

Section 4: Breeding Management

Lessons included in the *Breeding Management* section of the eLearning tool:

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Key Takeaway:

The overarching goal of cow/calf producers is to improve the fertility of their herd in order to increase the potential for profitability. In other words, to have as many heifers and cows as possible be successfully bred and give birth to healthy calves that achieve a desired weaning weight.

By completing the *Breeding Management* section of the eLearning tool, members will be able to:

- Identify parts of cattle reproductive systems and understand their functions.
- Recall advantages of a short, well-timed breeding season, list considerations for culling cows and choosing replacement heifers and explain how artificial insemination works.
- List methods for performing pregnancy checks.
- Outline a plan for preparing for the calving season, list the stages of parturition and differentiate between normal and abnormal calf presentations as well as explain why colostrum is so important for newborn calves.

Lesson 1: Cattle Reproductive Systems

Diagram: Mature Female Reproductive System - Anatomy and Physiology

Reference Sheet: Mature Female Reproductive System - Anatomy and Physiology

Activity Sheet: Mature Female Reproductive System - Anatomy

Reference Sheet: Estrous Cycle

Diagram: Mature Male Reproductive System - Anatomy and Physiology

Activity Sheet: Mature Male Reproductive System - Anatomy and Physiology

Reference Sheet: Breeding Soundness Examinations

Activity Sheet: Breeding Soundness Examinations

Lesson 2: Breeding Season

Reference Sheet: Timing and Length of the Breeding Season

Activity Sheet: Determining a Breeding Season

Reference Sheet: Culling Cow and Selecting Replacement Heifers

Reference Sheet: Natural Service versus Artificial Insemination

Activity Sheet: Natural or Artificial Insemination

Lesson 3: Pregnancy Checking

Reference Sheet: Pregnancy Checking

Lesson 4: Calving Season

Reference Sheet: Preparing for Calving Season

Reference Sheet: Parturition or Calving

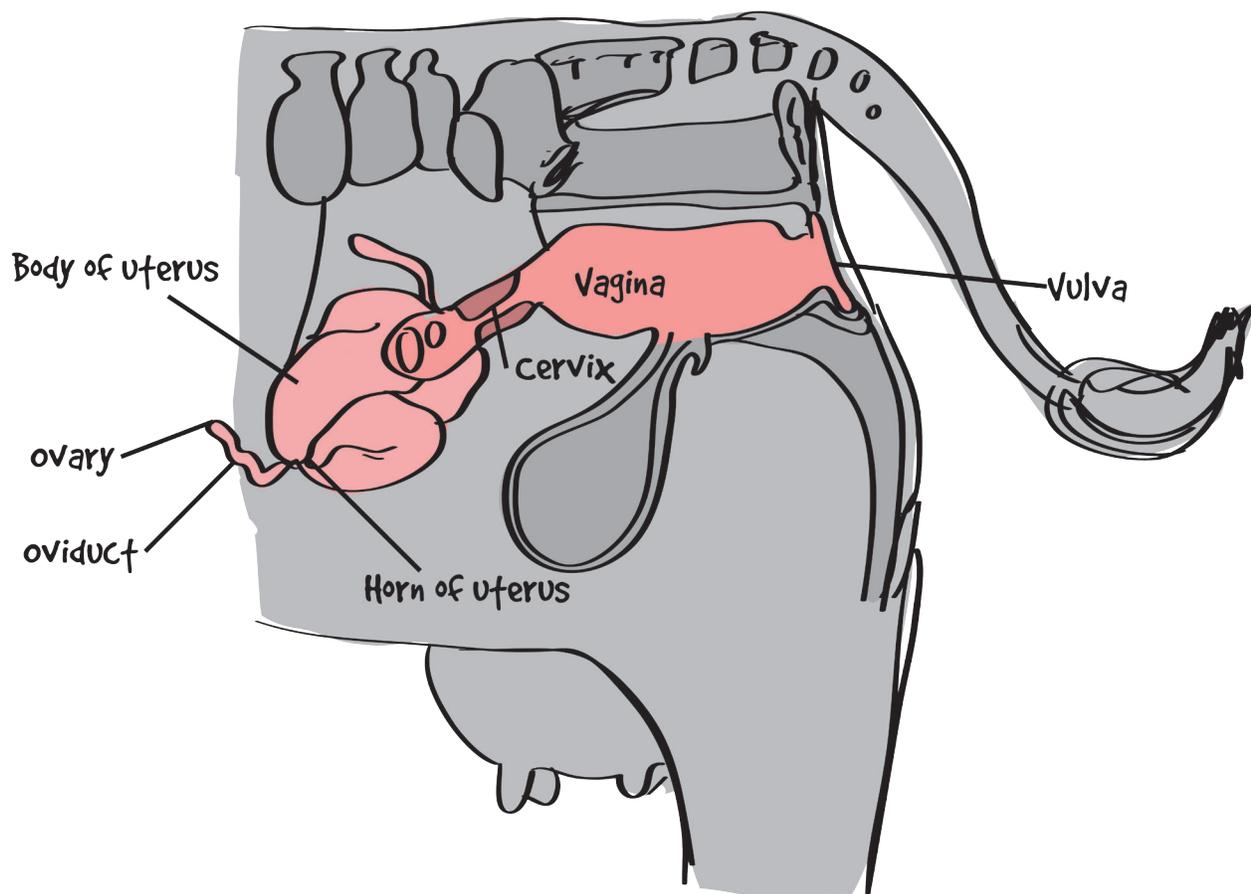
Diagram: Calf Presentation During Calving

