PREGNANCY DIAGNOSIS

Agriscience 332

Animal Science

#8818-C

TEKS: (c)(4)(D)

Introduction

To maintain a successful cow-calf operation, it is necessary for the producer to have a high-percentage calf crop each year that offsets the maintenance cost for all cows.

Photo by Scott Bauer courtesy of USDA Agricultural Research Service.

A technique called palpation helps the producer determine which cows are not bred.

The producer can cull the non-pregnant cows from the herd and prevent unnecessary costs that decrease returns to the enterprise.

Pregnancy diagnosis is an important tool to measure the success of reproductive management of a cattle herd.

Rectal palpation is probably the most commonly used method for pregnancy diagnosis.

Palpation is the procedure of feeling the reproductive tract.

Although the technique of palpation is relatively simple, the use of breeding records greatly increases the accuracy of the diagnosis and speeds up the palpation process.

Knowledge of when a cow was bred gives the producer some idea as to the stage of pregnancy, but only if the cow conceived.

Most producers consider rectal palpation to be the fastest and most accurate method to diagnose pregnancy in cattle.

Equipment Necessary for Palpation

The following equipment is needed to safely palpate a cow:

- Protective covering for palpator,
- Lubricant, and
- Chute.

Protective Covering for Palpator

Because the palpator must insert the hand and arm into the cow's rectum, it is necessary to cover those body parts.

Disposable plastic sleeves are used for that purpose.

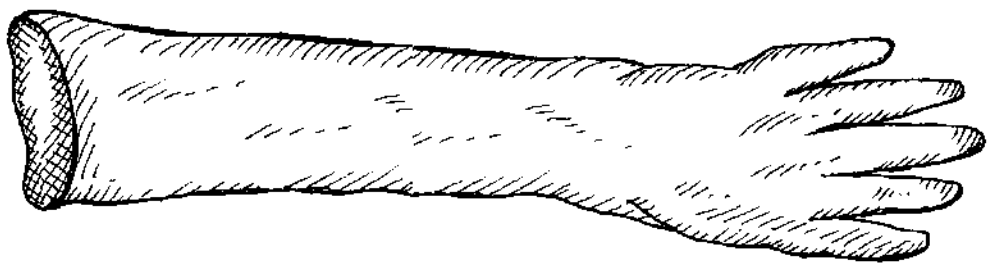
It is also recommended that the palpator wear protective clothing, such as cover-alls and rubber boots.

Lubricant

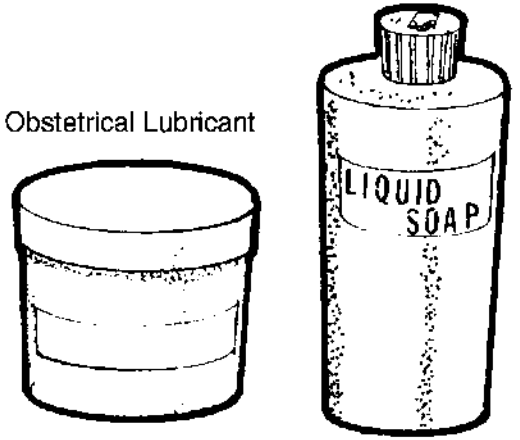
A lubricant is applied to the covered hand and arm to facilitate entry into the cow's rectum.

Commercial obstetrical lubricants are available at farm and ranch supply stores.

A mild liquid soap can also be used as a lubricant, because it provides a slick covering over the arm and does not irritate the cow's rectal cavity as do some detergents.



Plastic Glove



Lubricants

Chute

The cow should be identified and restrained properly before palpation begins.

A holding chute will allow the cow to stand on the ground in a normal position to prevent any unnecessary physical stress.

A gate or brace in front of the cow will prevent her forward movement.

A pipe or pole should be inserted through the chute behind the cow's legs and approximately four inches above the hocks to prevent the cow from backing and keep the palpator from being kicked.

An entrance gate alongside the chute should open to the inside of the chute to close off other cows behind the cow being palpated.

The cow’s head should not be placed in a stanchion or head gate, as this tends to excite the cow.

If the chute’s floor is concrete or wood, then cleats or cross-slats should be constructed to prevent the cow from slipping.

