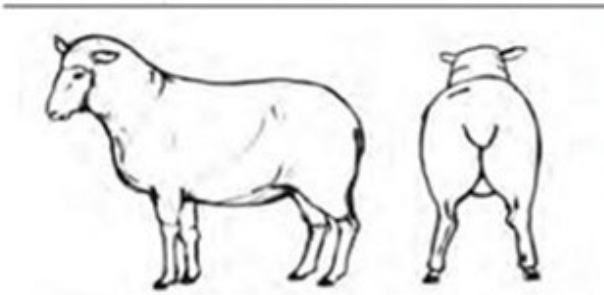
Condition score 2

Backbone raised but smooth
Ribs are easily felt
Tail bone easily detectable
Thin neck



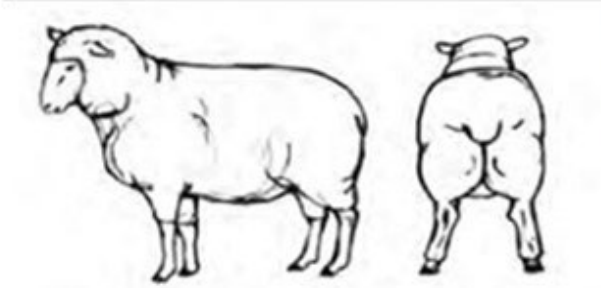
Condition score 3

Backbone slightly raised
Ribs smooth, can just be felt
Tail bones barely detectable



Condition score 4

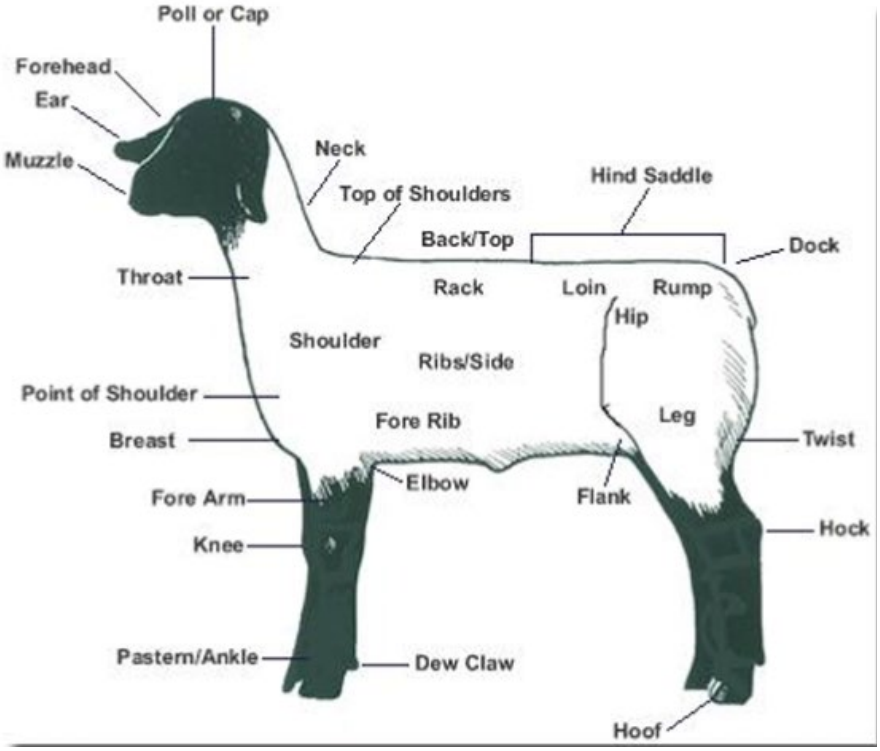
Appearance well rounded
Backbone can just be felt
Ribs are covered
Tail firm and rounded



Condition score 5

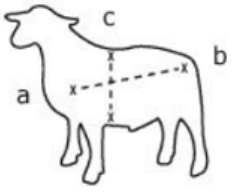
Appearance very well rounded
Backbone barely detectable
Ribs cannot be felt
Tail fat and broad

Basic Anatomy



Calculating Weight

SHEEP/GOAT



Measuring sheep.

Measure the circumference of the animal, as shown in distance C in the illustration. Make sure to measure girth in relation to the location of the animal's heart. On a sheep, ensure an accurate measurement by compressing the sheep's wool so that the circumference reflects that of the body and does not include that of the body plus the wool.

Measure the length of the animal's body, as shown in distance A-B in the illustration. From point of shoulder to pin bone.

Using the measurements from steps 1 and 2, calculate body weight using the formula HEART GIRTH x HEART GIRTH x BODY LENGTH / 300 = ANIMAL WEIGHT IN POUNDS.

For example, if a sheep has a heart girth equal to 35 inches and a body length equal to 30 inches, the calculation would be (35 x 35 x 30) / 300 = 122 lbs.

Vaccination Schedule

Stage of production	**Timing**	**Recommended vaccines/health management**	**Diseases covered**	**Optional vaccines***
Pregnant sheep and goats	2–4 weeks prior to lambing or kidding	• *Clostridium perfringens* types C and D and tetanus. Will need to use cattle vaccines labeled safe for sheep and goats. • Topical external parasite control (permethrin)	*Clostridium perfringens* types C and D and tetanus Keds and lice in sheep	
Kid goats	At lambing or kidding	• Topical and drench wormers to dams	Prevents internal parasite infestation	SE/vitamin E can help prevent white muscle disease
New lambs	Lambs 2 weeks of age	• Dock tails and castrate	•	300 I.U. tetanus antitoxin, if dam was not vaccinated during gestation
	30 days after lambing or kidding. Booster at 45 days (2 weeks later).	• Clostridium perfringens types C and D antitoxin	Enterotoxemia	Ovine ecthyma for soremouth
Ewes and does	60–30 days pre-breeding	• *Campylobacter fetus-jejuni* bacterin	Vibriosis (late-term abortions) Chlamydia (late-term abortions; vaccine can be	

Stage of production	Timing	Recommended vaccines/health management	Diseases covered	Optional vaccines*
		• *Chlamydia psittaci* ewe vaccine • Clostridial 8-way (once) • Caseous lymphadenitis (CL)	used in both sheep and goats) Eight clostridial strain bacterial diseases CL, a contagious bacterial disease that causes skin lesions and abscesses	
Bucks and rams	30–60 days pre-breeding	2. Clostridial 8-way • Anthelmintic (de-wormer)	Eight clostridial strain bacterial diseases Prevents parasite infestation	

Source: New Mexico State University Extension

Sheep Parturition

Parturition in sheep (lambing) typically occurs 144–152 days post-breeding, characterized by a 3–4 hour first stage (cervical dilation), followed by active labor and delivery within 1–2 hours of the "water bag" appearing. Key signs include udder filling 24 hours prior, restlessness, nesting, and a 30–60 minute expulsion of the placenta.

Key Timeline and Stages of Sheep Parturition

- Pre-Parturition (1–4 weeks before):
    - Udder Development: The udder begins to fill and enlarge about 4 weeks before lambing.
    - Physical Changes: The vulva becomes swollen, soft, and, in some cases, a slight, clear, or light-colored discharge appears.
    - Separation: Ewes may separate themselves from the flock and become restless, pacing, or pawing at the ground.
- Immediate Pre-Parturition (24 hours before):
    - "Bagging Up": The udder becomes very firm, and teats fill with colostrum.
    - Behavioral Changes: The ewe may lose interest in food or appear agitated.

- Stage 1: Dilation of the Cervix (3–4 hours):
    - Uterine contractions begin, but the lamb is not yet visible.
    - The ewe is typically very restless, moving between lying down and standing.
- Stage 2: Expulsion of the Fetus/Lambing (1–2 hours):
    - Water Bag Appears: The amniotic sac (water bag) becomes visible, signaling the start of active labor.
    - Delivery: The lamb is typically born within 30 minutes to 1 hour after the water bag ruptures.
    - Multiple Births: The process repeats for each subsequent lamb, with generally less than 1 hour between them.
- Stage 3: Expulsion of the Placenta (1–3 hours after delivery):
    - The placenta (afterbirth) is typically expelled 30 to 60 minutes after the last lamb is born.
    - If the placenta is not passed within 24 hours, it may indicate a problem.

Crucial Considerations

- Assistance: If active straining occurs for more than an hour (or 2 hours for young ewes) without progress, intervention may be necessary.
- Gestation: While the average is 147 days, it can range from 144 to 152 days.
- Monitoring: Ewes should be checked 1–2 weeks before the expected date, with increased frequency (4+ times per day) as the date approaches.

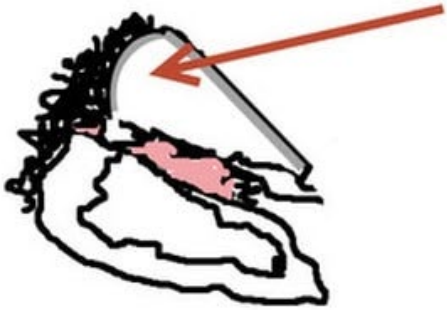
https://www.uaex.uada.edu/farm-ranch/animals-forages/sheep-goats/small-ruminants-blog/posts/lamb-kidding-season.aspx#:~:text=When%20do%20I%20know%20the,swollen%2C%20and%20filled%20with%20colostrum

Hoof Trimming

How to Trim a Sheep Hoof

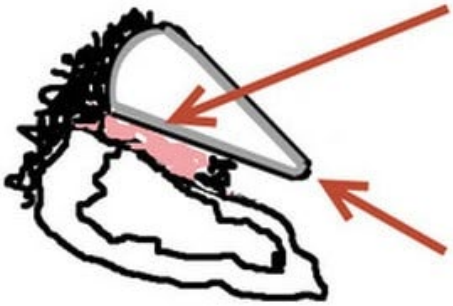
STEP ONE

Begin by trimming excess growth off the outside of the hoof. Stop when you begin to hit lighter coloration and when the hoof is flush with the pad.



STEP TWO

Take the same approach along the back of the hoof - trim the excess growth off so that the edge of the hoof is smooth and flush with the bottom of the hoof.



STEP THREE

Next, carefully clean off the inside of the hoof. Be careful to trim any small pockets of growth so bacteria don't have a place to take hold in the hoof.

STEP FOUR

Carefully trim the tip of the hoof so that it is smooth and flush. Be careful not to trim too far or the hoof may bleed. Stop when there is no excess growth and when lighter colored hoof appears.

FINAL STEP

Repeat this process on the other side of the hoof so that both sides are clean, well-trimmed and even with no remaining weak pockets where bacteria could take hold.

RaisingSheep.net

Image courtesy of www.RaisingSheep.net

You are welcome to share this on your site but please credit us as the original source!

Swine (Porcine)

Terminology

- Sow: female pig that has given birth
- Gilt: female pig that has not given birth
- Boar: intact male pig
- Barrow: castrated male pig
- Farrowing: giving birth
- Baby: pig, piglet
- Feeder / weaner / grower: pig from weaning to finisher (25 – 60 pounds)
- Finisher: pig from feeder to butchering (60 – 300+ pounds)

Vitals

Temperature

- Baby pig: can't control body temp very well
- Normal: 102.5 F
- Range: 101.5-103.5 F
- Hot days: 103.5 + F
- Sow temp drops prior to farrowing
- Sow temp rises post farrowing

Heart Rate

- Baby pig: 200-250 beats per minute (bpm)
- Weaned: 90-100 bpm
- Grower: 80-90 bpm
- Finisher: 75-85 bpm
- Sow: 70-80 bpm
- Boar: 70-80 bpm

Respiratory Rates

- Newborn: 50-60 breaths/min
- Weanling: 25-40 breaths/min
- Grower: 25-35 breaths/min
- Finisher: 25-35 breaths/min
- Sow: 13-18 breaths/min
- Boar: 13-18 breaths/min
- Farrowing sow: 35-45 breaths/min
    - In swine, the heart must be palpated directly to feel a pulse. Researchers and others sometimes use heart rate monitoring devices when measuring heart rates in swine.