Activity Sheet: Is the Calf's Presentation Normal?

Reference Sheet: Caring for a Newborn Calf

Diagram

Mature Female Reproductive System - Anatomy



Reference Sheet

Matuure Female Reproductive System - Anatomy & Physiology

The **ovaries** produce eggs or ovum as well as hormones essential for reproduction.

The **oviducts** are the funnel-shaped tubes where fertilization will occur if both an egg and viable sperm are present at the same time.

If an egg is fertilized, it develops into an embryo and will travel to the **uterus** to implant itself to the wall of the uterus. The main function of the uterus is to provide a suitable environment for fetal development. This is where the fetus will remain until birth.

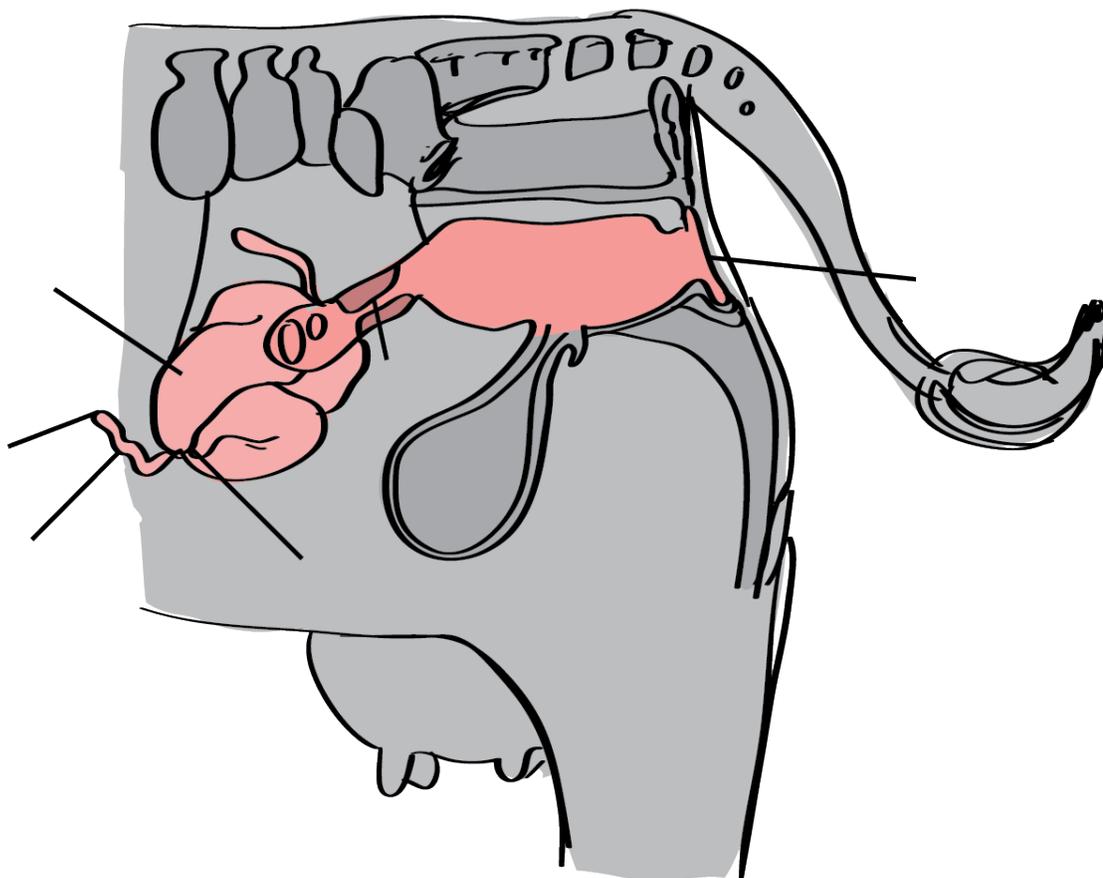
The **cervix's** thick walls and opening to the uterus relax only to create a passageway for sperm to enter and for the calf to travel through during birth. The cervix remains tightly closed during pregnancy.