The Reproductive System and Palpation

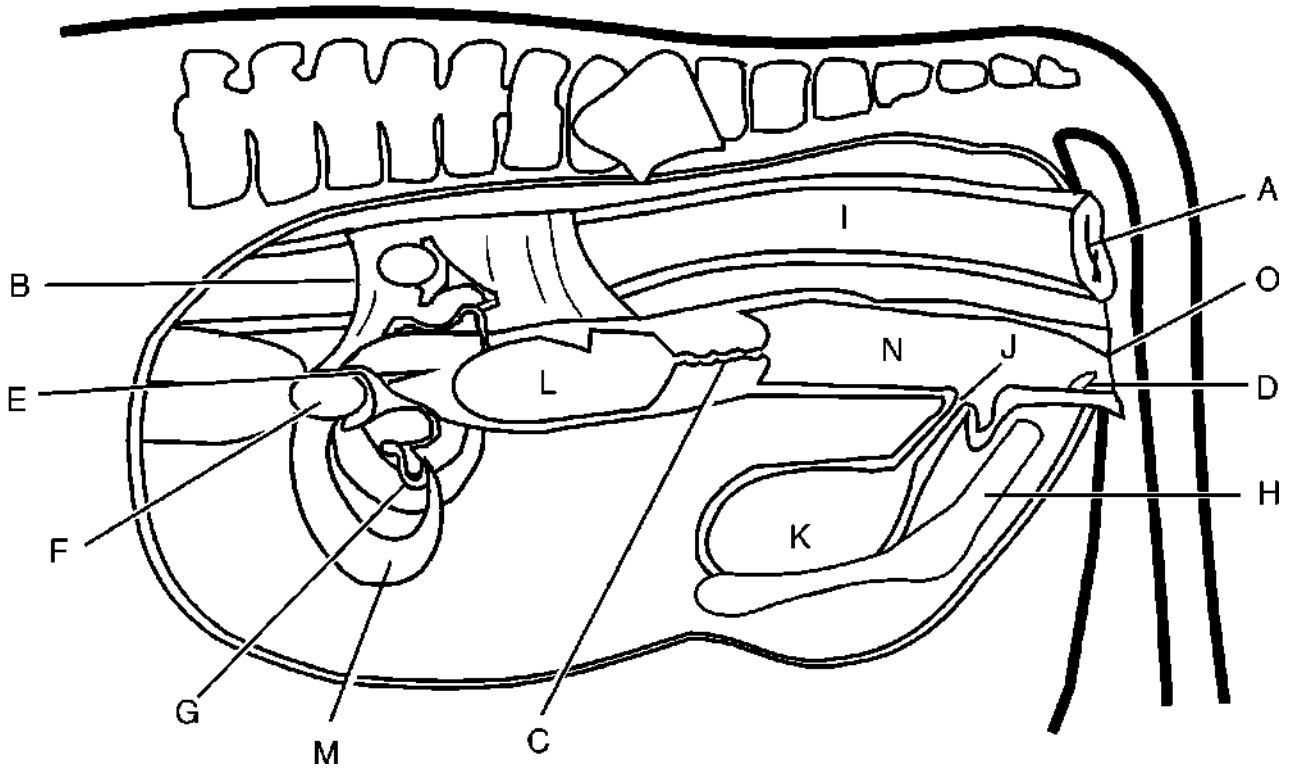
Determining pregnancy in cattle is not particularly difficult, but it requires experience, practice, and a thorough knowledge of the cow's reproductive system.

To accurately determine pregnancy, the palpator inserts the hand into the cow's rectum, locates the reproductive tract through the rectal wall, and determines whether pregnancy exists by examining the condition of the tract.

Because palpation is performed by sense of touch, the palpator must know the location of the cow's reproductive organs and how those organs feel at different stages of pregnancy.

FEMALE REPRODUCTIVE SYSTEM

A. Anus
B. Broad ligaments
C. Cervix
D. Clitoris
E. Infundibulum
F. Ovary
G. Oviduct
H. Pelvis
I. Rectum
J. Urethral opening
K. Urinary bladder
L. Uterine body
M. Uterine horn
N. Vagina
O. Vulva



Anatomy and physiology of the female reproductive tract is discussed in lesson #8405. This lesson will discuss the reproductive anatomy as it relates to palpation.

