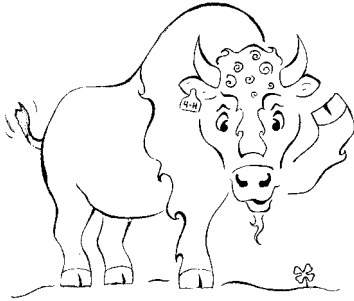


Breeding and Reproduction



Roll Call:

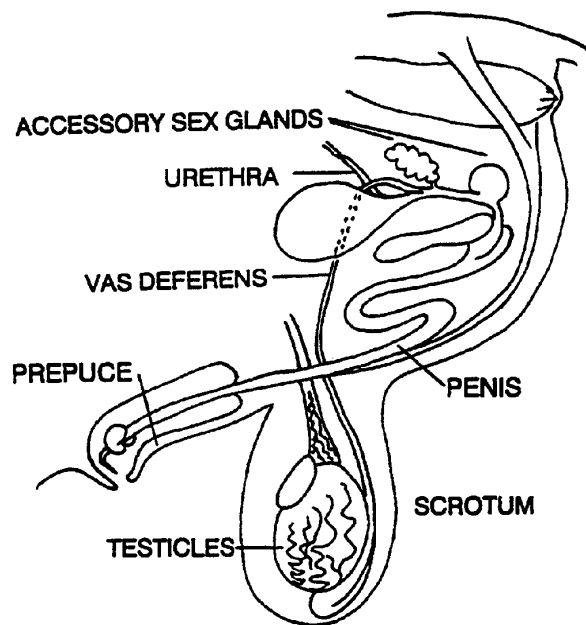
List one thing you must consider when managing your bison herd for fertility.

The Male Reproductive System

A sound breeding bull is important to any herd. Some producers semen test their bison bulls to ensure that they get the absolute maximum production out of their bison calving herd.

The reproductive system of the bison bull is composed of the testes, accessory glands and the penis.

Sperm cells are produced in the testes that are composed of long coiled tubules called seminiferous tubules. These tubules produce sperm through out the lifespan of the bull. The sperm are collected in a network of vessels that meet to form the epididymus, an appendage to the testicle, that is composed of the head, body and the tail. The head is located at the top of the testes and the tail at the lower extremity. The epididymis serves a number of functions, the collection and storage of sperm cells, water absorption to concentrate the sperm and providing a place for the maturation of the spermatozoa.



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The testes also produce a number of hormones that regulate and control the reproductive functioning of the system and influence the development of secondary sexual characteristics.

Sperm cells are transported from the epididymus of the testes to the urethra of the penis in preparation for ejaculation through the vas deferens. The vas deferens is a small tubule connecting the tail of the epididymus to that part of the reproductive system containing the accessory glands, the urethra and the penis.

The scrotum of the bull is the sac that contains the testes. The scrotum protects the testes and insulates the testes from outside temperature fluctuations.

When the sperm cells are transported out of the epididymus in preparation for ejaculation they are mixed with secretions from the accessory glands to form semen. Semen is a mixture of spermatozoa and fluids from the seminal vesicular, prostate and the cowpers (bulbourethral) glands. These secretions provide a media that will act as a carrier for the sperm cells, provide nutrients and a relatively safe environment for the very tiny and fragile sperm cells.

What do each of the accessory glands do?

Vesicular glands

The vesicular glands are responsible for secreting the “gel fraction” to the semen. The majority of the seminal fluid, which is composed of fructose, citric acid, and proteins is secreted by the vesicular glands.

Bulbourethral glands

The bulbourethral glands secrete a mucoid secretion.

Prostate gland

The prostate gland produces a thin watery fluid that cleanses the urethra during the ejaculatory process.

Semen collection and evaluation

Bison bulls are often selected on the basis of performance, progeny tests, frame score and even show ring results. Unfortunately, breeding ability and fertility, the most important aspects of a successful herd sire, can sometimes be forgotten.

Basically semen testing bison bulls, although far more stressful for animal and handlers, is the same as semen testing a domestic beef bull. The veterinarian will follow the same procedure, and in many cases will use the domestic bulls breeding soundness evaluation.

The evaluation is a three-part exam.

1. Palpation – the bull will initially be given an internal examination
2. Scrotal – evaluation will ensure that the bulls testicles are firm and not defected in any way
3. The bull is then ejaculated and the semen is examined under a microscope for quality and quantity. This is done using an electro ejaculator and a sample cup.

Following collection, each semen sample undergoes a gross examination and a microscopic examination. You must take care to avoid destruction of the quality of the semen. Keep it at a constant temperature between 37 and 40 C. Avoid contaminating the urine. Water or chemical disinfectants will decrease both the quality and the fertility level.