The **vagina** is the passageway that connects the cervix to the outer opening of the reproductive tract called the **vulva**.

Two of the essential organs for reproduction are located in the animal's brain – the hypothalamus and the pituitary gland.

Member Activity Sheet

Mature Female Reproductive System - Anatomy



Instructions: Label the diagram with the following terms.

Ovaries

Body of the Uterus

Oviducts

Uterus

Cervix

Vagina

Vulva

Reference Sheet

Estrous cycle

An estrous cycle is a series of changes in a mature female animal's reproductive system that happen in response to hormonal and physiological changes also happening in the animal's body.

The length of the cycle is measured as the time between two consecutive estrus or heat periods. The average length of a cycle for mature female beef cattle is 21 days, but a cycle that lasts between 17 to 24 days is still considered normal.

The beginning of the cycle is signaled by the mature female showing signs of being in estrus, or standing heat.

Estrus, or Standing Heat

Estrus, or standing heat, is the time period when a cow or heifer will accept the male. The best way to detect standing heat is to observe cycling cows or heifers for changes in behaviour.

The best time of day for detecting if cows or heifers are in standing heat is early in the morning or evening. Observe them 2-3 times a day, without disrupting their normal behaviour, for approximately 30 minutes.

- Look for the following indicators:
- Stands to be mounted by a bull or other cows, or has mud on her rump and sides.
- Is restless or nervous, may be bawling or more vocal than usual.
- Groups together with other animals in heat.
- Vulva is swollen, and bright red in color.
- A clear, mucous discharge may be observed.

Estrus or heat detection is of utmost importance for successful breeding management. This is due to the fact that ovulation occurs not long after the beginning of a period of estrus or standing heat, and is the optimal time for natural service or artificial insemination to occur for successful fertilization.

If the animal was bred, and fertilization did occur:

- The hormone progesterone will prepare the uterus for pregnancy and the animal will produce chemical signals for the animal's body not to return to estrus.