Vulva – the external portion of the female reproductive tract.

Although of no importance in palpation, the vulva is an indicator of the latter stage of pregnancy, at which time the vulva is swollen and more prominent.

Vagina – located just inside the vulva, the vagina may be the first organ felt during palpation because it is directly under the rectum.

The vagina is thin-walled and may feel like a soft, spongy cylinder, if the palpator is able to feel it at all.

Cervix – located at the upper end of the vagina, extending towards the uterus.

The cervix is an important "landmark" in palpation and is usually easy to locate because of its hard, gristly feel.

Uterus – lies directly in front of the cervix.

The body of the uterus is connected to the two uterine horns, which give it a characteristic "Y" shape in cattle.

The fertilized egg implants itself in the wall of one horn.

The palpator can follow the two horns by beginning at the upper end of the cervix and feeling the horns to their respective ends.

A horn is larger at the lower end and tapers in size toward the upper end.

Location and feel of the uterine horns depend upon the stage of pregnancy and the cow’s age.

Oviducts – (fallopian tubes) located at the upper ends of the uterine horns, the oviducts connect the uterine horns to the infundibulums.

Ovaries – suspended in the body cavity by ligaments attached to the top of the abdominal cavity, the ovaries are near the ends of the fallopian tubes on each side of the body cavity.

In a normal cow, an ovary is ½ inch wide, ¾ inch deep, and 1 inch long.

When palpated, the ovary feels firm.

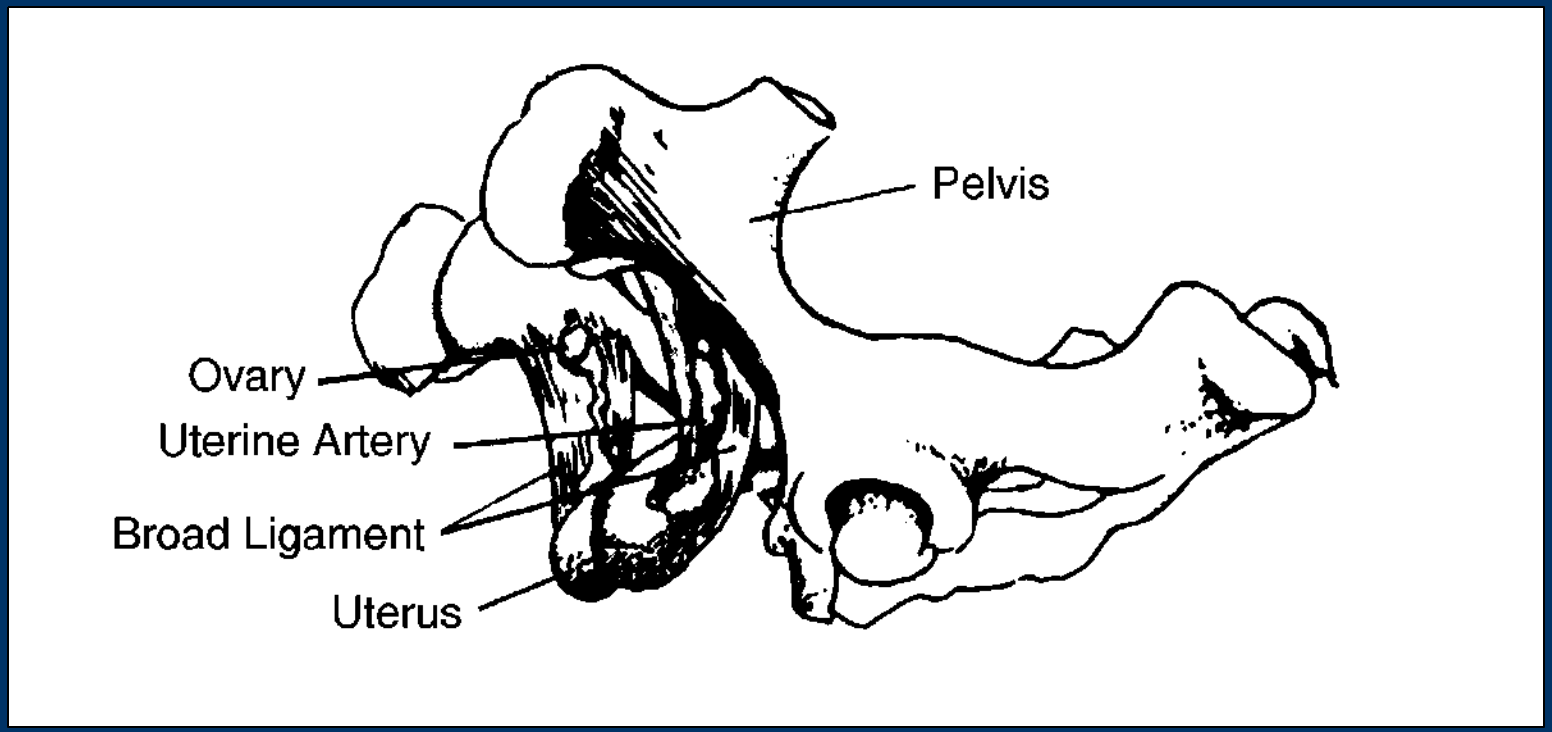
The egg develops in a follicle on the ovary wall.