Capillary Refill Time

2 seconds or less

Skin Pinch Test

Skin 'snaps' back, 1sec

Breeding

- Non-seasonal polyestrous
- 21-day cycle
- Puberty 4-8 months
- Natural mating
- AI – fresh semen
- Heat synchronization: Matrix
  - an orally active progestin that is approved for use in synchronizing estrus in gilts
- Induction of puberty: PG600
  - induce and synchronize puberty in gilts, typically by promoting follicle growth and ovulation

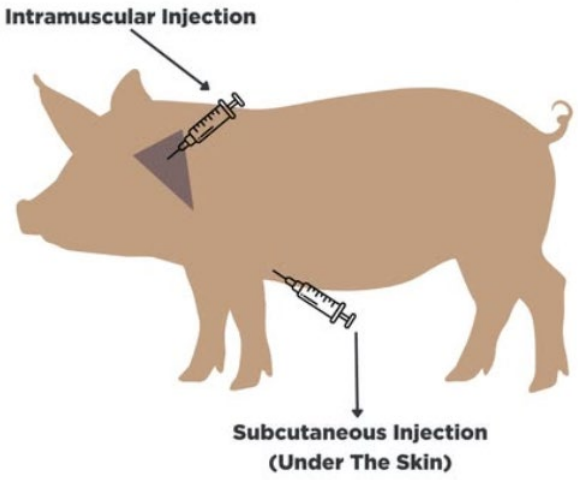
Farrowing

- 114-116 days gestation
- Temperature decrease 24 hours prior
- Milk/colostrum prior to or at parturition
- Piglets can come forward or backward
- Usually one every 15 minutes
- Take 2-4 hours to finish
- Retained placenta = retained piglet usually

Sources: Shipley, University of Illinois, California Veterinary Emergency Team

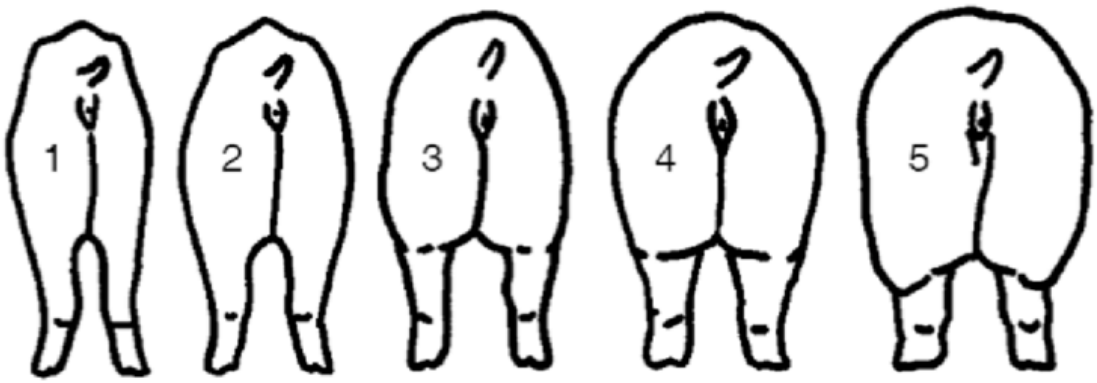
Injections, Recommended Needle Size & Injection Sites

TABLE FS.3 RECOMMENDED NEEDLE SIZE FOR IM AND SQ INJECTIONS				
	Intramuscular (IM) Injections		Subcutaneous (SQ) Injections	
	Gauge	Length	Gauge	Length
Baby Pigs	18 or 20	5/8" or ½"	18 or 20	5/8" or ½"
Nursery	16 or 18	3/4" or 5/8"	16 or 18	1/2"
Finisher	16	1"	16	3/4"
Breeding Stock	14 or 16	1" or 1½"	14 or 16	1"



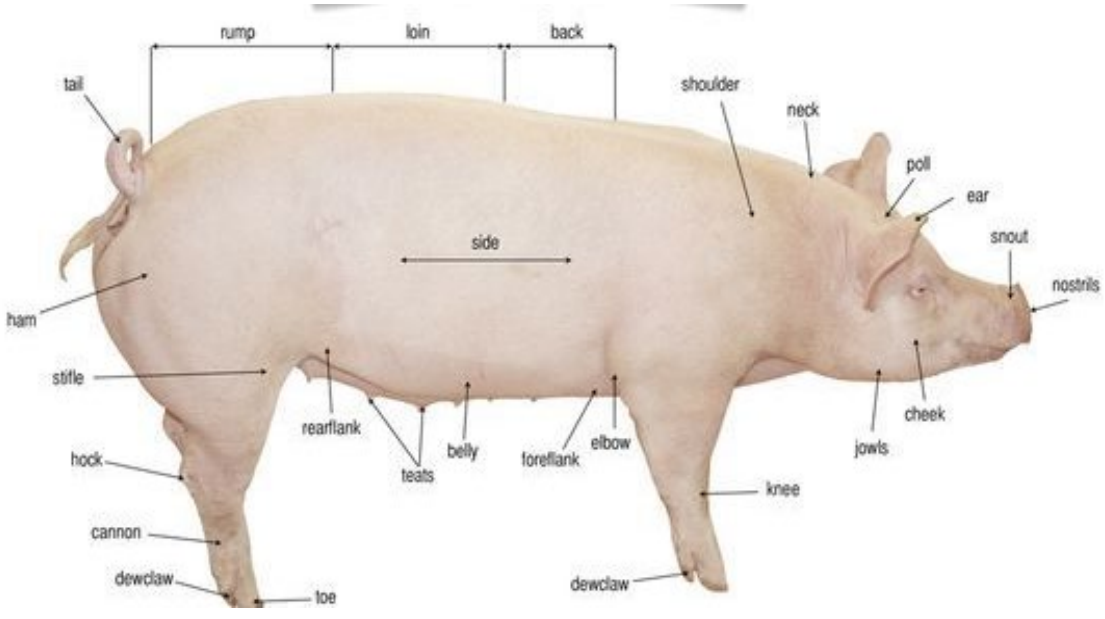
Source: PQA Plus Handbook 2025 Version 6.0

Body Condition Scoring



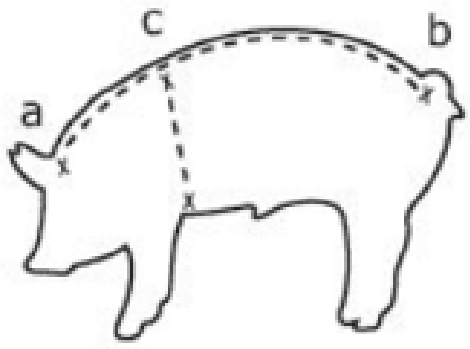
Score	Condition	Detection of ribs, backbone, "H" bones, and "pin" bones
1	Emaciated	Obvious
2	Thin	Easily detected with pressure
3	Ideal	Barely felt with firm pressure
4	Fat	None
5	Overly fat	None

Basic Anatomy



Calculating Weight

PIGS



Measuring swine.

Measure the circumference of the animal, as shown in "distance C" in the illustration. Make sure to measure girth in relation to the location of the pig's heart.

Measure the length of the animal's body, as shown in distance A-B in the illustration. The pig must be standing or restrained in the position shown in the illustration for the calculation to be nearly accurate.

Using the measurements from steps 1 and 2, calculate body weight using the formula HEART GIRTH x HEART GIRTH x BODY LENGTH / 400 = ANIMAL WEIGHT IN POUNDS. For example, if an adult pig has a heart girth equal to 45 inches and a body length equal to 54 inches, the calculation would be (45 x 45 x 54) / 400 = 273 lbs.

If the hog or sow weighs less than 150 lbs., add 7 lbs. to the final answer.

Vaccination Schedule

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For additional information, visit extension.msu.e

Stage	Vaccine (pathogen)	Timing (vary by system)	Other considerations
Gilts	• Flu/PCV2/Myco • Parvo/Lepto/Erysipelas • E.coli/cCostridium/Pasteurella • Ileitis and Salmonella	• Every 6 months to nonpregnant pigs • 5 and 3 weeks before breeding • 3 and 6 weeks before farrowing • 3 weeks old or older	• Commercial vaccines may be available as combination product.
Sows	• Flu/PCV2/Myco • Parvo/Lepto/Erysipelas • E.coli/Clostridium/Pasteurella • Ileitis and Salmonella	• Every 6 months to nonpregnant pigs • 4 weeks before breeding • 3 and 6 weeks before farrowing • Every 6 months	
Boars	• Flu/PCV2/Myco • Parvo/Lepto/Erysipelas	• Every 6 months • Every 6 months	
4-H pigs (terminal show) & feeder pigs	• Flu/PCV2/Myco • Erysipelas • Ileitis and Salmonella	• 3 weeks old or older; 2nd dose may be needed for flu and Myco • 3 weeks old or older • 3 weeks old or older	• Assumes sow was vaccinated for Myco and Erysipelas • Water-based available
Show pigs (High risk due to travel to multiple shows)	• Flu/PCV2/Myco • Erysipelas • Ileitis and Salmonella • PRRS	• On arrival and 6 weeks before show • 3 weeks old or older • 3 weeks old or older • One dose	

Situational or Preferential Swine Vaccines to Consider

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Vaccine (pathogen)	Stage and timing (approximate)	Other considerations
PRRSv (porcine reproductive and respiratory syndrome virus)	Piglets at weaning, prior to moving into nursery/grower unit	If you are in an area or in contact with pigs or herds that are PRRSv positive, you might vaccinate to protect grower pigs from respiratory form of PRRSv.
PRRSv	Vaccinate the entire herd simultaneously.	If you are in an area that your sow herd is at a high risk to become exposed to PRRSv, consider vaccinating the entire breeding herd (sows, gilts, and boars) with 2 doses of commercial vaccine. All incoming gilts or pigs must be vaccinated before combining with herd.
PEDv (porcine epidemic diarrhea virus)	No vaccine	If your herd is positive for PEDv, consider feedback at 2 and 4 weeks prior to farrowing.
TGEv (transmissible gastroenteritis virus)	No vaccine	If your herd is positive for TGEv, consider feedback at 2 and 4 weeks prior to farrowing.
Atrophic rhinitis	Piglets: 1 and 4 weeks	If administering to gilts: 1st dose 6 months before breeding If administering to sows: 4 and 2 weeks before farrowing. Intranasal vaccine available for young pigs.
APP (actinobacillus pleuropneumoniae)	No vaccine	Effective commercial vaccines are unproven. Sound management and antibiotics (if needed) recommended.
GPS (e.g., Parasuis)	May depend on signs	Vaccines such as Parasail require the pigs to be free of antibiotics before and after administration.
Streptococcus suis	Sows pre-farrow	Only autogenous vaccines are available for this pathogen.

Swine Parturition

Farrowing is one of the most critical stages of the reproductive cycle, and it is important to have a good understanding of the normal farrowing process. Prompt detection and correction of problems can prevent sizable losses due to baby pig death at or around the time of farrowing. Extra care during this phase can impact the overall profitability of the operation.

Pre-Farrowing

Many types of farrowing pens or huts may be used, depending on what seems best adapted to the conditions on the farm. Pens or huts should be oriented with the door away from prevailing winds, and to take advantage of sunlight or shade in the appropriate season. The size should be sufficient for the sow to lie down on her side fully extended, with room for a large litter of growing piglets. Pen designs often include a guardrail or slatted space where piglets can escape the risk of crushing when the sow lies down. Maximum pen size depends on the climate and management practices. Smaller farrowing pens are better for retaining heat, while larger, taller pens are better for preventing the pen from getting too hot in warm seasons and climates. A hanging cover, such as burlap over the door to the pen, can be used in cold weather to help keep out the cold. Give consideration to the need to use artificial heat if winter lingers longer than expected.

Many breeders prefer to isolate the sow where she will not be bothered by other sows; however, some heritage breed pigs will naturally assist new mothers. If farrowing will take place where other pigs are present, keep a close watch until it is clear whether the culture of the herd is to help or hinder. Some heritage breeds in outdoor systems prefer to build their own nest. Use of the huts can be encouraged by having them in place with a thin layer of straw or other absorbent nesting materials at least 5 days before the expected farrowing date. If the hut is reasonably portable without a floor and the sow has begun nesting, the hut can be put in place over the nest.

Clean farrowing quarters greatly reduce the incidence of disease in newborn piglets. If farrowing is inside of a building, the area can be thoroughly cleaned and disinfected a few days before the sow enters. In outdoor systems, huts should be cleaned, disinfected and moved to a clean, dry area. Treat pregnant females for internal and external parasites about two weeks prior to farrowing. Wash the sows with warm, soapy water and move them to the farrowing quarters about 4 to 5 days prior to the expected farrowing date.

Phases of Farrowing

Normal farrowing is a continuous process. For descriptive purposes it is usually divided into three stages.
Stage 1. Preparatory Stage. This stage begins with muscular contractions and ends with complete cervical dilation that allows the fetuses to enter the pelvic or birth canal. The only outward signs of this stage are abdominal discomfort and restlessness.
Stage 2. Fetal Expulsion. This stage begins when the first fetus enters the pelvic canal, with visible abdominal contractions and ends with delivery of the last fetus. The time period from the first observed

contractions until birth of the first pig is usually one to three hours, but may vary from several minutes to several hours.
Stage 3. Expulsion of Placental Membranes. Stage 3 completes the farrowing process. In the majority of farrowings, the placental membranes (afterbirth) are passed in one mass within one to two hours after the last pig is born. On occasion, a clump of placenta may be expelled before the last pig is born. Occasionally a piglet is born wrapped in its placenta.

Outward Signs of Imminent Farrowing

If farrowings are to be attended or if special management changes are to be made (i.e., provision of supplemental heat) it is important to be able to predict, within a few hours, when a sow is about to farrow. In situations where breeding dates are known, gestation length can be of use in predicting the time of farrowing. However, the gestation length of sows can range from 109 to 121 days. Some commonly observed signs and when they often show up are listed below. These may be useful in management decisions, especially if breeding dates are not known or if attending farrowing is important.
Signs that farrowing is imminent:

1. Abdominal contractions (typically sow is in labor)
2. Nest building/restlessness (starts 2-3 days before farrowing)
3. Change in rectal temperature (increases 1 to 2 °F)
4. Expulsion of blood stained fluid from the vulva (typically sow is in labor)
5. Milk letdown (droplets often expressed for 2-3 days, if streams of milk expressed, farrowing will occur within 12 hours)
6. Expulsion of fetal fecal pellets from the vulva (sow is in labor)
7. Tail twitching (piglet is in birth canal)

Sow Behavior during Farrowing
Increased activity of sows during Phase 2 can have implications upon piglet survival because of the increased risk of trampling or overlying (sow lying on piglets). Newborn pigs are likely to be in close contact with the sow where they are at risk when the sow rolls from side to side or stands and lays down. As farrowing nears completion the sow normally becomes more docile and less active.

Duration of Farrowing and Time Interval between Pigs
Duration of farrowing, or time interval from the birth of the first pig to the last pig, may range from one to eight or more hours. There is a relationship between duration of farrowing and number of stillborn pigs in the litter. Sows which complete farrowing within two to two and one-half hours tend to have fewer stillborns than sows that have a longer duration. The average interval between live pigs is about 15 minutes, though they can come simultaneously or several hours apart. Recording birthing ease can be valuable when making culling decisions. A gilt with high incidence of farrowing difficulty or a sow with a high proportion of stillborn piglets, for example, should be carefully evaluated before giving them another chance to breed.

Presentation of Pigs at Birth

Pigs are born in both anterior (head) and posterior (tail) first positions in about equal numbers. There is no relationship between the type of presentation and the frequency of stillbirths of other farrowing problems. The umbilical cord of most pigs remains attached to the placenta until the pig is delivered. After delivery the cord pulls apart, and the placenta usually remains in the uterus until farrowing is complete. However, as farrowing progresses, the incidence of ruptured umbilical cords increases, which contributes to an increased number of stillbirths toward the end of farrowing.