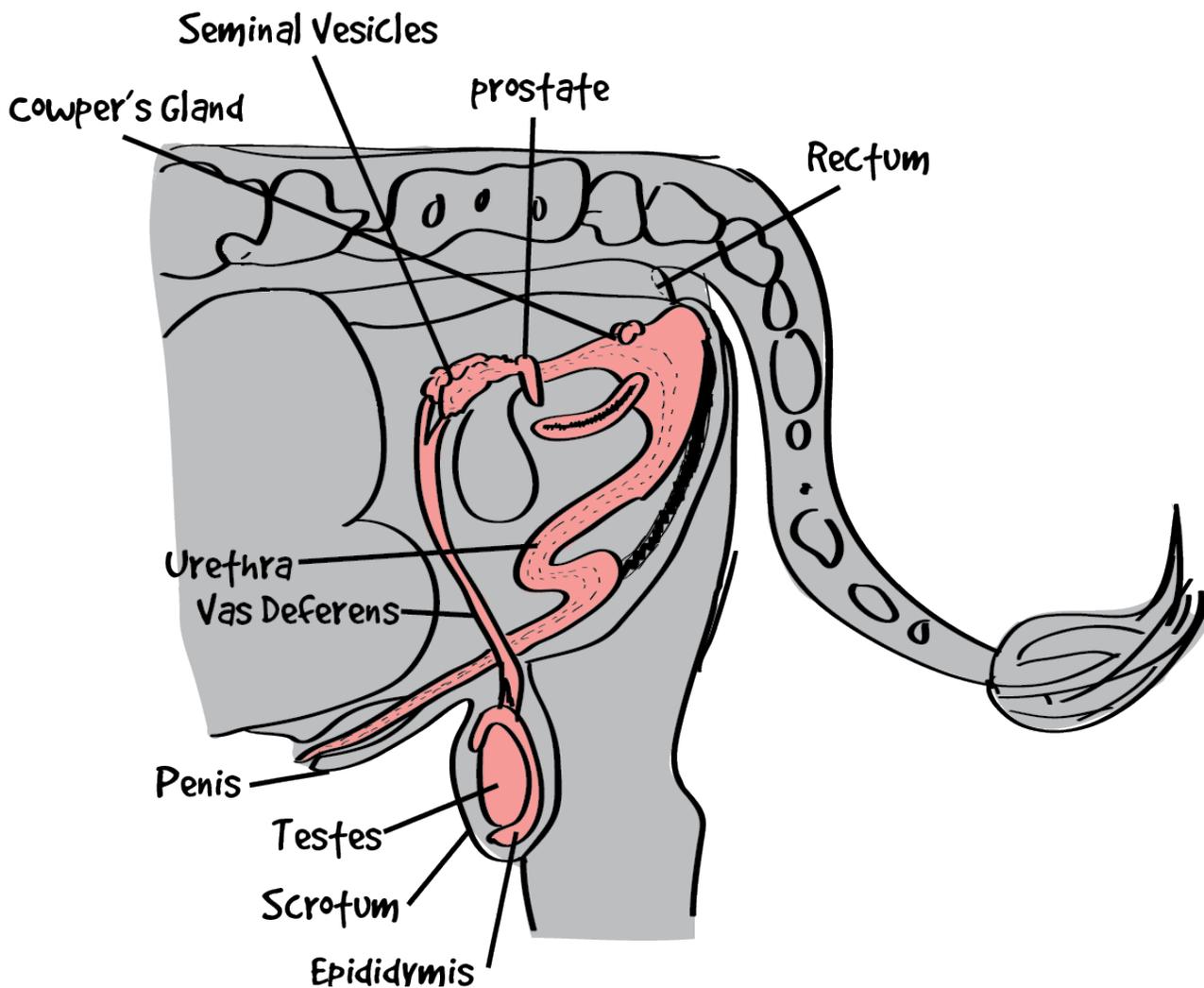
If the animal was not bred, and fertilization did not occur:

- The hormone prostaglandin will be produced and bring the animal back into estrus or standing heat in the next two to three weeks, when the cycle will begin again.

The estrous cycle will repeat over and over until the mature female animal becomes pregnant. Producers need to be aware that some mature female animals do not cycle normally and others may show no signs of estrus. They should talk to their veterinarian if they think that either of these things may be happening.

Diagram

Mature Male Reproductive System - Anatomy



Fact Sheet

Mature Male Reproductive System - Anatomy & Physiology

The **scrotum** provides protection to the testicles and also helps to regulate the temperature for optimum sperm development.

The two **testes** produce sperm, as well as the hormone that gives the mature male his masculine characteristics and appearance.

The **epididymis** stores viable sperm and carries it from the testicles to the vas deferens.