A follicle feels similar to a fluid-filled bubble.

Pelvis – a bone cradle for the reproductive system, the pelvis is stationary and makes an excellent "landmark" for the palpator to establish orientation and direction in palpation.

The palpator can feel the pelvis by pressing down through the rectal wall.

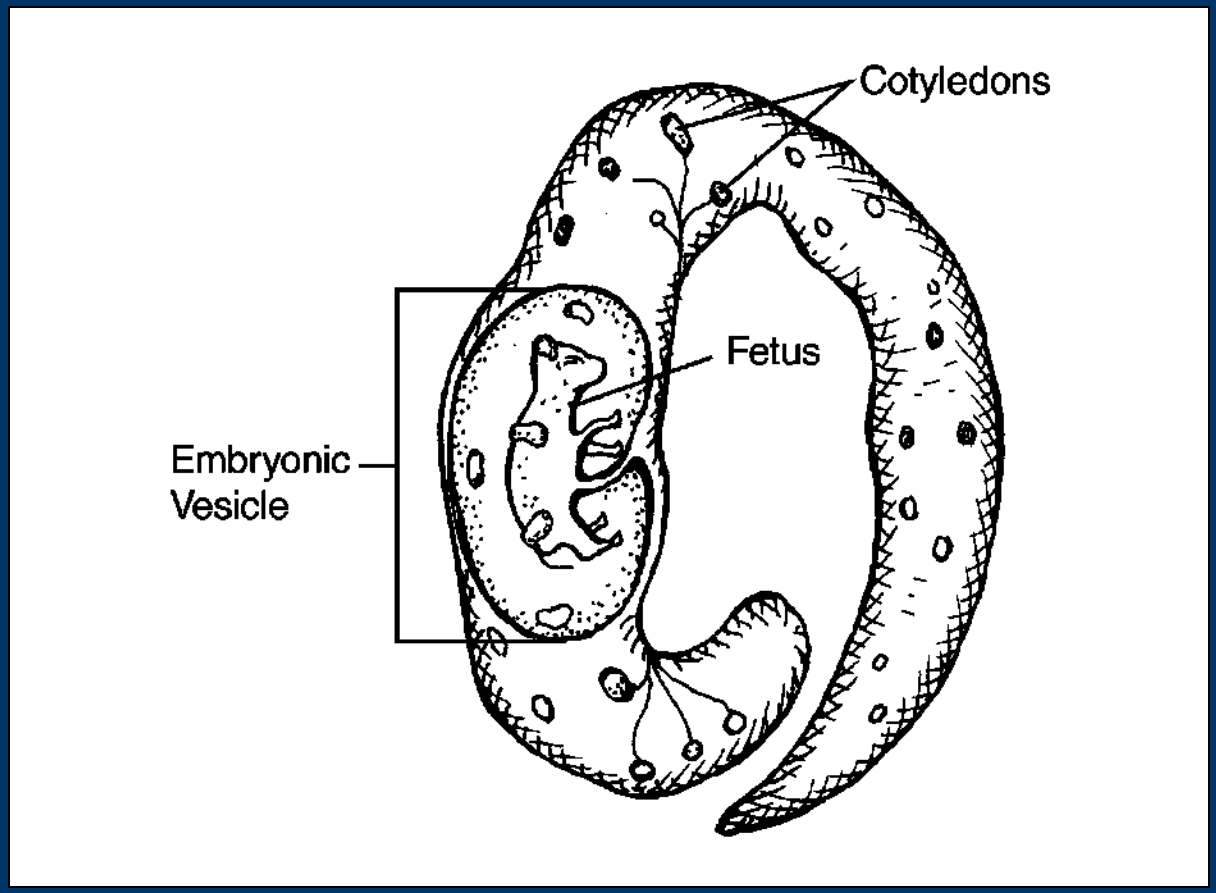
As pregnancy advances, the cervix and uterus move down over the pelvic ridge and into the body cavity.