Pigs are born according to their location in the uterine horns. The pig closest to the uterine body is born first. Pigs in the left and right horn are delivered at random. Pigs may be born alternately between horns; i.e., two or three may be delivered from one horn and then two or three from the other, or occasionally all pigs may be expelled from one horn before any are expelled from the other horn.

Attended Farrowings

Studies have shown that attended farrowings result in at least an extra pig weaned per litter. Of course it may not be practical or economical to provide for supervised farrowings around the clock. However, by understanding what is “normal” and what is “abnormal”, it is often possible to save pigs during the normal working hours. Examples include: removing the placenta from newborn piglets to prevent suffocation, moving a newborn piglet that is caught under the sow or one that has wandered to a cool corner of the farrowing area, assisting a newborn piglet that has the umbilical cord around its neck, and providing assistance to piglets that are having difficulties in obtaining their first breath of air. Oxytocin, a hormone, may be helpful in sows experiencing a difficult birth. Oxytocin stimulates contractions of the uterine muscles and helps in expelling the piglets. Massaging the udder can release endogenous oxytocin and is a preferred first attempt at increasing contractions, though oxytocin is also available to be used as an injectable. Never administer oxytocin until it is determined that there are no pigs stuck in the pelvic birth canal.

Stillborn Pigs

The incidence of stillborn pigs in many herds is five to ten percent of all pigs farrowed. Stillbirths are usually classified as prepartum (before farrowing) or intrapartum (during farrowing). Intrapartum deaths are the major cause of stillbirth pigs. Below are some observations related to stillborn pigs resulting from intrapartum complications.

1. Stillborn pigs have the outward appearance of live littermates, but their lungs do not float in water.
2. They are usually the result of noninfectious causes.
3. Stillbirths increase as duration of farrowing increases. More stillbirths occur toward the end of farrowing, in the last third of the litter. This is especially true for older sows and for larger litters.
4. Pigs located at the ovarian end of the uterine horn have a higher incidence than those located near the uterine body because they are born later in the birth order. More pigs located at the ovarian end are born with ruptured umbilical cords.

5. Pig fetuses have a low tolerance for anoxia (lack of oxygen). Brain damage or death can occur within five minutes after umbilical rupture or impeded umbilical blood flow (crimped cord). Many pigs born weak have suffered from anoxia, and their survival rate is low.
6. Stillbirths tend to be either the lightest or heaviest pigs.
7. In one study, the average time interval between one live pig until the next live pig was 17 minutes, and the time interval from a pig to a stillborn pig was 47 minutes.

Post-Farrowing Pig Behavior

Following birth, pigs get to their feet and instinctively make attempts to reach the udder within minutes. Most pigs suckle within 45 minutes following birth. Within a few hours, piglets begin to establish a "teat order". This is a tendency for larger piglets to select or "claim" front teats while smaller piglets are relegated to the rear teats, and by 2-3 days post-farrowing piglets will nurse exclusively their select teat the remainder of lactation. Front teats are more popular for the following reasons:

1. Greater security. Piglets are safer from kicking.
2. Front teats secrete more milk.
3. Milk "let-down" may be more easily stimulated.
4. Spacing between teats is generally greater.
5. Teat length is longer.
6. Front teats are more available and better exposed.

Remember there is a considerable difference in size between the sow and her piglets, so care should be taken to reduce crushing. Creating a warm creep area away from the sow, using 'guardrails' in the farrowing pen or a farrowing crate, and keeping piglets dry and free of drafts help save pigs. Keeping the area dry can dramatically reduce bacterial contamination. Bacterial loads lead to increased incidence of scours, and piglets can become dehydrated quickly once scouring. The sow should be fed a highly palatable diet balanced for her expected level of milk production. The goal is to work her up to full feed rather quickly, and feeding sows more frequent meals can help achieve that. Assuring the sow also has ample cool, fresh water will go a long way to increasing feed intake. Remember that she will prefer a temperature of 55-65 ºF, while for the first few days her piglets are more comfortable in the 90-95 ºF range. Sows will normally lay on their side once piglets are born. When it is time to nurse, about once hourly, they initiate a distinctive grunting that alerts the piglets. The stockperson needs to recognize what is normal so they know when it is time to call for help. In many areas of the country help is available from local Extension offices, the herd veterinarian or other farmers. Some additional resources to consider reading are listed below.

Natural farrowing behavior of the sow and her piglets https://porkgateway.org/resource/natural-farrowing-behavior-of-the-sow-and-piglets/

How to Raise Pigs. P. Hasheider, 2008. Voyageur Press.

Storey's Guide to Raising Pigs. K. Klober, 2008. Storey Press.

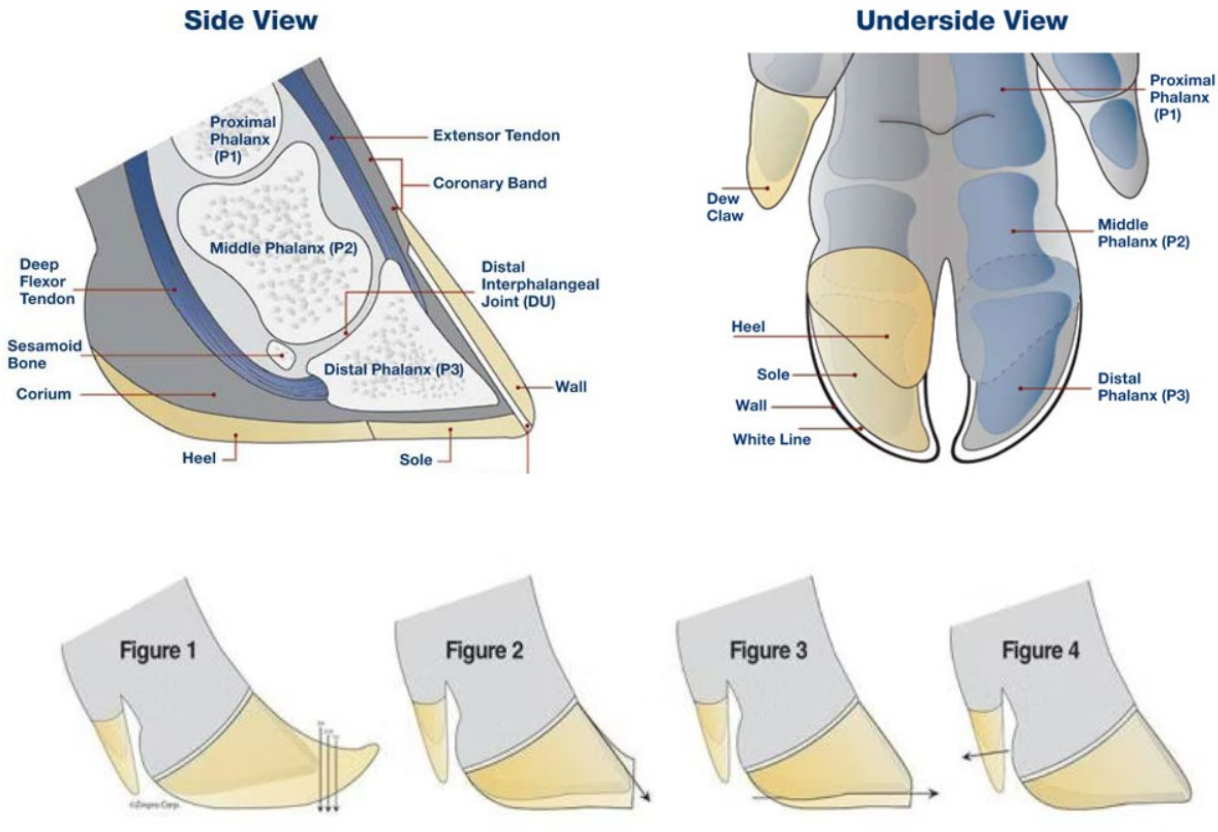
Stockmanship. Lammers, P. J.., D. R. Stender, and M. S. Honeyman, 2007. Niche Pork Production publication NPP710. Available from: http://www.ipic.iastate.edu/publications/710.Stockmanship.pdf

Care of the sow during farrowing and lactation. Pork Industry Handbook, PIH 46

Baby pig management- birth to weaning. Pork Industry Handbook, PIH 18
https://livestockconservancy.org/heritage-swine/heritage-swine-guide/preparing-for-farrowing/#:~:text=Post%2DFarrowing%20Pig%20Behavior,more%20available%20and%20better%20exposed. By: Wayne L. Singleton, Purdue University

Hoof Trimming

Approximately 15 percent of sows are culled due to lameness, according to the National Animal Health Management Services. Watch for pigs that have toenails longer than 2 inches (5.8 cm). If the hoof length is about 3 inches or 7 centimeters, then it is time to trim down the hoof. An easier way may be to notice how evenly a sow walks on all four legs and if she caters to one leg. Keep in mind that pigs carry 58 percent of their weight on their front hooves so they may not cater as much to a front hoof as they would to a back hoof.



Source: Watt Ag Net, 2015

Animal Identification

Animal identification is known as 'the combination of the identification and registration of an animal individually, with a unique identifier, or collectively by its epidemiological unit or group, with a unique group identifier (Richard, n.d).

This approach has been practiced for thousands of years, initially to signify ownership and later to prevent animal disease outbreaks and regulate trade during human disease epidemics (Bowling *et al.,* 2008).

However, there are other benefits of animal identification, such as accurate breeding histories of individual animals, significant contributions to breeding and genetic diversity management programs and in the implementation of targeted biosecurity measures (Richard, n.d). Below are several commonly known methods of animal identification.

1. Electronic Animal Identification Devices are electronic tags containing radio frequency identifiers (RFID) that emits a signal when stimulated by an appropriate electronic reader. The RFID consists of a microchip and a coiled copper antenna (Shanahan *et al.*, 2009). Although it is not necessary for farmers to possess readers, there can be labor cost savings in their use due to reduced time for reading and recording identification numbers; reader use may also improve accuracy.
2. Tattoo is an animal identification method that is mostly used on pigs, particularly white-skinned breeds, although green ink can be used for dark-skinned breeds. Tattoos have also been proposed as a means to identify poultry; the tattoo would be applied under the wing where there are fewer feathers.
3. Ear Notching & Ear Clipping. Ear notching is not an approved means of identification but may be used for on-farm management of pigs as an alternative to tattooing or ear tags: a special tool snips out a small piece of the ear flap to leave a permanent V-shaped notch. Notches could be used (but not as an official mark) to identify a herd number on one ear and an individual on the other, or a litter number on one ear and an individual on the other. There is a risk of infection in newly notched ears and the welfare concerns are greater than for some other identification methods. Ear Clipping has a similar procedure to ear notching but a more frequently used term when used for livestock other than pigs.
4. Ear Tags are by far the most common method of marking cattle, sheep and goats and are sometimes used for pigs. Ear tags may be electronic or non-electronic and there are numerous designs, but all entail the piercing of the ear flap. Most tags are now plastic (especially for electronic tags for which metal would interfere with the signal from the RFID), but some non electronic ear tags are metal. Apart from the initial puncturing of the ear flap (with possible introduction of infectious agents), the welfare concerns of ear tags are that some 'loop' types, if incorrectly inserted, may limit the growth of the ear and that all types may catch on fences etc. and be torn out of the ear.
5. Dewlap Tags are inserted into the dewlap over the brisket, where it is claimed there are few nerves in the skin. A supplied hole-punch is used to make a hole in the skin before passing the hasp of the tag through the dewlap; the tag is then passed over the hasp before the ends of the hasp are bent to retain the tag. Advantages claimed (by the suppliers) for dewlap tags over ear tags are that they are always visible (from in front of the animal) and the right way up, and that they do not snag on fences etc.
6. Pastern (Leg) Bands are a non-invasive method in which a band is fitted around the animal's lower leg; the pastern band may be electronic or non-electronic. The bands are primarily used for poultry. Care must be taken to not attach the band too tightly because it will cut off circulation as the bird grows.

7. Ruminal Bolus a bullet-shaped, high density container, usually ceramic, containing an electronic identifier; the bolus is designed to lodge in the rumen of the animal. Ruminal boluses were used as a means of identifying sheep during the National Scrapie Programme (NSP), but are not widely used for general identification as an ear tag is also needed as a visual identifier. If this secondary visual identifier is lost, an electronic reader must be used to identify the animal. In addition, boluses are sometimes regurgitated (although ear tags and pastern bands can also be lost).
8. Hot Branding is the application of a red hot 'branding iron' to the skin of the animal to cause a permanent mark through scarring of the skin. Despite welfare concerns 13,301 people signed an e-petition calling for the ending of multiple hot branding of equines in June 2012.
9. Freeze Branding is permitted for cattle as well as equines and is now more common than hot branding. The branding 'iron' (copper and brass are preferred metals) is cooled in liquid nitrogen, dry ice or similar coolant. When sufficiently cold the iron is applied to a shaved area of the animal's skin and held there for 15-45 seconds, the longer time on light colored animals.
10. Micro-chipping is the insertion of an electronic transponder directly under the skin of the animal, where it remains a permanent identifier that can be read with an appropriate electronic reader. Micro-chipping is widely used for companion animals such as dogs, but it is also common in equines. There is a risk that the micro-chip will migrate, making it more difficult to locate. For this reason microchipping is not commonly used for animals that may be slaughtered for human consumption: if the micro-chip cannot be quickly recovered it will interfere with abattoir throughput or, if not recovered at all, it may pose a risk if ingested by the consumer.
11. Alternative and Possible Future Technologies are such as Barcodes, Biometric Identifiers and Ultra High Frequency (UHF) Tags.