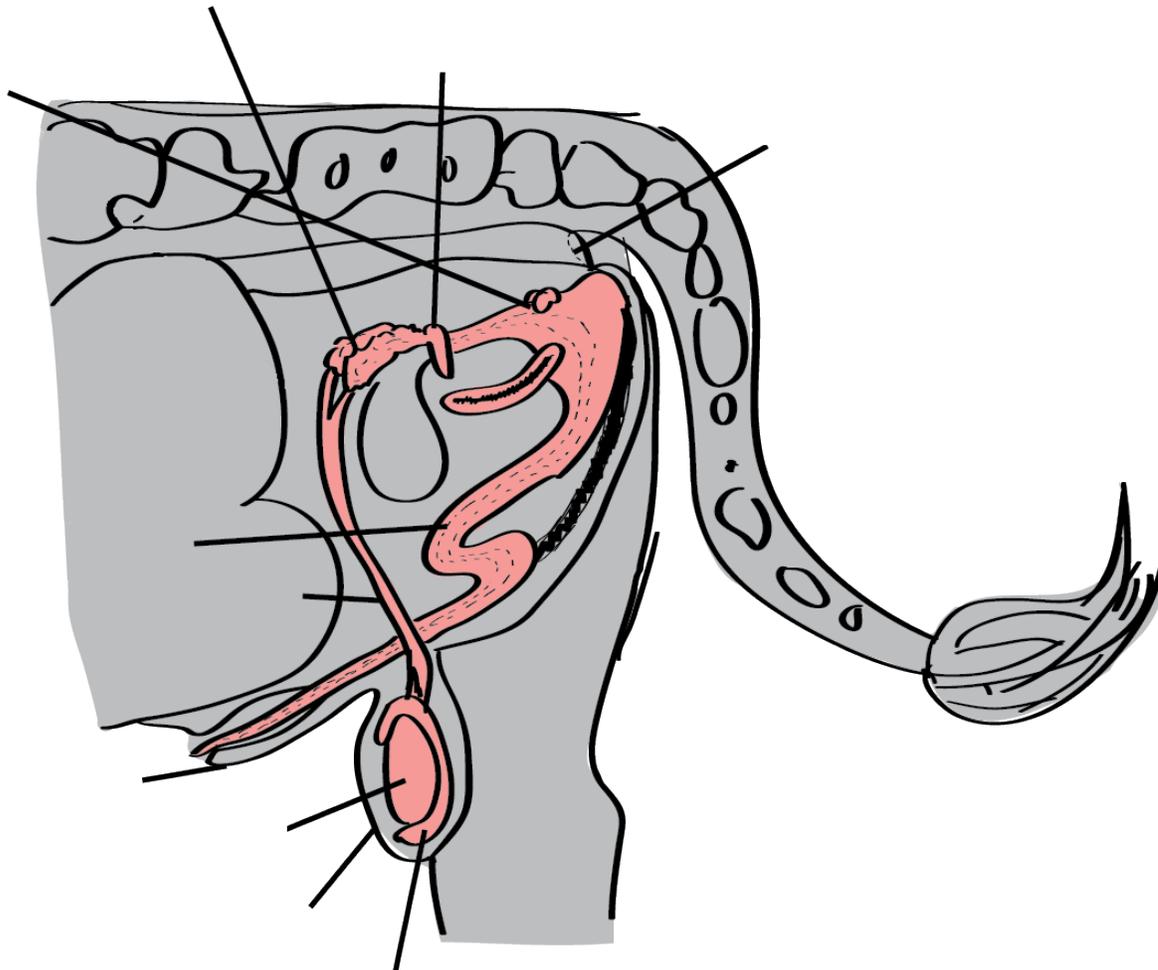
The **vas deferens** unite into a single tube that is called the **urethra**.

The urethra contains the **accessory glands** that secrete fluids that add volume to the sperm, activate them to be mobile as well as flush and cleanse the reproductive tract.

The semen travels out of the body through the **penis**.

Member Activity Sheet

Mature Male Reproductive System - Anatomy



Instructions: Label the diagram with the following terms.

Scrotum

Testes

Epididymis

Vas Deferens

Penis

Seminal Vesicles

Cowper's Gland

Prostate

Urethra

Rectum

Reference Sheet

Breeding Soundness Examinations

Breeding soundness examinations may be conducted to assess whether or not cattle are ready for the breeding season. Breeding soundness examinations should be administered by a veterinarian. It's a small investment that can really enhance a producer's breeding program and therefore profitability.

Breeding Soundness Examinations for Bulls

Prior to the breeding season, it's important to assess the breeding potential of bulls, or herd sires, as they have a huge impact on the overall herd fertility. A breeding soundness examination of a bull involves a:

- Physical soundness examination
- Careful internal and external examination of the reproductive tract
- Semen evaluation

By not conducting Breeding Soundness Examinations, producers risk lower pregnancy rates.

Member Activity Sheet

Breeding Soundness Examinations

Instructions: Answer the following questions on breeding soundness examinations.

Q: Why is it important to conduct breeding soundness examinations?

A: _____

Q: Who should perform a breeding soundness examination?

A: _____

Q: Describe what is involved in a Breeding Soundness Examination for bulls?