Embryonic Vesicle – a thin membrane filled with fluid and the embryo; the embryonic vesicle serves to protect the embryo and nourishes it until it attaches and becomes a fetus.

The embryonic vesicle forms around the fertilized ovum after it has moved into the uterine horn.

The embryonic vesicle causes an enlarged area in the horn.



Cotyledons – soft, button-like nodules on the fetal membrane that attach to the caruncles lining the uterus during fetal development.

Caruncles – flattened, oval, raised prominences that line the wall of the uterus and serve as connecting points for the fetal membrane.

After connecting to the cotyledons, the caruncles serve as a nutrient and waste exchange site between the fetus and its mother.

Broad Ligaments – elastic-like ligaments that support the uterus, ovaries, and other organs of the female reproductive tract, as well as, arteries, veins, and nerves.

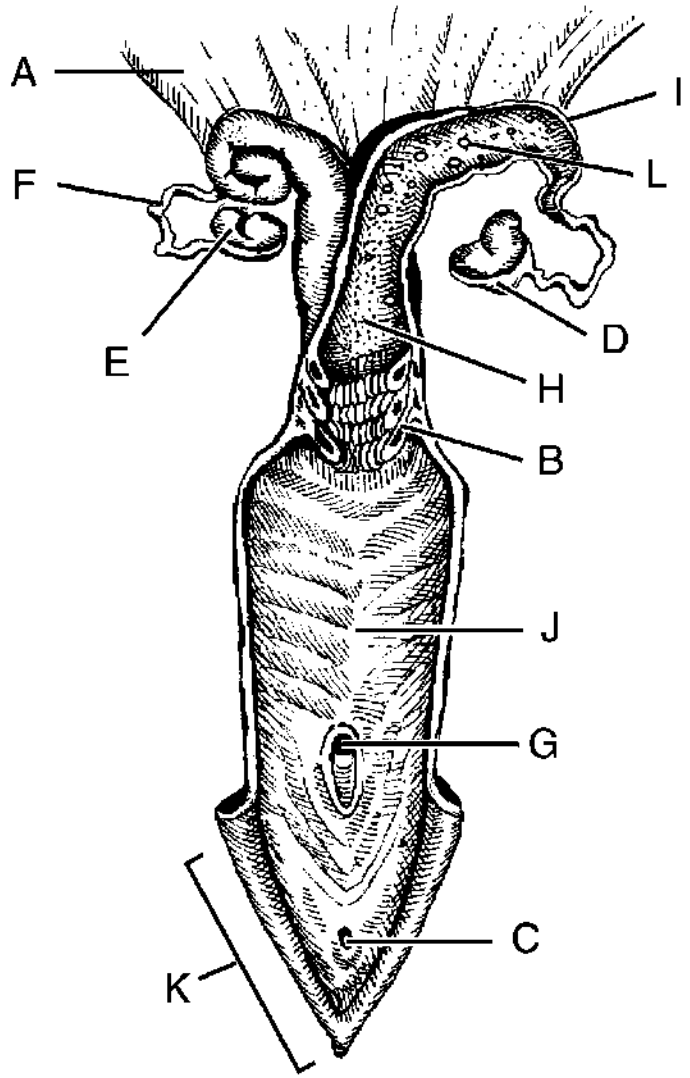
The broad ligaments allow the reproductive tract to move, adjusting to the increase of weight and size of the reproductive organs during pregnancy.