Regardless of these methods, there are overall challenges that arise with the methods, challenges based on Readability (caused by wearing, tearing, breakage and soiling), loosing of tags, welfare reasons such as inflammation and pain, tampering of tags from one animal to another which lessens the reliability of verification.

https://www.farm4tradesuite.com/blog/different-methods-of-animal-identification
https://www.extension.purdue.edu/extmedia/as/as-556-w.pdf

Poultry ID Methods

1. Wing bands are a permanent type of identification with a high retention rate that will stay with the chick for life and grow with it. Wing bands will not bother the bird and may be covered with feathers when they are older, making it more difficult to read. Wing bands are usually put on chicks, anywhere from a day old to a few weeks, but can also be put on adult birds.
2. Leg bands are aluminum or plastic band that wrap around a bird's leg and must be fitted to their leg size. Leg bands are more commonly used on fully grown birds, but when used on a young bird, the band must be constantly changed as the bird's leg grows. Leg bands can be a temporary source of identification or a permanent one. Plastic leg bands will fall off easier than metal ones due to the bird pecking at it or excess exposure to weather. Leg bands are the best option for those who do not wish to pierce the skin with a wing band or toe punch.
3. Toe punches can be used to mark the webbing between the toes of baby chicks. This option works for those who don't need colors or numbers to achieve their ID goals. Toe Punches create a small 2mm hole in the webbing, and there is a total of 16 different markings possible (one hole, two holes, left foot, right foot, etc.). Toe punches can also be used to pre-punch a hole in the wing webbing for wing bands.

4. Other options:
    a. Neck Tags – Plastic tags that can be hung by the neck of a baby chick.
    b. Wing Badges – Large plastic badge that attaches to the wing and has large visible numbers.
    c. Bird Bits – Plated steel or plastic bits that are placed in the bird's nostrils to help stop pecking. Special/deep feeders are needed so the birds may continue to eat.

Vaccinations

Vaccination Management Key Points

Vaccines only stimulate the immune system to produce specific antibodies. Therefore it is critical that the animal's immune system is functioning.
Individual herds/flocks may require additional vaccines and/or variations in the vaccination schedule.
A vaccination schedule on paper that is not or cannot be adhered to will not be effective if exposure occurs.

Many vaccines will not provide a high degree of protection if an overwhelming level of exposure occurs. Biosecurity should be a priority in your management decisions. When you test for a disease, you are (usually) testing for the presence of antibodies, so know what you've given because it will show. I.E. If you give a CL vaccine, then the CL test will be positive. A titer test is a laboratory test that measures the level of specific antibodies in a blood sample. Antibodies are proteins produced by the immune system to fight infections.

Vaccines work by imitating an infection—the presence of a disease-causing organism in the body—to engage the body's natural defenses. The active ingredient in all vaccines is an antigen, the name for any substance that causes the immune system to begin producing antibodies. In a vaccine, the antigen could be either

- Weakened or killed bacteria or viruses
- Bits of their exterior surface or genetic material, or
- Bacterial toxin treated to make it non-toxic

https://www.cdc.gov/vaccines/basics/explaining-how-vaccines-work.html

The immune system protects the body against "foreign invaders" such as bacteria and other microorganisms that can cause disease. Certain proteins and other molecules of these invaders are known as antigens, and the immune-system defenses of the body respond to antigens by producing antibodies.

Drugs can be used to affect the immune system in several ways. Specific immunotherapy is perhaps the most familiar type—it involves giving a specific antigen (such as a vaccine) to cause a specific, controlled immune system response. As a result, vaccines can provoke effective, and often very specific, longterm immunity. Nonspecific immunotherapy can cause the immune system to produce proteins and other compounds that strengthen immunity. It may also give the immune system an overall boost to help it resist

infection. Nonspecific immunity includes adjuvants, which may be added to a vaccine to increase its effectiveness, and immunostimulants, which may be given to treat longterm disease in which the immune system may be suppressed.

Types of Vaccines

Several types of vaccines have been developed for use in animals. Traditionally, vaccines were grouped according to whether they contained living or killed organisms. Killed organisms are not as likely to provoke a strong immune response (providing immunity) as living ones. Because of this, vaccines that use killed organisms frequently also include additional compounds, called adjuvants, intended to increase the overall effectiveness of the vaccine. A killed vaccine may contain the entire killed organism or just the portion of the organism that provokes the immune response. A Type 1 recombinant vaccine is also classified as killed.

Although vaccines that include live organisms tend to be more effective, there are some challenges involved in developing them, because the live organisms can also cause disease if not modified in some way. Attenuated vaccines are vaccines containing live organisms that have been altered so that they are less likely to cause disease. They can reproduce, which will cause the animal to mount a strong immune response. However, even if vaccines are attenuated, they can sometimes revert to virulence, causing the disease they were intended to prevent. To further ensure safety, Type 2 recombinant vaccines, or gene-deleted vaccines, were developed to safeguard against attenuated vaccines reverting to a form that can cause disease. The specific genes that cause disease in the host are found and deleted. The resulting vaccine includes live organisms that can reproduce and generate a strong immune response in the host, but can never cause disease.

Live vectored vaccines, or Type 3 recombinant vaccines, are an alternate method of inducing strong immunity with no risk of reversion to virulence. Using technology, the genes that code for a protective protein are removed from the disease-causing organisms and placed into a “vector” organism that does not cause disease. This vector reproduces in the host, producing high levels of the protective protein. The host develops a strong immune response to this protein, which then protects it from exposure to the original disease-causing organism. These vaccines are essentially free of adverse effects and are very stable.

DNA vaccines make it possible to immunize an animal by just injecting it with the DNA coding for a protein from the disease-causing organism. In addition to preventing diseases, DNA vaccine technology can also be used to treat diseases, including certain cancers. In most countries, the production of vaccines is strictly controlled and regulated by government authorities. All vaccines are checked for safety and potency.

Giving Vaccines

The simplest and most common method used to give a vaccine is with an injection in the muscle or under the skin. Intranasal vaccines are also available for specific diseases, but they can be difficult to give, especially to large animals. Vaccines can also be given in feed or drinking water, a method that is most often used in the poultry industry. Fish can be vaccinated by immersion in a solution of antigen, which is absorbed through their gills. Transdermal (absorbed through the skin) vaccines are also being developed.

Vaccination Schedules

Vaccines stimulate an immune response, which lasts a varying amount of time depending on the specific vaccine and disease-causing organism. This means that a specific method and schedule of subsequent vaccine administration is needed to maintain immunity. In young animals there are challenges to mounting an immune response that must be considered, including the age of the animal and overcoming the immunity passed to the newborn by the mother. In mature animals some vaccinations are usually given yearly, while vaccination every 2 to 3 years is sufficient to ensure immunity with others.

Adverse Consequences

Modern, commercially produced, government-approved vaccines are generally very safe. The most common risks with vaccines include injection-site reactions (such as pain or swelling, which usually subside within a short time), allergic responses, incomplete inactivation, disease in animals with compromised immune systems, neurologic complications, and, rarely, contamination with other live agents. The stress of vaccination may be enough to activate an infection already present in the animal. Hypersensitivity reactions—which range from mild to anaphylactic shock—can also occur. All animals should be observed for a period of time following vaccination. Discuss with your veterinarian what signs you should watch for. In rare cases, certain vaccines have been linked to development of a type of skin cancer in cats at the site where the vaccine was given.

Passive Immunity

In addition to vaccination, there are other ways of creating or increasing immunity against disease. Passive immunity involves one animal producing antibodies by active immunization, and then transferring those antibodies to a susceptible animal to confer immediate protection. The natural (and very important) form of passive immunization is the transfer of maternal antibodies to offspring across the placenta and in the colostrum (the first milk that is full of essential antibodies). Antisera may be produced in dogs against distemper and in cats against panleukopenia (also known as feline parvovirus enteritis). The effects of passive immunity are only temporary, however, as they only last for as long as the transferred antibody lasts, generally a few weeks.

In the same way, antibodies can be harvested from a portion of the blood to create immune globulin, which can then be given to another animal to provide immunity. For example, tetanus immune globulin (tetanus antitoxin) is given to animals and humans to confer immediate protection against tetanus.

https://www.merckvetmanual.com/special-pet-topics/drugs-and-vaccines/vaccines-and-immunotherapy

Pregnancy toxemia (Ketosis, Acetonemia)

Ketosis is a metabolic disease, which means that it is a disturbance in the normal body processes, not something "catching." It is most likely to occur just before kidding or within two to four weeks after. Mothers that are extremely overweight or underweight, carrying several babies, or lacking exercise are all susceptible to developing ketosis. A correctly balanced diet during pregnancy and in early lactation, exercise, and no stressful situations are all ways to avoid ketosis. Never diet a mother in late pregnancy. Good management can largely control metabolic diseases.

Risk Factors: inadequate nutrition, overconditioned OR underconditioned mothers, multiples

- Symptoms: loss of appetite, weak and may have muscle spasms, rapid breathing, frequent urination, coma, and death.
- Treatment: Glucose, yogurt thinned with water, Vitamin B injections, propylene glycol

When a pregnant mother takes ill, a likely cause is pregnancy toxemia. Pregnancy toxemia goes by several other names including pregnancy disease, twin lamb disease, lambing paralysis, and ketosis.

Pregnancy toxemia is a metabolic disorder caused by low glucose concentrations in the blood and excessive breakdown of body fat to compensate. "Ketones" are the toxic by-product produced during this rapid breakdown of fat, and it is possible to test for their presence in the mother's urine.
Inadequate nutrition during the last one-third of pregnancy is the primary cause of low blood sugar/pregnancy toxemia, as mothers cannot consume enough feed (energy) to meet the demands of their growing fetus(es). This is because approximately 70 percent of fetal growth occurs during the last 4 to 6 weeks of pregnancy.

Over-conditioned (condition score 4/5 or more) mothers are susceptible to pregnancy toxemia because of fat in their abdominal region –- there simply isn't enough room in the gut for the mother to eat enough –- and excessive fat resources for breakdown. Under-conditioned (condition score 2 or less) mothers are susceptible because they cannot eat enough to meet their own nutritional needs, let alone the added burden of developing fetuses.

Mothers carrying multiple births are also at high risk for pregnancy toxemia. Mothers carrying twins require 1.9 times the dry matter intake as mothers with singles. Moms with triplet fetuses require 230% more energy than mothers with singles. In fact, anything that affects the mother's ability to eat enough during late gestation can result in pregnancy toxemia: multiple fetuses, fat mothers, thin mothers, small mothers, timid mothers, granny mothers, dental disease, parasitism, and lack of exercise.

The symptoms of pregnancy toxemia are vague and can be similar to other diseases, especially hypocalcemia (or milk fever). Milk fever can be differentiated from pregnancy toxemia by the affected mother's response to calcium therapy.

Mothers in early stages of pregnancy toxemia will go off feed and appear lethargic. Their heads droop and they lag behind the rest of the flock and walk aimlessly. Teeth grinding and twitching is common.

Eventually, affected mothers become depressed, weak and have poor muscle control. In later stages, they lie down and are unable to rise. If left untreated, coma and death result.

Successful treatment of pregnancy toxemia requires early detection and steps to quickly meet the energy (glucose) needs of the affected mother. The most common treatment is to drench mothers with 2 to 3 ounces of propylene glycol 2 to 3 times daily. Yogurt mixed with water will also provide energy and bacteria to stimulate the rumen. Intravenous glucose is another possibility, but harder for producers to do on the farm.

Force feeding and/or injections of multiple B vitamins can help stimulate the mother's appetite. Antibiotics can be administered to prevent pneumonia. In advanced cases, a caesarian section may need to be performed to remove the fetuses and save the mother's life. If the lambs are near term, oftentimes, they too, can be saved. The nutrition of the entire flock should be suspect anytime a mother shows indications of pregnancy toxemia.

Of course, like other diseases, it makes more sense to prevent pregnancy toxemia than to treat it. To achieve this, it is absolutely essential that mothers be provided adequate energy in their ration during the last 4 to 6 weeks of gestation. Good quality hay should be provided. Grain and molasses are excellent sources of energy IF needed. Hay alone usually doesn't provide enough energy for mothers carrying triplets. Exercise is also deemed important in the prevention of pregnancy toxemia.

Abrupt feed changes must also be avoided, and mothers should not be stressed during late pregnancy. There must be adequate feeder space so that all mothers can fit around the feeders and get their fair share. Producers should strive to have mothers in moderate body flesh (condition score of 3+) prior to lambing. Mothers should be prevented from becoming obese during early pregnancy, and thin mothers should be separated and receive extra feed until they achieve the desired condition score.

Pregnancy toxemia in mothers occurs in late gestation as a consequence of poor-quality diets and inadequate maternal glucose homeostasis to meet the energy demand of the gravid uterus and fetoplacental unit. It predominantly occurs in mothers because the last trimester of gestation often coincides with the poorest availability of feed. Moms may become anorectic, depressed, and rapidly lose body condition; recumbency and death may result. Successful treatment requires early identification of the disease and improved dietary management. Affected mothers require aggressive treatment with fluids and other supportive measures.

https://www.merckvetmanual.com/metabolic-disorders/hepatic-lipidosis/pregnancy-toxemia-in-cows
https://www.sheepandgoat.com/pregtox

https://www.merckvetmanual.com/metabolic-disorders/hepatic-lipidosis/pregnancy-toxemia-in-sheep-and-goats#Etiology-and-Pathogenesis_v3282556

https://cals.cornell.edu/nys-4-h-animal-science-programs/livestock/goats/goat-fact-sheets/reproductive-problems-of-doe

Milk Fever

Milk fever is a metabolic disease. It is poorly named as the mother often has a lower (92-96°F) than normal temperature. Good management can also largely control milk fever. It generally occurs shortly after birth, and is the result of a calcium imbalance as lactation begins. First signs are listlessness and lack of appetite. Then the mother becomes uncoordinated and goes down. Death can happen quickly after this, so she needs help fast. The veterinarian will treat her with intravenous (into the veins) calcium solutions, to raise her blood calcium quickly.