A: _____

Reference Sheet

Timing & Length of the Breeding Season

The gestation period for beef cattle is 283 days, approximately nine months. Therefore, producers determine the timing and the length of the breeding season based on what that will mean for the calving season.

Timing of Breeding Season

Producers may choose to calve in the Winter, Spring, Summer or Fall. The decision around the most suitable timing for the breeding season may be based on other farm/ranch commitments, production targets, weather trends and the availability of necessary resources and labour at the time of calving. Not one of the seasons works for all producers.

Length of Breeding Season

A 60-90 day breeding season is the goal of many cow/calf producers, but a shorter breeding season lasting 45-60 days can offer producers a lot of advantages such as:

- To be able to identify cows that need to be culled due to lack of performance more easily.
- Being able to more effectively meet the nutrient requirements of the cow herd during each stage of reproduction, because all of the heifers and cows will be at a similar stage.
- Saving on time and labour required for breeding season and calving season management, because the seasons will be concentrated.
- Calves will be more uniform in age and weight, making calf management easier.
- Calves born earlier in the calving season are typically heavier at weaning than calves born late in the calving season.

Member Activity Sheet

Determining a Breeding Season

Reference: ***When Should I Calve My Cows?***

<http://www.gov.mb.ca/agriculture/livestock/production/beef/when-should-i-calve-my-cows.html>

Instructions: Determining the timing of your breeding season and calving seasons is a major decision, weigh your options carefully!

Winter Calving Season – January, February and March

- When would the breeding season need to take place? _____
- What would be some advantages of a winter calving season?

- What would be some disadvantages of a winter calving season?

Spring Calving Season – April and May

- When would the breeding season need to take place? _____
- What would be some advantages of a winter calving season?

- What would be some disadvantages of a winter calving season?

Summer Calving Season – June and July

- When would the breeding season need to take place? _____
- What would be some advantages of a winter calving season?

- What would be some disadvantages of a winter calving season?

Fall Calving Season – August, September and October

- When would the breeding season need to take place? _____
- What would be some advantages of a winter calving season?

- What would be some disadvantages of a winter calving season?

Reference Sheet

culling cows and Selecting Replacement Heifers

Cull Cows

One of the ways to improve the reproductive performance of the herd is to remove, or cull, animals that aren't performing well.

Producers might consider culling:

- Cows that are open, or in other words, do not become pregnant.
- Cows that calve late in the calving season.
- Cows that lost their calf due to excessive calving difficulty.
- Cows that perform poorly, or in other words, produce poor quality calves.
- Cows that have a poor disposition, poor health, conformation or aren't structurally sound.

Producers often replace culled cows by:

- Purchasing replacement cows, or
- Selecting replacement heifers from their own heifer calf crop.

Replacement Heifers

Producers should consider the following when selecting their replacement heifers:

- Was the heifer calf born early in the calving season?
- What is the heifer calf's estimated mature frame score and size?
- Is the heifer calf structurally sound with good conformation?
- Does the heifer calve have a good disposition?
- Was the heifer calf's dam (or mother) a good producer?

It's important that a proper management plan is developed specifically for these heifer calves as most producers aim for heifers to have their first calve by 24 months. To achieve this goal it's crucial that they manage their heifers, and their nutrition program, so that the heifer calves will gain the necessary weight to come into estrous in order to conceive by the time they are 15 months of age.

Reference Sheet

Natural Service versus Artificial Insemination

Natural service involves the use of bulls to breed heifers and cows. Artificial Insemination, or AI, involves a technician using an instrument to deposit semen that has been collected from a bull, through the vagina and cervix and into the body of the uterus of the heifer or cow. Estrus synchronization is a method often used as part of an artificial insemination program.

Estrus Synchronization

Producers use estrus synchronization to cause groups of cycling heifers and cows to come into estrus and to ovulate at approximately the same time. It's a reproduction management tool that shortens, and helps producers to better manage, the breeding and calving seasons.

When deciding to naturally and/or artificially inseminate their cattle, producers need to think about the advantages and disadvantages of each method before making a decision that works best for their operation.

Member Activity Sheet

Natural Service or Artificial Insemination?

Reference: ***Natural Service & Artificial Insemination***

<http://www.beefresearch.ca/research-topic.cfm/artificial-insemination-17>

Instructions: Determine whether or not natural service or artificial insemination, or a combination of both, is best for your herd.

Natural Service

What are the advantages?