Uterine Artery – the main blood supply to the uterus.

The artery supplies each horn and is the main blood supply from the mother to the developing fetus.

CROSS-SECTIONAL VIEW OF COW'S REPRODUCTIVE SYSTEM

A. Broad ligaments
B. Cervix
C. Clitoris
D. Infundibulum
E. Ovary
F. Oviduct
G. Urethral opening
H. Uterine body
I. Uterine horn
J. Vagina
K. Vulva
L. Caruncles



Palpating

Rectal palpation should be performed with care to avoid damaging the fetus and the cow's rectum.

Palpation may be done with either hand.

One hand may be used to grasp the cow's tail to use as leverage to push the other hand into the rectum.

The covered, lubricated hand should be shaped into a wedge by bringing the fingers close together.

The wedge-shape of the hand helps in the initial thrust into the rectum.

As the hand goes through the cow's rectum, the hand should be formed into a cone to push aside fecal material and straighten the folds of the rectum.

Beginning palpators find it helpful to clean the fecal matter from the cow's rectum, as this increases the sense of feel.

The cow will naturally strain against the palpator's hand.

The palpator should allow the muscle contractions to subside, and then continue pushing the hand through the rectum.

Feeling through the rectal wall is similar to feeling through a layer of thin rubber.

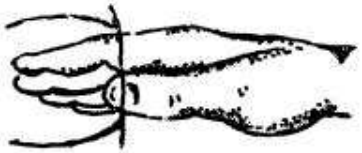
The thickness varies slightly with individual cows and varies greatly among breeds.

The heavier breeds, such as Simmental, Limousin, Chianina, and Maine Anjou, usually have thicker rectal walls than do smaller breeds.

The larger body cavity of the heavier breeds also presents difficulties in locating the reproductive tract after the palpator's hand passes the pelvic ridge.

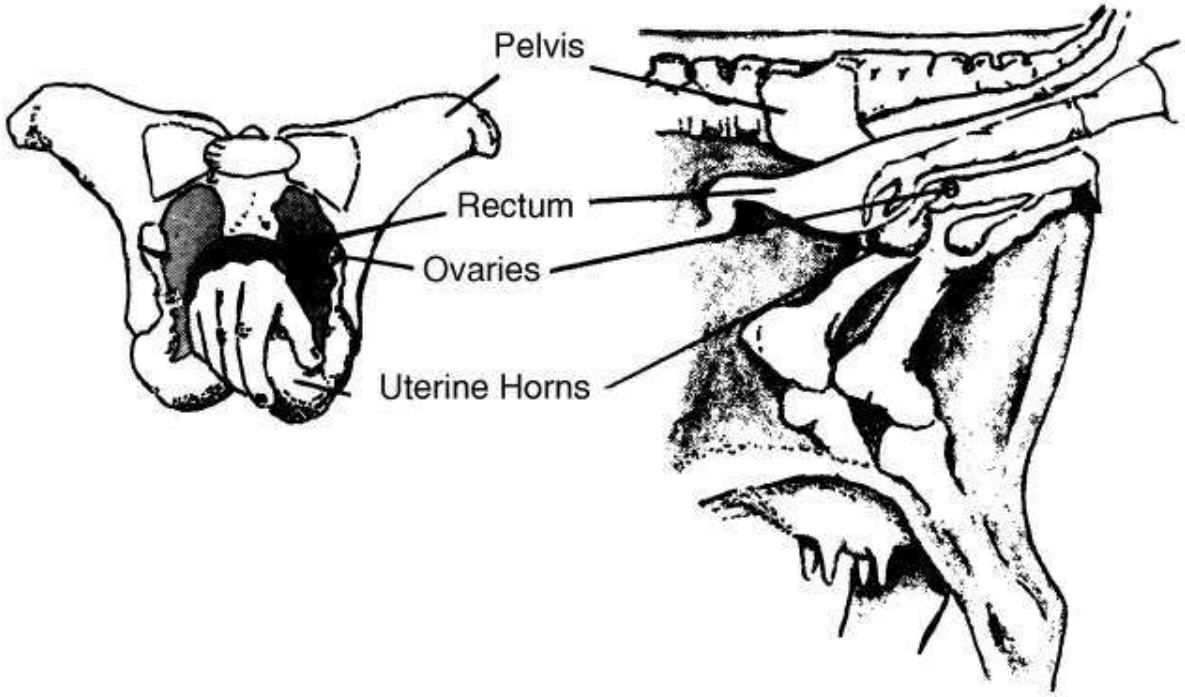
In addition to breed, the cow's age, condition, and overall size influence the ease of palpation.