Gross examination: Examine the semen with the naked eye for

Colour

- Should be milky white or pale cream
- If the semen has a pinkish or greenish colour and there is blood or pus in the semen, a reproductive tract infection is likely.

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Volume

- A normal ejaculation will provide from 4 to 7 ml of semen

Microscopic examination: Qualified veterinarians and technicians examine the semen with a microscope for:

Motility (motion of the sperm)

- Sperm move forward similar to a torpedo in water
- The higher the motility, the better the quality of the semen

Morphology (structure of sperm)

- If more than 25% of the sperm in a sample are abnormal, fertility will be affected
- Deformed or abnormal sperm may have no head, two heads, no tails or can be unusually shaped

Concentration (sperm cells per volume of semen)

- From 5 to 25 billion sperm may be present in the ejaculate from one bull

Summary

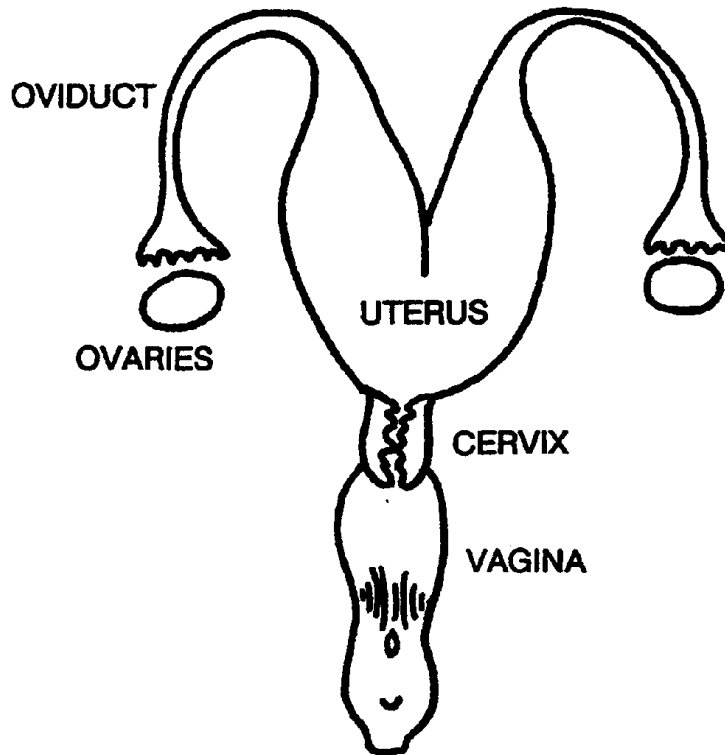
Normal semen has these characteristics:

- Milky white or pale cream in colour
- Volume of 6 ml per ejaculate (range from 2 – 12 ml)
- 0.5 to 2.5 billion sperm cells per ml of semen

The semen test does not test for libido (the ability or desire to breed cows) or infectious diseases.

The female reproductive system

The following diagram shows the reproductive organs of the mature female.



The mature female has two almond shaped organs called ovaries. The ovaries produce eggs and the female hormones. These hormones control the female reproductive cycle.

A coiled tube called the oviduct suspends the ovaries. Fertilization, or the joining of the egg from the female and the sperm from the male, occurs in the oviduct.

The oviduct leads from the ovary to the uterus or womb. Once an egg is fertilized, it enters the uterus, implants in the wall of the uterus and begins to grow.

The lower opening from the uterus is the cervix. The cervix has many folds and interlocking rings. Its main function is to prevent intruders from entering the uterus. The cervix remains tightly closed except during estrus when it relaxes, allowing the sperm to enter. During pregnancy, the cervix remains tightly closed. It relaxes just before calving to allow the calf to exit the female' body.

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The vagina is the tube that connects to the cervix to the outer opening of the body. The bull deposits his semen in the vagina during mating. The vagina is the passage through which the calf exits during calving.

Is your cow pregnant?

Some producers will pregnancy test their females. Pregnancy testing is done to

- Alert the producer to any potential breeding problems in a herd.
- If the herd has a past history of poor reproductive performance.
- Allow the producer to know which cows are producing from those that are not.
- Allow the producer to opportunity to detect any physical problems that individual cows may have.

There are a few different methods of pregnancy testing that have been experimented with in order to reduce the stress to the cows.

These methods include:

- Rectal Pregnancy checking
- Ultrasound Imaging
- Fecal sampling
- Blood sampling
 - Two samples taken ten days apart to detect the presence of progesterone.
 - PSPB – protein in the serum when the cow is pregnant

Because pregnancy testing can cause stress to the cows it is advisable to not pregnancy test prior to 60 days after being bred.

It is also important to have the proper equipment to ensure the safety of both you and the cow.