What are the disadvantages?

Artificial Insemination

What are the advantages?

What are the disadvantages?

Would you choose to use natural service or artificial insemination for your operation, or a combination of both? Why?

Reference Sheet

Pregnancy checking

If estrus or standing heat cannot be detected within 17-24 days of being bred, you can generally assume the cow or heifer is pregnant. But many producers test their female animals for pregnancy after the breeding season.

There are a few methods for pregnancy testing out there, with each method varying slightly in terms of who can conduct it, when it can be conducted, how much information you can get from the test, how accurate it can be and how long it takes to find out the results. The most common methods out there are:

- Palpation
- Ultrasound
- Blood or Milk Test

The benefits of conducting pregnancy checks is finding out approximately when the calving season will be, which can help producers to make better management decisions, especially when it comes developing a feeding and nutrition plan based on stage of gestation.

Producers can also use the information to identify fertility or health issues in the herd as well as any open cattle (heifers or cows that are not pregnant and cycle again), which will help to facilitate culling and marketing decision-making.

Reference Sheet

Preparing for Calving Season

Proper management of the calving season is extremely important for an operation! The producer's main goal is to minimize calf losses. Producers must have a plan in place and be prepared in order to prevent calf loss as the birth and the days that follow are the most critical of a calf's life.

Producers can prepare for the calving season in the following ways:

- Proper nutrition management. This is essential to ensuring that heifers and cows are in good body condition going into the calving season.
- A good vaccination program. This should ensure that the dam's immune system can protect the calf.
- Supplies should be accessible and any facilities that will be used during the calving season should be prepared ahead of time.
- The calving area should be clean and dry to limit the spread of disease.

Reference Sheet

Parturition or Calving

Regular observation during the calving season is a must. Producers often separate their heifers and cows, as heifers are more likely to need assistance during calving and therefore should be monitored closely.

Signs that indicate that the beginning of calving season is near:

- Udder fills with milk.
- Vulva relaxes and swells, called springing.
- Cervical plug is lost.

Signs that parturition or calving is going to occur within the next 24 hours or so:

- Relaxation of the pelvic ligaments and
- Behaviours such as isolating herself or not eating.

The three stages of parturition, or calving, are:

1. This first stage is the dilation or opening of the cervix, vagina and vulva. This stage may go completely unnoticed, but at the end of this stage the cow or heifer may raise or switch their tail and there may be an increased mucous discharge from the vulva. She may also isolate herself or stop eating.
2. The second stage has officially begun when you can see the water sac hanging from the vulva, and it ends once the newborn calf has been delivered. The heifer or cow usually lies down during this stage.
3. In the third stage the placenta is shed.

If a producer thinks that the heifer or cow may be having dystocia, or calving difficulty, a good rule of thumb is that if a heifer or cow has been actively labouring but has made no progress, she may need help.

If a producer decides to intervene with the calving process, they must remember that safety and cleanliness are of utmost importance. Using a gentle touch, many producers determine whether the calf's presentation is normal before they do anything. It's important that producers know their limitations and contact their veterinarian if dealing with calving difficulty.

Diagram

calf Presentation During calving

Figure 1 is a diagram of a normal presentation. As you can see, the calf is right side up and facing forward with its head and both front legs extending out towards the vulva. All other presentations are considered abnormal.