Risk Factors: lack of calcium in diet, heavy milking mom, milking multiples

Symptoms: lethargy, listlessness, lack of appetite, lack of coordination, down and can't get up, low temperature

Treatment: CALCIUM, intravenous especially in late stages, oral if caught early

The best control for milk fever is to limit calcium in the feed during pregnancy, then to increase it once lactation begins. The mother needs lots of calcium as soon as she starts producing milk, but not before. High calcium feeds to avoid in late pregnancy are legume hays and soybean and linseed meals. These dietary rules do not apply to yearling mothers. Yearlings rarely if ever get milk fever. This is because their bodies have a high requirement for calcium throughout their pregnancy due to the fact that they are still growing themselves. To prevent milk fever, it is also best to wait until 24 hours after parturition to milk a heavy producing mother out completely. Instead, milk her just enough to release the pressure on her udder.

https://cals.cornell.edu/nys-4-h-animal-science-programs/livestock/goats/goat-fact-sheets/reproductive-problems-of-doe

Deworming Pregnant, Post Partum, and Lactating Sheep/Goats

Ewes experience reduced immunity during late pregnancy and lactation, increasing their susceptibility to parasites and affecting milk production and lamb health.

The periparturient egg rise (PPER) is a natural phenomenon whereby ewes/does suffer a temporary reduction in immunity to gastro-intestinal parasites around the time of lambing/kidding. The result is an increase in fecal egg counts which serves as the primary source of infection for grazing offspring. The reason for the periparturient egg rise is not completely understood, but it is believed to be the result of both hormonal and nutritional factors. It occurs from two weeks before parturition and up to 8 weeks after. Thirty days post-partum seems to be most common.

All sheep/goat producers should have a strategy for dealing with the periparturient egg rise. Traditionally, it was recommended that ewes/does be dewormed in the last month of pregnancy. For convenience, many producers dewormed ewes/does right after birthing.

Due to the widespread development of drug-resistant worms, it is now recommended that not all ewes/does be dewormed, but instead the principles of targeted selective treatment be applied. Targeted selective treatment is when you only deworm those that require treatment or would benefit from treatment. Leaving some females untreated preserves refugia (drug-susceptible worms).

Part of targeted selective treatment is performing a fecal float to determine what type of GI parasites eggs are found (qualitative test) and a fecal egg count (FEC) to determine the amount of eggs (quantitative test).

Deworming is still an effective strategy for the periparturient period, but using the principles of targeted selective treatment, only ewes/does meeting certain criteria would be dewormed prior to or at the time of parturition.

- Ewes/does with FAMACHA© scores of 4 or greater should be dewormed
- Ewes/does with body condition scores of 2 or less should be dewormed
- Ewes/does with 3 or more offspring should be dewormed
- Yearlings and first time moms/fresheners should be dewormed
- High producing dairy goats should be dewormed
- Females that don't meet one or more of these criteria should be left untreated

Levamisole (Prohibit®, Leva-Med®) should not be given to pregnant does, as there are claims of abortion. The albendazole (Valbazen®) label warns against its use in the first 45 days of pregnancy. When ewe/does are dewormed prior to parturition, they should be gently handled and not handled too close to their due dates.

Lambing/kidding at certain times of the year will lessen the magnitude of the periparturient egg rise. In most climates, this would be winter or fall. Ewes/does birthing in the spring are impacted most by the periparturient egg rise, since this is also when hypobiotic worms resume their life cycles. Hypobiotic refers to a state of arrested development or temporary dormancy in parasite larva (usually nematodes) within a host, allowing them to survive harsh environmental conditions and resume development when conditions improve. This is considered a worm survival mechanism.

Another way to reduce the impact of the periparturient egg rise is to increase the level of protein in the late gestation diet. Research has shown this to reduce fecal egg counts in pregnant ewes. Bypass protein seems to be especially beneficial. Bypass protein is protein that "escapes" the rumen and is digested further down the digestive tract. All feedstuffs have some bypass protein. You can check nutrient composition tables to see which feedstuffs have higher percentages of bypass protein.

Feeding forages with condensed tannins (e.g., Birdsfoot Trefoil, Big Trefoil, sericea lespedeza) have been shown to reduce the periparturient egg rise in ewes/does. Sericea lespedeza is a warm season legume that grows in lesser quality soils. Trefoils can be found on most semi-rural Midwest properties.

BioWorma® can be fed to ewe/does during the periparturient period to reduce the infection of pastures. It is a nutritional supplement that contains a worm-killing fungus (Duddingtonia flagrans). BioWorma® is a fine powder that needs to be added to some kind of feed, making it less useful for grass fed operations. It is certified organic approved in Australia, but not in the U.S. While having no effect in the animal, the fungus traps and kills roundworm larvae in the manure, greatly reducing infection of pastures with worm larvae. Clinically parasitized animals would still require deworming.

Keeping periparturient ewes/does in confinement (zero grazing) is another strategy for managing the periparturient egg rise. This is common with ewe/does that birth during the winter months, but can be done any time of the year. Parasites do not survive well in bedding or on slats. Sheep/goats don't generally get infected with worm parasites in confinement. The opposite is true for coccidia, and similar to worm parasites, ewe/does will have higher oocyst (egg) counts during the periparturient period. They are the source of infection for their offspring. This is why many producers feed a coccidiostat to ewes/does during late gestation. Feed a coccidiostat to pregnant females requires extra label drug use. To control coccidiosis, organic producers prioritize a clean environment: bedding, feeders, waterers; and a maintenance rate of 2 ounces of certified organic apple cider vinegar per gallon of water.

Genetic selection is a longer-term strategy for reducing the impact of the periparturient egg rise. Collecting fecal egg count data on periparturient females has been proposed as an alternative to collecting samples from growing animals. Adults (especially sheep) are better able to cope with the negative effects of parasitism. The heritability of periparturient fecal egg count (in ewes) is considered to be low to moderate. The magnitude of the periparturient egg rise is less in more resistant breeds.

Primary source
5/28/21, Sheep 101. Susan Schoenian

Additional resources
Periparturient egg rise -Best Management Practices (wormx.info)
Periparturient Egg Rise Video | PowerPoint slides
Parasitology Workshop, The Wifery, 2025

Dystocia in Lambing and Kidding

Dystocia is a general term used to describe an abnormal or difficult birth. Common dystocia cases include abnormally long birth time, head or shoulder lock, leg back (only one leg in birth canal), or breech deliveries (images of malpresentations can be found at the Alberta Lamb Producers website). Fluids surrounding lamb or kid during delivery should be clear or have a slight yellow tint. A dark yellow or brown coloration indicates a stressful delivery.

When does a ewe or doe need assistance? When progress stops! More than 30 minutes without progress means the ewe or doe likely needs assistance. Progress means the lamb or kid is getting closer to being delivered (in other words, more of the lamb or kid is visible with each contraction).

Why does progress stop?

- Ewe or doe gave up or ran out of energy.
- Lamb or kid's head or shoulder is locked by dam's pelvis.
- One or more legs back (leg tucked under lamb or kid's body and not in birth canal).
- Lamb or kid's head is back behind dam's pelvis and not in birth canal.
- Breech or backward delivery. (Note: True breech is when lamb or kid is being born rear first with both back legs tucked under its belly. This can be identified only by palpation.)
- Twins or triplets are tangled (two legs that don't belong to the same lamb or kid have emerged).
- Dam's cervix is not dilated.

What do you do when progress stops?

- Restrain ewe or doe in a place where she is not running around or stressed.
- Place halter on ewe or doe.
- Move her to a smaller pen.
- Have one person hold the ewe or doe's head while another assists with the following steps.
- Palpate to determine cause of problem.
- Wear OB glove.
- Be gentle and slow in your movements.
- Avoid unnecessary stress and damage to cervix or uterus.
- If two front feet and a head are located in the birth canal, gently pull the lamb or kid out by holding both front legs. Pull out and down firmly and steadily; be patient.
- If two front feet and a head are not in the birth canal, palpate past your wrist and locate leg or head. Work slowly and carefully to pull both front legs and head into the birth canal. Once the head and both forelimbs are in the correct position, deliver lamb or kid by holding both legs and pulling out and down firmly and steadily.

Once successful delivery occurs, make sure the lamb or kid is breathing, step out of the pen, and let the dam take over.

Identification and correction of a breech (backward delivery)

- The first two joints on a front leg bend in the *same* direction.
- The first two joints on a back leg bend in the *opposite* direction.
- Palpate limb and manipulate joints. Is it a front leg or a back leg?
- If a breech happens, work to position both back legs in birth canal:
- When both back legs are in position, deliver lamb or kid as quickly as possible.

- When the lamb or kid is born breeched, its umbilical cord will break and the animal will take its first breath while its head is still inside. To avoid fluid aspiration, deliver lamb or kid quickly.

When to call the vet (or your community)

- The delivery process is no longer progressing and you are not comfortable assisting any further.
- Cervix is not dilated.
- You are unable to get the lamb or kid in the birth canal correctly or are unfamiliar with presentation.

Retained Placenta

Retained placenta can occur after parturition. The afterbirth is not delivered, but remains in the uterus, or partially inside. Do not pull at the exposed parts. Simply clip them off or tie them in a knot and wait. The mother should be started on antibiotics to combat any infections from the afterbirth rotting inside her. You can also get hormone injections from your vet to help her push.

- Risk Factors: hard labor, fatigued mother
- Symptoms: afterbirth not completely delivered
- Treatment: wait for placenta to be delivered, antibiotics, induce more contractions in order to deliver placenta

https://cals.cornell.edu/nys-4-h-animal-science-programs/livestock/goats/goat-fact-sheets/reproductive-problems-of-doe

Intro to Nursing

One of the first tasks of newborn livestock is to stand up and nurse from mom. Sometimes, they need some help getting started.

Timing

- Lambs: standing within 30 minutes, be concerned after 60 minutes; nursing within 60 minutes, be concerned after 90 minutes
- Kids: standing within 30 minutes, be concerned after 60 minutes; nursing within 60 minutes, be concerned after 90 minutes
- Calves: standing within 60 minutes, be concerned after 90 minutes; nursing within 2 hours, be concerned after 3 hours
- Piglets: standing within 5-15 minutes, be concerned after 30 minutes; nursing within 45 minutes, be concerned if much longer than that
- Foals: standing within 60 minutes, be concerned after 90 minutes; nursing within 2 hours, concerned after 3 hours

Colostrum

Mother's first milk, critical for newborn health. Provides fat and protein as well as antibodies that can only be absorbed by the newborn's small intestine for the first 24 hours.

Colostrum Replacements

- Milk out the mother if possible
- Another mother in the herd/flock
- Species-Specific freeze dried
- Bovine colostrum for other species

Frozen colostrum will last for 12 months if kept frozen. Consider harvesting some each year for the next. Microwaving colostrum to thaw is not advised due to microwaving's uneven heating and creating hot spots in the milk that will reach over 140°F which kills the antibodies. Pasteurizing over 140°F will also kill the antibodies.

Milk Replacers

Why you might need them

- Mother doesn't have enough
- Mastitis
- Lost mother
- Species Specific

Where to find them

- Another mother in the herd/flock
- Milk or graft
- Commercial replacers
- Feed mill
- Online
- Make your own
- Be very careful, each species' requirements are very specific, you may sacrifice growth and health

Milking Sheep and Goats

Use an appropriate pre and post dip to prevent pathogens from entering the teat canal. Wearing gloves helps protect mother from your bacteria, dirty fingernails, staph, etc.

Secure your sheep: halter, headlock, etc. Feeding grain while milking ensures you know if she's eating all her grain and may keep her calm.

Clean her udder in preparation for milking. If it is very dirty, wash it with an udder wash, and then dry it. If her udder is already clean, pre-dip the teats.

It is best to use a liquid dip in a cup rather than a squirt bottle, as you may miss parts of the teat when spraying it. Once you have dipped the teats, use a clean paper towel to wipe off the pre-dip. Your goal is to make sure that the udder is clean and disinfected, as well as your hands are clean and disinfected.

Some people like to milk from behind, some from the side. Based on the shape of the sheep udders, our preference is to do this step from the side so that we are not inadvertently bending the teat. You can use whichever hand you are more comfortable with. We find that using the hand closest to the hind leg when you stand facing the rear of the sheep works best.

Massaging the udder helps with milk let down. To get milk to come out, you need to make a circle of your thumb and pointer finger around the top of the teat. Push up into the udder a little bit and pinch your fingers together. Done correctly, you will see the teat bulge showing that it is full of milk. Keep your thumb and pointer finger pinched, and squeeze your other fingers closed one by one to push the milk down and out the end of the teat. If you don't keep the top pinched off enough, the milk will rush past your thumb and back into the udder rather than coming out the teat opening. Done right you will get a big solid stream of milk. If you don't try again. You may need to do some more bumping and massaging to get things started. Repeat this process until the udder is empty.
https://snowdropfarm.com/2024/02/23/milking-sheep-101-setting-yourself-up-for-success/

Milking Mares

The average lactating mare produces between 500 milliliters to 1 liter of milk every two hours. Mares can be milked by commercial milker, syringe, or hand milking.

Commercial Milkers

Commercial milkers are easy to use, which is an asset when you or your staff are inexperienced at milking mares. Study results show commercial milkers have higher and faster milk yields than other methods. The downside to commercial milkers is their cost and durability, he added. The O-rings tend to wear out and cause a decrease in suction. Commercial milkers can also be fragile, he said, and do not stand up to getting kicked or stepped on.

Syringe

Often, you don't have a commercial milker on hand when you need one, in which case you can try making your own milking device. Start with a 60cc syringe. Cut off the needle and apply water-based lubricant. Remove the plunger, replace it from the other direction, and place the flange so it seals up against the udder. The syringe method requires diligence and patience, he said. It's easy to spill and shouldn't be rushed.

Hand Milking

- Milking by hand can mean dealing with a mare who might not be used to this. Mares might also have udder edema (fluid swelling), which can be sore and painful. For the handler, anatomical variations such as small teats can prove challenging, as well.
- To protect the mare's milk supply when milking by hand, be sure you're emptying the udder and not simply milking until your hand gets tired. Make sure milk is coming out of both openings in the teat—not just one. Skipping milkings because of the mare's behavior can also lead to a decrease in milk production.