Calving time

Dystocia, or difficulty in calving may occur at any stage of the calving. There are many possible causes for dystocia.

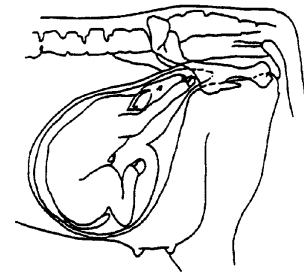
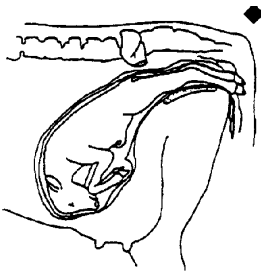
- Incorrect position of the calf
- Abnormalities of the pelvis in the cow
- Distortion of the uterus in the cow
- Very large calf
- Fetal / maternal mismatch may have occurred
- Overly fat cows – It is important to remember that bison cows will normally lose weight during the winter period. Don't attempt to alter this natural occurrence.
- More than one calf (twins will sometimes get limbs tangled)

Dystocia is most often caused by incorrect position of the calf. Remember from the first unit that the normal birthing position of the calf is with the head and front feet toward the opening of the birth canal.

The position of the calf in a normal birth

Although this is a beef cow, it is important to remember that their delivery will be very similar.

A bison cow should also be able to deliver a calf that is backwards, providing that they have both hind legs and the tail coming out first. The only danger with calves born in this position is that the mucus in their lungs does not get drained as readily.



*"One is born into a herd of buffaloes & must be glad if one is not trampled before one's time."
-old proverb*

Dystocia in bison

A few important signs could save your cow when she experiencing dystocia.

- Tail elevated
- Grunt, roll, paw or kick at belly in display of obvious discomfort
- Straining while standing
- She may or may not leave the herd
 - If the herd is calving with no other cover the cow will likely stay with the herd. (A sign of her survival instinct)
 - If the herd is calving in an area with cover she may leave the herd

How long should you wait?

In a normal calving the water bag may be visible anywhere from 20 minutes to 3 ½ hours. This is a time for you to be patient, yet ready to act if needed! Always allow at least 3 ½ hours of straining before intervening. Sometimes her distress may be obvious and other times she may go unnoticed. You should not wait any longer than 6 to 8 hours.

So what do you do if the calf is still not born after all this time? The first thing to keep in mind is that the calf is likely not alive. The main objective now is to save the cow. As calmly as possible the bison cow must be moved into a handling facility, now is the time to call your local veterinarian for assistance.

Remember... the bison cow has a much larger flight zone than the domestic cow!! She will likely be nervous and worked up anyway. Don't attempt to isolate her from the rest of the herd. If possible bring a few others into the main portion of the handling system with you.

It is very important that you resolve the problem as quickly as possible. Once you have the cow properly restrained then:

1. Wash the area by using disinfectant soap.
2. You will need to use lube because the calf will likely be dry
3. You must be careful to not tear the uterus

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The veterinarian may need to perform either a fetotomy, which involves cutting the fetus apart to remove it, or a cesarean section. A cesarean section, which involves cutting open the cow and removing the calf out of the side then re-stitching her, will need to be performed if the calf is bloated inside cow because the toxins in the calf could poison the cow if they are expelled inside her. Both of these procedures can be timely, and there is still a risk that stress, or contamination may occur and the cow may die.

Alternate plan:

In preparation for calving season, you should consult your veterinarian and develop a plan of action in the event that a cow should need assistance. Some vets will anesthetize a bison female to give them an opportunity to work on the cow without having to move her. Using a special drug combination will allow the vet to knock the bison out for approximately one hour, a successful reversal brings her back. However it is suggested that the reversal drug be giving intramuscularly, as opposed to intravenously, unless the handlers can reach a safe location in less than a minute as the response will be quick. This will need to be well planned out with your veterinarian in advance.

If you do dart a cow out in the pasture, be sure to keep the herd away. The social nature of the bison herd may instinctively cause the herd to try and interfere. The vet will have the appropriate instruments and may also provide an additional supply of oxygen depending on the drug combination, as some drugs will decrease the level of oxygen in the blood.

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Killer bulls?

You may have heard at some point that bulls kept in with cows that are calving will trample calves to death. Do you think the bulls are really seeking out the calves to kill? Of course they are not. When a cow calves, her body releases the hormone estrogen from the graafian follicle. The increase level of estrogen, and a release of a sexual odour, or pheromone communicate to the bull that the cow is ready to be bred. Bison bulls are aggressive about breeding, and as a result may bunt the calf out of the way, or even end up stepping on it.

The best way to prevent calf loss, due to injury at calving time, is to separate off the bulls and only allow them in with the cow herd at breeding season. This may require a little extra housing facilities, but it may be your best solution.