Figure 1: Anterior presentation



Figure 2: Breech presentation

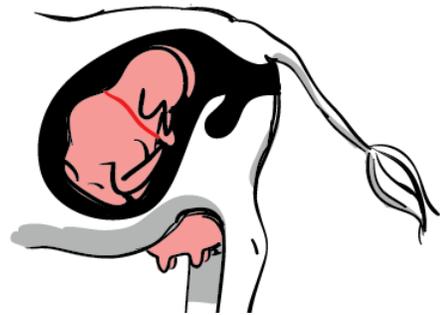


Figure 3: Head turned sideways

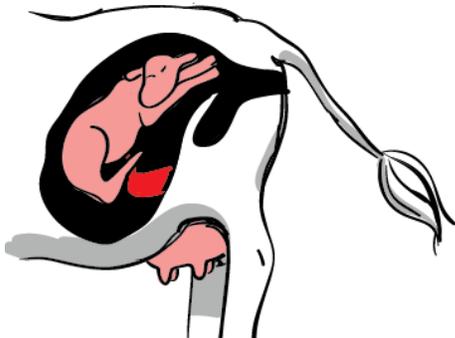


Figure 4: One or more forelegs back

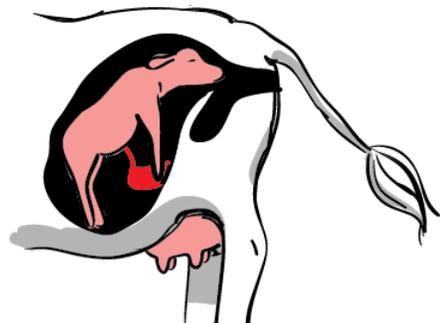


Figure 5 Upside down anterior presentation



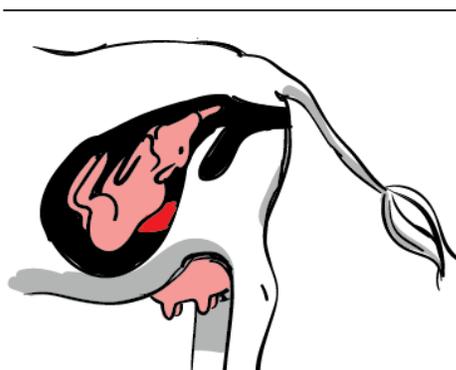
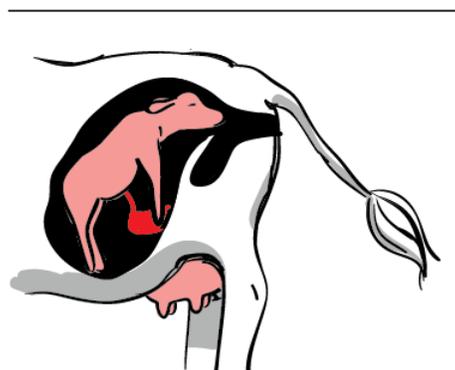
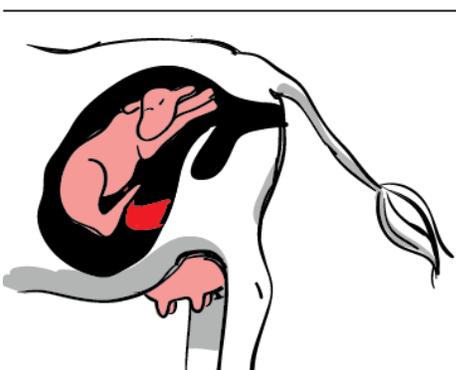
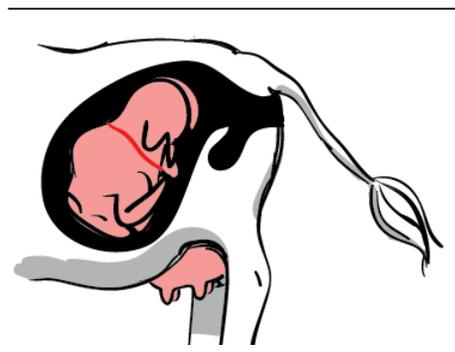
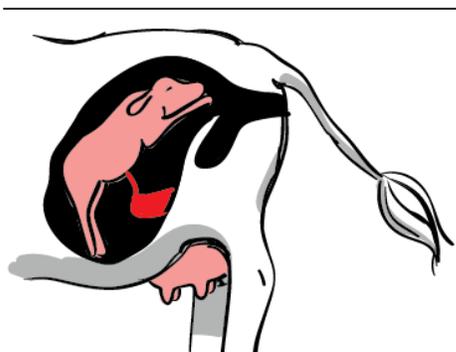
Figure 6: Head Down



Member Activity Sheet

Is the calf's Presentation Normal?

Instructions: Circle and name the abnormal presentations.



Reference Sheet

Caring for a Newborn calf

Colostrum is critical to the development of the newborn calf's immune system because it contains the antibodies necessary to protect the calf from disease. Calves should receive colostrum as soon as possible following birth.

Calves that aren't able to nurse should be given 5-6 % of their body weight in colostrum or commercial colostrum supplements within six hours of birth and the same amount again at 12 hours.

Producers should look over and keep a close eye on heifers, cows and calves following calving. It's important that heifers and cows to recover well from pregnancy and calving so that they return to estrus, and for calves to be strong and healthy.