Milk every two hours, and empty the udder completely. Keep hands clean, or wear gloves, so you don't introduce bacteria and cause mastitis. Feeding the mare can encourage let-down; the mare needs adequate food and water to produce milk, anyway. Allowing her to nuzzle the foal might help.
https://thehorse.com/1121409/milking-mares-and-maintaining-milk-production/

Milking Cows
Rub the udder down with a warm soapy cloth. Be hard with this step, they're not humans and this helps stimulate the udder for milking.
Take another cloth and dry off the udder.
Take your position. If you're right-handed, it's easiest to milk from the right-hand side.
To get the milk to come down, using your thumb and forefinger, grasp the teat and squeeze while pulling down. This will force the milk out.
Continue milking until the udder is empty.
https://abundantpermaculture.com/how-to-milk-a-cow-by-hand/

More Information:
https://www.canr.msu.edu/news/unwavering-loyalty-piglet-devotion-to-the-chosen-sow-teat#:~:text=Piglets%20exhibit%20one%20of%20the,2%2D3%20days%20of%20age.

Newborn kid/ lamb that seems lifeless or stillborn

When a kid/lamb just born appears lifeless, try these steps:

- Clear face of fetal membranes.
- Use blue suction bulb to clear fluid from nostrils.
- Open mouth gently to make sure no fluid is present and the tongue isn't blocking the airway. Kid should move its tongue in response to you doing this and might even possibly attempt to suckle.
- Touch eye lid (on upper eyelid on/near eyelashes) to see if the kid blinks; it should although it may be a slow response.
- Feel for a heartbeat by cupping hand around bottom of chest just behind elbows if you don't have a stethoscope, practice on live kids so that you know what you are feeling for. Use your stethoscope if you have one.
- If no eye blink, no tongue movement, and no heartbeat, kid is likely a stillborn and very unlikely to be revived. However, you can try to see if you can stimulate something by getting a towel and rubbing the kid vigorously on each side of its chest.
- If there is an eye blink, a weak but present heartbeat, and tongue movement, then use the towel to stimulate the kid and dry it off. Some take more effort than others to get going. Birth is stressful, especially if labor was prolonged, and some take longer to acclimate to life outside the uterus than others.
- Keep in mind these weak kids need to be monitored as it may take longer than 2 hours for them to stand and nurse, so they may need to be assisted. Make sure they are nursing.

How to "dry warm" a newborn or young kid/lamb

Supplies

- Rubbermaid Bin or something similar that the animal will fit in comfortably. DO NOT use metal as this can overheat and cause burns. Plastic is best
- 2 blankets or large towels-1 to wrap the baby in and one to drape the over the top of the bin
- Hairdryer
- Thermometer
- Lube or Vaseline for rectal temperature taking
- Honey and cayenne powder (¼ cup honey mixed with 2 teaspoons of cayenne powder)
- A clip or something similar to attach hair dryer to top of bin
- Paper/pen/cell phone to record temperature assessments
- Latex gloves, if available

Dry baby

Check body temperature rectally so you have a baseline to start with. You will be taking their temp every 20 minutes. Using a new, dry towel/blanket, wrap baby and place in bin. Attach hair dryer to side of bin and lay towel over the top. Turn the dryer on low only. This will take time, usually hours, to slowly get them back to normal body temperature. Use the honey/cayenne powder mixture every 15 to 30 minutes by rubbing a small fingerful on their gums inside their cheek. *Keep away from eyes and rectum when taking temperature.* Use gloves or wash your hands thoroughly in between the different parts of procedure. It's helpful to take the rectal temperature and then rub gums with honey/cayenne mixture every 20 mins to minimize the amount of time one is lifting off the towel and losing the accumulated heat. DO NOT LET ANIMAL OVERHEAT. Consult your vitals sheet for accurate rectal temp of the species you are warming. This is an exhausting process for the baby and they will be fatigued after. However, they should definitely brighten and become more lively (and possibly vocal) throughout the warming process.

The Importance of Colostrum

In some cases, kids don't get adequate colostrum – This can be a serious health hazard for the kid. Colostrum contains antibodies (proteins that fight disease.) Newborn kid's immune system is considered naïve, and hasn't produced antibodies yet. Mom's first milk (colostrum) contains these antibodies, especially if she has received a booster vaccination 30 days prior to her due date. It takes time for kid's immune system to start producing the antibodies, so their body uses the antibodies from colostrum during the first few weeks of life. As kid's immune system starts to function and produce antibodies, the supply from colostrum is being depleted. Depletion of colostral antibodies typically occurs at around 6-8 weeks of age, at around the time we start vaccinating the kids (CD/T toxoid).

Colostrum is much thicker and stickier than normal milk, that is because of the antibodies that are present. The kid's GI tract is designed to be able to absorb that sticky, thick substance with its large protein particles (antibodies) during the first 24-48 hours of life. The majority of colostrum is absorbed across the gut wall in the first several hours of life (within 12 hours typically is maximum absorption, and it tapers off over the next day or so). Once the kid starts consuming the colostrum (or ANY thing at all), the GI tract begins to change what it can absorb. The ability of the lining of the GI tract to absorb large protein particles decreases with time and amount ingested. So, if anything other than colostrum is given during the first day of life, then the amount of colostrum that is able to be absorbed can be decreased considerably. If you have an orphaned kid, or one where amount of colostrum that can be given to the kid is very limited because of circumstances, you want ALL of it to be utilized, not wasted because it can't be absorbed by a gut that was closed too early by other things given.

What If I have no Colostrum Available ?

Other sources for colostrum (in order of acceptability):

- Other dams on the property that currently have colostrum.
- Frozen colostrum from does on your property.
- Fresh or frozen colostrum from goat breeders in your area (tested negative for CAE, CL, and Johnes (& Brucellosis or TB if in the area).

- Fresh or frozen colostrum from cattle farms in your area (tested negative for Johnes (Brucellosis or TB, if indicated.))
- Powdered Goat Colostrum Replacer-make sure the product used contains immunoglobulins, the more the better.
- Powdered Goat Colostrum Supplement is not acceptable and does not contain any antibodies at all in most cases. If you aren't sure that mom has enough colostrum available, especially if she has multiple kids, and/or she was leaking milk prior to giving birth, it may be necessary to supplement the kids with colostrum from another source.

Vaccination considerations

If mom was vaccinated 30 days prior to delivery of the kids, and the kids have received adequate colostrum, then it is recommended that they receive their first CD/T vaccination at 8 weeks of age. If mom did not have a 30 day prior to delivery CD/T booster but she had been vaccinated previously, and kid does receive adequate colostrum, consider kid vaccination at 4-6 weeks of age. If mom did not have a 30 day prior to delivery CD/T booster and she had not ever been vaccinated previously, and kid does receive adequate colostrum, consider kid vaccination at 2-4 weeks of age. If mom did not have a 30 day prior to delivery CD/T booster and kid did not receive adequate colostrum, consider kid vaccination at 1-2 weeks of age, possibly within a few days of birth if mom never received vaccines.

Understanding Colostrum

The main component of colostrum also crosses the placental barrier and is delivered to the fetus in utero during the latter stages of pregnancy. That is why human newborns can go straight to milk replacer without breastfeeding or trying to get a colostrum replacer in them. In livestock, the colostral components are built up and stored in the milk glands during the last 3-5 weeks of pregnancy, and it doesn't cross the placenta. This builds up the volume and concentration needed to provide adequate transfer of colostrum (IgG) to the offspring to provide immunity. An absolute minimum of 50g is required, with 100g of IgG recommended as being adequate to provide immunity until the offspring's own immune system can mature. Transfer of colostrum is very limited in time (12-24 hours because of gut closure in the newborn not allowing larger proteins through any more), and giving birth and suckling both drastically decrease its production in livestock, with those two actions stimulating change to milk production. So if pregnant while lactating, any colostrum that might be produced is drastically diluted out by volume of milk produced for current lactation, as to be non-existent and insufficient for providing immunity to the newborns, resulting in failure of passive transfer. Also, in goats, kids born from a doe still in milk with no dry off period will have lower birth weights than does allowed at least a 56 day dry off period.

 Posted by RVO January 4, 2026, Posted in Goat Vet Corner Files, By Dr. Chastine

Colostrum

Mother's first milk, critical for newborn health. Provides fat and protein as well as antibodies that can only be absorbed by the newborn's small intestine for the first 24 hours.

Sheep and Goats Colostrum

All mammals produce colostrum. It is the thick, yellowish "first milk" that is produced by the female after she gives birth (parturition). Colostrum is rich in energy, protein, vitamins and minerals. Most importantly, it contains maternal antibodies that help protect the newborn from disease pathogens during the early part of its life. Ewes and does only produce colostrum for about 24 hours (plus or minus a few hours) after delivering their offspring.

The type of antibodies the colostrum contains depends upon the antigens to which the dam was exposed to (by disease exposure or vaccination). Ewes and does should be vaccinated in late pregnancy for overeating disease (*clostridium perfringins* type C & D) and tetanus (*clostridium tetani*) so that they will pass antibodies for these diseases to their offspring via the colostrum.

Pregnant females should be kept in the location where they are going to lamb or kid for at least 14 days prior to parturition. This gives them time to manufacture the correct antibodies for their specific lambing and kidding environment.

All newborn mammals need colostrum. While it is possible for a lamb or kid to survive without colostrum in a relatively disease-free environment, the likelihood of disease and death is much higher in lambs and kids that do not receive adequate colostrum. Orphan lambs and kids are often more susceptible to diarrhea and pneumonia because they did not consume enough high quality colostrum.

Newborn lambs and kids have limited energy reserves and need rapid access to colostrum to maintain body temperature and survive, especially those born when it is cold. Lambs are born with low vitamin A reserves. Colostrum is usually rich in vitamin A and helps to build stores in the newborn.

Colostrum is also the first source of Vitamin E for the lamb or kid. The iron content of colostrum is 10 to 17 times higher in colostrum than normal milk. Colostrum also has laxative qualities and helps to eliminate fecal matter in the newborn's digestive tract.

Research has shown that livestock vary in the quantity and quality of colostrum that they produce. Younger females tend to produce less colostrum than mature females. Inadequate nutriton during late pregnancy can reduce the quantity and quality of colostrum.

In most underfed ewes, the lambs' needs for colostrum often exceed the ewe's production whereas females which are well-fed in late pregnancy usually produce more than their babies need. At the same time, Oregon researchers found no differences in the amount and quality of colostrum produced by ewes with body condition scores ranging from 2.5 to 3.5 [5].

Lambs and kids should nurse as soon after birth as possible in order to receive adequate colostrum. After parturition, it is a good idea to strip each teat to remove the wax plug and make sure the ewe or doe has enough colostrum to feed her offspring. Antibodies are large protein molecules that can only cross the

intestinal wall and enter the bloodstream of the lamb during the first 24 to 36 hours of life. Absorption is most efficient the first few hours after birth.

High quality colostrum contains 50 mg or more of immunoglobulin-G (IgG). The concentration of immunoglobulins in colostrum decreases rapidly after parturition. An Oregon study showed that IgG concentration in ewe's milk diminished to zero by 23 hours post-partum. Therefore, the sooner cololostrum is consumed, the better. Thirty minutes is considered optimum whereas 18 hours is considered a must.

Lambs and kids that are too weak to nurse can be fed colostrum with a nippled bottle or stomach tube. It is recommended that lambs receive 10 percent of their weight in colostrum by the time they are 24 hours old. This means that a 10 pound lamb should receive one pound (16 ounces) of colostrum within 24 hours of birth [3]. Colostrum should be fed at blood temperature (102-103°F, 39-40°C), 2 to 4 ounces at 3 to 4 hour intervals. A 60 cc syringe holds 2 ounces of colostrum.

Colostrum sources
The best source of colostrum is from the lamb or kid's own dam or another female that has recently given birth. If this is not possible, fresh or frozen colostrum from other females in the flock can be used. Colostrum from females from the same flock is the best source of colostrum because it will have custom-made antibodies. When using colostrum from another flock or herd, try to choose a farm with a similar disease status.

It is always a good idea to milk out ewes and does that have extra milk (colostrum) and to freeze it for later use. Females which give birth to singles often have enough colostrum for a second offspring. You can milk ewes and does out by hand or use a colostrum collection device, e.g. Udderly EZ™.

Cow colostrum can serve as a substitute for lamb and goat colostrum, but because cow's milk is not as nutritious as ewe's milk, more volume (about one third) must be fed to lambs. Milk from the colored breeds is better because it is higher in fat. Though Johne's disease is not as common in sheep and goats as it is in cattle, it is advisable to get cow colostrum from a herd that has tested negative for Johne's.

Frozen colostrum should be thawed slowly in a warm water bath. Do not use direct heat or this will destroy the antibodies. A microwave can be used to thaw colostrum if it is heated for short periods of time on low power. It is best to freeze colostrum in small quantities because once frozen colostrum is thawed, it cannot be re-frozen. Ice cube trays work well to freeze small quantities of colostrum. Once the trays are frozen, the colostrum cubes can be stored in zip lock bags.

Frozen colostrum can be stored for up to 12 months [4]. A study conducted in 2001 by the University of Tennessee showed that the freezing and thawing of colostrum did not destroy the components in the milk which provide resistance to E. coli challenge in newborn lambs [6]. Colostrum can be refrigerated for one week before quality (IgG concentration) declines.

It's important not to confuse colostrum "supplements" with colostrum replacements or substitutes. Be

sure to read the labels carefully. A colostrum product that is unable to raise the blood concentration of IgG above the species standard is called a colostrum supplement.

Colostrum supplements are nutritious and can be used to increase the amount of IgG fed when no other source of colostrum is available, but they cannot replace high quality colostrum. They do not contain sufficient quantities of antibodies. They are often marketed as colostrum replacements, which they are not. A Spanish study concluded that kids receiving a commercial colostrum did not acquire the necessary immunity as compared to kids consuming fresh sheep and frozen goat colostrum [10].

Colostrum products that contain IgG are regulated by the USDA Center for Veterinary Biologics. Any product that able to raise serum IgG concentration above 10 mg/ml may be called a colostrum replacer. These products are bovine serum-based products that contain at least 100 g of IgG per liter, plus fat, protein, vitamins and minerals needed by the newborn calf. In trials, calves fed colostrum replacers have performed as well as calves fed maternal colostrum. Land O'Lakes recently developed a colostrum replacement for lambs and kids [9].

Lamb or kid milk replacer is never a substitute for colostrum. It should not be fed until the lamb or kid has received adequate colostrum, usually over 24 hours of age.

Diseases transmitted in the colostrum
Some diseases are transferred from the dam to the offspring via the colostrum and milk. Both Ovine Progressive Pneumonia (OPP) and Caprine Arthritic Encephalitis (CAE) are transmitted in this manner. These diseases are very similar and can be transferred between species. A lamb that consumes colostrum from a CAE-positive doe can test positive for OPP and a kid that consume colostrum from a OPP-positive ewe can test positive for CAE.

To prevent the transmission of either disease from positive dams to offspring, the offspring should not be allowed to nurse positive dams. They should be fed pasteurized colostrum or cow colostrum. The bacteria that causes Johne's disease can also be transmitted through colostrum, though it is not the primary mode of transmission.
https://www.sheepandgoat.com/colostrum

Bovine

The number of calves in North America that fail to receive adequate colostrum ranges from 11%-31%. This article will review key points on colostrum management to ensure calves are set up for success from the beginning of life.

Why do calves need colostrum?

The placenta is unique in the bovine because it stops maternal and fetal blood supplies from mixing. This separation prevents immunoglobulins from being transferred to the fetus prior to birth. Immunoglobulins are a class of proteins that act as antibodies to protect the immune system from disease. Without the transfer of protective antibodies from the dam to the calf, the calf is at risk for preweaning morbidity and

mortality. Failure of passive transfer has also been shown to have a negative effect on weaning weights and average daily gain in the feed yard.

What exactly is colostrum?

Colostrum is the first milk produced by the dam. It contains immunoglobulins, specifically IgG which is derived from the dam's blood serum. This process begins several weeks before calving and peaks around 1-3 days before birth. In addition to IgG, colostrum also contains white blood cells, such as neutrophils and leukocytes, that help further protect the calf from pathogens while also providing the necessary energy and protein required for neonatal nutrition and vigor. Colostral vitamins A and E play a vital role in immune stimulation and antioxidant properties.

How much colostrum does a newborn calf need?

Previous studies have shown that calves require at least 150 g of IgG for immune protection, with recent research suggesting 200-300g as ideal. Several factors can influence the quality of colostrum, including dam nutrition, body condition score, and age of the dam. Older cows usually have higher quality and quantity of colostrum than heifers. Researchers have shown calves born to heifers with a body condition score of 5-6 stood faster and had higher levels of IgG than calves born to BCS 3-4 heifers. As reference, a healthy beef cow with at least BCS 5 should produce approximately 95 g of IgG per liter of colostrum.

Timing is everything.

The cells lining the small intestine are primed to readily absorb IgG at birth, but the timing window decreases significantly after 12 hours of life. Peak absorption happens in the first four hours post-calving and complete gut closure is observed at 24 hours of life. Temperature can affect gut absorption as well as metabolic acidosis, which occurs in calves that experienced difficult births. If you assisted in the birth of the calf, it is a good idea to ensure colostrum intake by milking the cow and offering it to the calf. Studies have shown minimal difference in IgG absorption when comparing nipple feeding versus esophageal tube feeding, therefore either method is correct. Tubing is usually required in calves born under distress because they lack the vigor to nurse.

Not all is created equal.

The best source of colostrum for a newborn calf is the mother. If that is not an option, the next option would be a donor cow from the same herd. Usually the older the cow, the better antibodies she can provide. Healthy cows with a solid vaccine history are ideal. Colostrum can be stored in quart bags in the freezer for up to one year. It is important to remember that heat from the microwave can denature the IgG antibodies. A water bath with temperatures below 140° F is the best environment to thaw colostrum.

There are several choices for freeze dried colostrum options. Always remember to read the labels! Colostrum supplements are intended to only supplement a calf that already received some colostrum. Most of the time these contain low levels of IgG and will not provide adequate protection alone. A true colostrum replacement needs to contain at least 150 g of bovine IgG as well as protein and fat for nutritional requirements. Double check to see how to mix the product to ensure proper absorption.

Being prepared is key. Maintaining a good relationship with your veterinarian throughout the year will provide added value to your operation during calving season.
https://beef.unl.edu/beefwatch/2022/colostrum-101/

Colostrum in Swine

Colostrum is the first milk a sow produces shortly after, even during, the farrowing process. Its production is triggered by a cascade of hormones before farrowing begins. During this initial colostral phase, the sow continuously allows her piglets to access her udder, enabling them to move from teat to teat and consume colostrum.

Colostrum is vital for the survival and growth of piglets in their earliest stages of life, as it provides essential nutrients, energy, and antibodies. Its significance is particularly important in modern swine production, where optimizing piglet health directly influences productivity and profitability. The "three Qs" of colostrum management, as highlighted by the Hypor technical team, emphasize the key factors:

Quality – The percentage or yield of fat and immunoglobins
Quantity – Sufficient intake for each piglet
Quickness – Piglets need access to this rich resource as quickly as possible.
Effective management of colostrum is crucial for the health and performance of piglets, contributing significantly to the overall success of farm operations.

Piglets are born without a fully developed immune system. Unlike humans, pigs do not transfer antibodies from the mother to the fetus through the placenta. This means piglets rely entirely on colostrum for passive immunity.

Recent research involved collecting colostrum from sows during the first 24 hours after farrowing and analyzing its contents. The amounts were averaged over the period of collection. Milk was also collected and analyzed later in the lactation period.

Colostrum contains a compound called Immunoglobulin G (IgG), which is essential for providing piglets with passive immunity while they are nursing. Colostrum is significantly richer in proteins, fats, and carbohydrates compared to regular milk. These nutrients are crucial for piglets, as they are born with very low energy reserves and minimal body fat.

Colostrum is secreted in the greatest amounts within the first 12 hours post-farrowing, and its production significantly decreases between 12 to 24 hours and it typically depletes around 40 hours after the first piglet is born. Moreover, the limited window for the production of these immune components coincides with the piglets' ability to absorb and utilize them.

In large farm animals like pigs, the intestine can close the wider channels necessary to absorb large IgG molecules as soon as 24 hours after birth, effectively halting their ability to take in these important immunological factors. Additionally, piglets should not be cross-fostered before validating colostrum

intake, as they cannot absorb and utilize other immunological components, such as lymphocytes, from foster sows. This highlights the importance of timely and sufficient colostrum consumption from their mother within the first few hours of life.

Colostrum composition compared to milk

Item	Colostrum	Milk
Fat, %	6.21	6.53
Lactose, %	3.78	5.37
Protein, %	10.7	4.98
Dry Matter, %	22.6	17.5
IgG, mg/mL	40.7	NA

Colostrum imunoglobin concentration

Colostrum not only provides essential components for the development of a piglet's passive immunity, but it also serves as a potent energy source. Colostrum is packed with high-quality proteins and energy sources essential for piglet survival by supporting their metabolic needs during the critical first hours of life.

Newborn piglets have limited energy reserves and low body fat, making the nutrient-dense composition of colostrum critical for meeting their metabolic needs for thermoregulation and overall survival. Lightweight piglets, which we consider to be less than 1.0 kg, are more likely to present signs of hypoxia at birth, and have reduced colostrum intake in the first 24 hours. This is mainly attributed to their size or weakness at birth, as they are more likely to miss more nursing events or are in greater competition for an available and functional teat.

Additionally, hypothermic piglets and those with low viability—indicated by a rectal temperature below 100.4F or 38°C—are less likely to consume sufficient colostrum, further increasing their vulnerability. Thermal imaging studies have shown that piglets who receive colostrum achieve higher body temperatures, which enhances their viability.

Colostrum also has growth factors that aid in the development of the digestive tract. These growth factors and bioactive peptides in colostrum promote intestinal growth, which enhances nutrient absorption efficiency. This early development lays the foundation for improved feed conversion and growth rates during the nursery and finishing phases. Production efficiency can be influenced within the first 24 hours of life, making it essential for piglets to individually consume enough colostrum.

The ideal amount of colostrum needed per piglet is 250 grams, or 1 Cup. This intake should be achieved over several nursing sessions. This colostrum intake should occur within the first 12 hours after birth, or as soon as reasonably possible, because of the "closure" of the intestinal wall which was previously mentioned.

Colostrum and the Impact on the Pig

Colostrum intake has a significant impact on piglet health and performance. Timely and adequate intake of colostrum significantly reduces pre-weaning mortality. Piglets that do not receive enough colostrum are more susceptible to infections, starvation, and weakness, which can lead to higher losses for producers. Colostrum intake is heavily determined by the piglet's ability to reach the teat.

Research has shown that piglets ingesting less than 200 grams of colostrum at birth have a pre-weaning mortality rate of 43.4%, while those that consume more than this amount have a mortality rate of only 7.1%. Moreover, piglets that die during lactation typically exhibit lower weight gain, weight loss, lower rectal temperatures, increased cortisol levels, and decreased plasma IgG and glucose levels.

Another study found that for every 100 grams increase in piglet birth weight, their individual colostrum intake increased by 28 grams. Lighter birthweight piglets require additional management in split-suckling, possible teat training, or cross-fostering to give them an advantage with piglets relative to their own size. While some events during farrowing are beyond the farmer's control, many issues can be mitigated through proper colostrum consumption and exceptional care of piglets on their first day.

Adequate consumption of colostrum has been shown to significantly enhance the potential for offspring to become full-value finishers, as the benefits of colostrum extend well beyond the farrowing period. Colostrum contains various growth factors, such as Insulin-like Growth Factor 1 (IGF-1) and Epidermal Growth Factor (EGF), which are crucial for the development and maturation of the piglets' gastrointestinal tract and other organs. These bioactive components support the overall growth and development of piglets, setting a strong foundation for their future health and productivity.

Both colostrum intake and the birth weight of piglets significantly affect their weights at weaning, during the growing phase, and at finishing. One study found piglets who consumed less than 290 grams of colostrum weighed approximately two kilograms less at 42 days, compared to piglets of the same age who consumed more than 290 grams. Additionally, higher colostrum intake was shown to benefit piglets with lower birth weights more significantly than their littermates, leading to reduced pre-weaning and nursery mortality.

Colostrum can also impact the female reproductive system influencing the later development of the reproductive tract. For instance, the hormone relaxin found in colostrum is crucial for the development of the uterus in pre-pubertal gilts, pregnant sows, and their daughters within a few weeks after birth.

Research indicates that piglets raised on milk replacers without supplemental colostrum exhibit lower gene expression related to the growth of the endometrium, or the membrane that lines the uterus, and delayed gland development within the tissue. Additionally, another study found that low colostrum intake is associated with a later onset of puberty and a reduced number of piglets born to the sow.

Effective Strategies for Colostrum Management

Validating adequate colostrum intake for all piglets is essential, yet it can be challenging. To address these challenges and improve piglet survival rates, effective colostrum management practices are necessary. One key practice is ensuring that piglets have early and frequent access to the sow. This can be achieved by encouraging frequent nursing, keeping the piglets close to the udder, and minimizing disturbances.

It's important to realize that not all piglets in a litter have equal access to the sow's teats. Smaller, weaker, or last-born piglets may require assistance to access colostrum. Split suckling can help in these cases, especially when there are more piglets than functional teats. This should be performed as soon as possible after farrowing, ideally within the first 12 hours. We recommend organizing the piglets into two groups:

1. Small and last-born piglets
2. Larger and first-born piglets

Conduct five rotations of 30 to 45 minutes each, starting with group 1 (small and last-born piglets) at the udder. It is critical to keep the piglets that are not nursing separated, dry, and warm. Additionally, it's important to consider that early cross-fostering (within 12 hours post-farrowing) may disrupt a piglet's colostrum intake from its own mother, potentially compromising its health and performance later on.

Conclusions

Colostrum is essential for the care of neonatal piglets, as it provides the immunity, nutrition, and energy they need for a strong start in life. Swine producers who prioritize colostrum intake through effective management practices can enhance piglet survival and growth, which ultimately improves the overall productivity and profitability of their herds.

Key management strategies include ensuring proper feeding, ensuring vaccinations are up-to-date, and managing stress levels. These practices are crucial for optimizing both the quantity and quality of colostrum from the sow. Investing in colostrum management during lactation is critical for sustainable and efficient swine production.

In general, piglets that receive adequate colostrum experience improved growth rates and reduced susceptibility to diseases. Furthermore, those that are future breeding females are more likely to develop better reproductive health, contributing to a healthy and productive herd.

https://www.hypor.com/en/articles/the-importance-of-colostrum-in-swine-production/

Supplements to Help Mom When Things Don't Go Well

These are some over-the-counter options to help Moms.

CMPK: sold as a liquid or oral gel that contains Calcium, Magnesium, Potassium, and Sodium. This provides Mom a boost of necessary minerals. Often sold in doses for cattle and must be adjusted for other species.

Bloat Gel: for ruminants. Reduces bloat, especially frothy bloat by binding and decreasing the froth in the rumen.
https://www.msdvetmanual.com/digestive-system/diseases-of-the-ruminant-forestomach/bloat-in-ruminants#Treatment_v3262461

Vitamin E, D, A: Animals generally are able to consume these vitamins in appropriate quantities from a healthy diet. However in times of stress they may need extra. A quick way to boost the animal's vitamin E, A, and D levels is to administer an injectable form of these vitamins. They enter the body and the bloodstream quickly and avoid having to be absorbed by the gut.
https://www.neogen.com/en/usac/neocenter/blog/cattle-and-vitamin-e/?srsltid=AfmBOooC7xQS1T_Xo-As4cYBliFSG4hSiyyPKzNWwR7Dj6OPsWMOOFnm

Vitamin B: injectable Vitamin B, boosts animal's appetite during times of stress. For all livestock species.
https://www.pnwanc.org/Portals/0/SiteContent/Documents/Proceedings/2016_07_B_Vitamins_for_Ruminants.pdf

Oats: high energy feed for animals fed hay/pasture rations. Oats are excellent for animals because they provide a highly digestible source of energy, fiber, and essential nutrients (like B vitamins, iron, and antioxidants) that support healthy digestion and weight management. Due to their low glycemic index, they provide sustained energy, and their high linoleic acid content supports healthy skin and a shiny coat in livestock.
https://agnr.osu.edu/sites/agnr/files/imce/pdfs/Beef/OatsAsFeedForBeefCattle.pdf

Alfalfa Pellets/Hay: high in calcium (needed for lactation), higher protein than grass forage.

Molasses: energy boost.

Mastitis

Mastitis is defined as an infected udder from microbes entering the teat via the teat canal.

- Risk Factors: dirty bedding, age of mother, stripping wax plug too early, weaning too early or too quickly
- Symptoms: hot, swollen, and painful udder/quarter, clots in the milk, foul smelling discharge, thickened or curdled milk, fever
- Treatment: antibiotics, milking out the infected gland routinely, reducing inflammation

Mastitis in Cattle

Bovine mastitis is a condition typified by the persistent and inflammatory reaction of the udder tissue due to either physical trauma or infections caused by microorganisms. It is a potentially fatal mammary gland infection that is the most common in dairy cattle worldwide. It is a disease that is known to cause the greatest loss to the dairy industry.

Causes

There is a large cohort of microorganism species that are known to cause mastitis. These range from virus, mycoplasma, fungus and bacteria. Bacterial organisms known to cause mastitis are Pasteurella multocida, Staphylococcus aureus; Str. Zooepidemicus; Str. agalactiae; Str. pyogenes; Str. faecalis; Mycobacterium bovis; Klebsiella spp; Brucella abortus; Pseudomonas pyocyaneus; E.coli; Leptospira Pomona, etc. Fungal entities responsible for mastitis are Aspergillus fumigatus; A.midulus; Candida spp; Trichosporon spp, etc. Physical injury to the mammary region, poor hygiene and/or trauma, also cause this condition.

Symptoms

The clear sign of mastitis is inflammation of the udder that turns into a red and hard mass. The swollen mammary gland is hot and the mere touching causes pain and discomfort to the animal. Animals may not allow touching of the udder, kicking to prevent milking, vocalizing and isolating when in pain. If milked the milk can be tainted with blood clots, foul smelling brown discharge and milk clots. There may not be any of these qualities early on in the infection. The milk yield totally stops or is severely restricted. Body temperature of the animal increases. Other symptoms are lack of appetite, hindrance in mobility due to swollen udder and pain. The dairy animal develops sunken eyes, suffers from digestive disorders and diarrhea. Infected cattle are severely dehydrated and suffer from weight loss. In cases of severe infection there is formation of pus in the infected udder. Mastitis can degenerate to Toxaemia or Bacteraemia and even cause death as a result of acute infection.

Mastitis can be detected at an early stage (sub clinical) before the symptoms appear, through California Mastitis Test (CMT). It is a quick test that can be performed on small milk samples. Early detection helps in preventing the progress of the disease into clinical stages and causing heavy losses to dairy farmers.

Prevention

It is better to prevent mastitis before it becomes a problem. The below measures can go a long way in prevention:

- Provide clean, dry and adequate bedding for cows to lie
- Cows should be clean while entering the milking area
- Use different cloth or paper towel for cleaning the teats on each cow
- Teats should be completely dry and clean before milking
- Use germicidal teat dips after milking
- Feed the cows after milking so that they don’t lie down immediately. This prevents the entry of microorganisms into teat canals that are still open from milking.

Treatment

Once mastitis has been detected, treatment involves applying ice cubes/ice pack wrapped in cloth on the udder surface. The infected milk from infected teat should be drained out three times a day and disposed

of. While milking the herd, strict attention must be paid to first milking healthy, non-infected cows and subsequently those infected. If the milk from an infected teat is bloody, discolored or purulent at all, calves should be prevented from suckling on the infected teat. However, keeping the teat milked out is a good way to alleviate the pain and symptoms from worsening so some farmers do allow the calves to continue nursing. A veterinary doctor may need to be consulted, and a course of antibiotic treatment is usually required.
https://www.cargill.co.in/en/mastitis-in-cows-causes,-symptoms,-prevention-and-treatment

Mastitis In Ewes and Does

Mastitis is one of the more common health problems affecting sheep and goats. Severe cases can result in death of the ewe, but more often it takes its toll in the form of treatment costs, premature culling, and reduced performance of lambs and kids.

Mastitis is an inflammation of the mammary gland (udder). It can be caused by physical injury or stress or by bacteria which invade the mammary gland. The bacteria which are known to cause mastitis in cows, sheep and goats are *Streptococcus* sp., *Staphylococcus* sp., *Pasteurella* sp., and coliforms, such as *E. coli*.

Mastitis is usually observed shortly after lambing until the post-weaning period. It can take on several forms. Clinical mastitis (chronic or acute) involves physical changes in the udder. The udder becomes swollen and warm, sometimes painful to the touch.
In severe cases, blood supply to the udder is affected and a blue discoloration may result, hence the name "blue bag." Ewes affected with mastitis become feverish, go off feed and become depressed. They may hold their rear foot up to guard their painful udder, as if they are lame, and refuse to allow their lambs to nurse.

Ewes with sub-clinical mastitis usually appear quite healthy, but there is a reduction in their milk supply and development of lumps (scar tissue) in their udders, hence the name "hard bag." This is probably the most "serious" form of mastitis to the producer, since it often goes undetected. Keen observation is necessary to pick out these cases and prevent the potential damage.

Ewes which show signs of mastitis should be separated from the rest of the flock and treated with antibiotics. It may be necessary to bottle feed their lambs. Treatment usually involves intramammary infusions of antibiotics and systemic antibiotics. It is helpful to collect milk samples from affected ewes to determine the main bacteria involved and the correct medication to use. Treatment should be continued for several days until the clinical signs have gone away.

The udders of ewes should be examined after weaning and before breeding. Ewes with hard lumps in the udders should be culled, as these ewes will become increasingly poor producers of milk. Ewes that can only nurse one lamb should be culled from the flock. There is some evidence as to a genetic component to mastitis.

Mastitis can be controlled with good management and sanitation. Bedding in drop pens, mixing pens and lambing jugs should be clean and dry. There should be good drainage around the barn and lots. Animals should not be overcrowded. The incidence of mastitis is greater in closely confined flocks.
Preventing respiratory disease in lambs may help to prevent mastitis, as *Pasteurella hemolytica*, the bacteria that causes baby lamb pneumonia is a major cause of ewe mastitis. Sore mouth is another

contributing factor, as lambs with mouth lesions can infect their dams and any other ewe they may nurse. The OPP (ovine progressive pneumonia) virus may be involved in cases where both halves of the udder are affected.

Weaning lambs from ewes whose milk production has not declined sufficiently puts severe stress on the udder; therefore proper management at weaning is also necessary to prevent mastitis. After weaning, it is advisable to restrict the feed and water of ewes for 1 to 2 days to rapidly decrease their milk production. Some producers will reduce water and all feed 1 to 2 days before weaning. Others will remove grain from the ration 3 to 7 days before weaning. Delaying weaning until after milk production has decreased sufficiently will lessen the occurrence of mastitis.

https://www.vet.cornell.edu/animal-health-diagnostic-center/programs/nyschap/modules-documents/mastitis-ewes-and-does

Disbudding / Dehorning

Disbudding the kids in your herd so they will not grow up to have horns is a necessary management practice in most herds. Goats use their horns mainly for fighting. Every day, as a regular practice, the members of a herd will butt their heads together to establish a pecking order. If they are horned, injury may occur to one or both of the goats involved. Horned goats may also injure their handlers. Always milk a horned goat in a milking stand with a headlock or stanchion. Otherwise, the goat can accidentally hit your head with her horns if flies bother her and she makes a swipe at her side while your head is against her belly as you milk.

Many goat owners believe that they can eliminate the problem of horns by breeding goats that are naturally hornless (polled). However, some does and bucks that are naturally polled are also infertile and are of no use to the owner, either as breeding stock or milk producers.
A good time to disbud your kid is when he or she is 3 to 7 days old. At this age it is easy to do a good job of disbudding and the disbudding process will also be less of a shock. The horn bud (beginning of the horn) on a young kid can be felt with your finger as a piece of immovable skin fixed on the top of the kid's head. If you buy your kid when it is 3 weeks old, you can still disbud it, but you may need to use a larger diameter iron and leave it on longer and there is more chance of doing an incomplete job and ending up with scurs. Scurs are little, tiny horns. They generally have a twisted or deformed appearance and break off easily.

Disbudding Iron

The most common and recommended method of disbudding is with an electric disbudding iron. This is a circular hot iron that is plugged into a wall socket. The circular tip of the iron should be about ¾ of an inch to one inch in diameter. After plugging in the iron, heat the rod until it is a cherry red color and easily burns a piece of wood. If you trim the hair over the horn buds, disbudding will go faster and cause less smoke. Restrain the kid in a disbudding crate or towel held by a friend. Place the circular end of the iron firmly over the horn buds for 10-20 seconds until you see a "copper ring". This will destroy the horn cells and prevent the horn from growing.
If you do not have electricity available, there are disbudding irons that can be heated by a propane torch or campfire.

Dehorning and Tipping

If the horns are allowed to grow on your goat for a time before being removed, you must dehorn the goat rather than disbud it. Dehorning is much more involved and must be done by your veterinarian. The animal is given an injection to numb the area around the horns. Then the horn is removed by using a small wire saw. This procedure usually involves a lot of bleeding. Where each horn was, a hole is left going down into the goat's head into its sinus cavities. These holes can take a long time to heal. Dehorning is done in late fall or winter to prevent flies from attacking the open holes and laying eggs in them. The eggs will hatch out into little white worms called maggots that will feed on the open sores.

Please keep in mind that the faster the disbudding is done after birth, the less pain it will cause both you and the kid. So, don't wait! Do it as soon as you can distinguish the horn buds. Ideally, kids should be 3 to 7 days old when you disbud them. Kids can be done up to 3 weeks of age but you will need to burn their buds longer and there will be more chance of scurs (small, deformed horns) developing.

Dairy goats with horns are not allowed to enter shows in the United States, because horns are not a standard for any dairy breed. However, some shows will allow you to show meat goats that have had their horns tipped rather than removed. Tipping means the top few inches of horn have been cut off. Hoof nippers used for trimming horse hooves work well for tipping. Tipping should be done at least a month before exhibiting the goat to give the tips time to heal.

Metritis

Infection of the uterus that COULD occur after birth.

Risk Factors: retained placenta, stillborn, need for intervention
Symptoms: elevated temperature, lethargy, reduced appetite
Treatment: immediate antibiotics, pain medications, supportive care

Metritis is a uterine infection that may occur after parturition. The temperature will be high (106-108°F), and immediate and severe antibiotic treatment will be needed. Mothers with retained placentas or dead babies, or one you had to put your hands into, are most likely to develop metritis. This is because disease organisms will have had a chance to gain entry to the uterus. Do not neglect metritis. Serious uterine infections can be fatal or make your mother permanently sterile.

https://cals.cornell.edu/nys-4-h-animal-science-programs/livestock/goats/goat-fact-sheets/reproductive-problems-of-doe

Infertility

Inability to get pregnant or stay pregnant.

Infertility can have many causes. Mothers that never seem to conceive should be examined with a speculum to make sure the uterus is not abnormally small (infantile) or that the cervix opening does not look infected. Does/ewes/cows that come into heat constantly with very short cycles may have cystic ovaries and require hormone treatment.

https://cals.cornell.edu/nys-4-h-animal-science-programs/livestock/goats/goat-fact-sheets/reproductive-problems-of-doe

Tubing Poultry

Step 1: Prepare for feeding
Mix the feed: Create a warm, smooth mixture of poultry pellets, water, and any prescribed medication.
Check the crop: Make sure the bird's crop is empty before starting to feed.

Warm the food: The food should be warm, around 100–105∘F (38–41∘C).

Calculate the volume: Start with a smaller amount (about 1/3 to 1/2 of the estimated crop capacity) and gradually increase it with each feeding. A 60ml syringe is often used.

Step 2: Position the bird and insert the tube
Secure the bird: Gently wrap the bird in a towel, leaving its head and neck exposed, to keep it still. You can hold the bird's breast with one hand to help with stability.

Stretch the neck: Gently stretch the bird's neck upward to align the esophagus.

Open the beak: Use your fingers to gently pull down on the lower beak or jaw to open the mouth.

Insert the tube: Place the feeding tube over the base of the tongue and gently guide it down the right side of the throat, making sure not to push the tongue down. DO NOT INSERT INTO the hole, which is the trachea. If you encounter resistance, remove the tube and try again after a break.

Step 3: Administer the food/water/medicine
Insert the tube: Continue to push the tube until you can feel the end of it in the crop.

Dispense slowly: Slowly depress the syringe plunger to push the food mixture into the crop. Watch to ensure the liquid isn't backing up into the mouth, which could indicate it's going down the trachea.

Pinch and remove: Once the syringe is empty, pinch the tube to stop the flow of food and withdraw the tube straight out.

Step 4: Post-feeding care
Flush the tube: After each feeding, flush the tube with about 15cc of water to prevent clogging, and then replace the plunger.

Monitor the bird: Watch for any signs of vomiting or diarrhea, and if they occur, decrease the volume of food in the next feeding.

Follow veterinary advice: It is crucial to consult with a veterinarian for specific dosage and frequency recommendations for your bird.

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MFMA
Minnesota Farmers' Market Association

www.mfma.org | info@mfma.org