POSITION OF THE HAND IN PALPATION



Inserting the hand into the rectum

Pushing the fecal matter aside



The palpator should locate a point of orientation immediately after entering the rectum.

The cervix is an important internal landmark for palpators.

Locating the cervix facilitates finding the other organs to be palpated.

The pelvic ridge is another helpful internal landmark.

If the cow is not pregnant, the reproductive tract normally will lie just to the rear of the ridge.

In older cows, the uterine horns of the open tract may hang slightly over the pelvic ridge.

As pregnancy advances, the cervix and uterus move over the ridge and into the body cavity, thus requiring the palpator to feel past the ridge and downward.

Determining Stage of Pregnancy

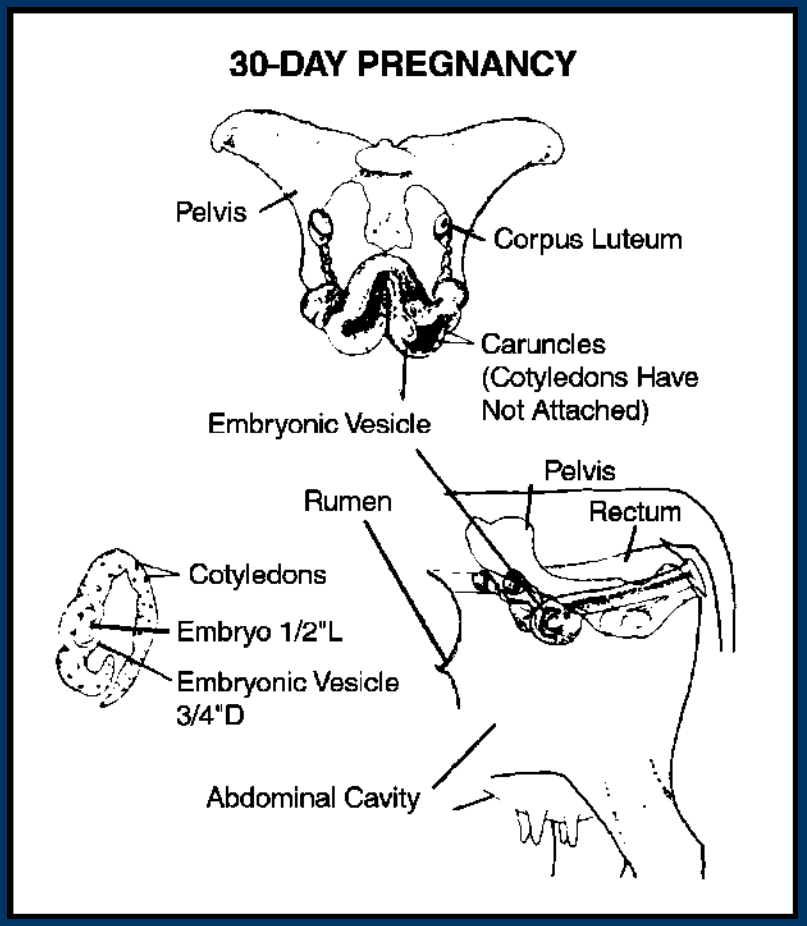
30-Day Pregnancy

Determining pregnancy at this early stage takes a great amount of skill and practice.

Good breeding records provide a guide to the palpator at this stage.

In 30-day pregnancy, the uterus will be filled with fluid and feel slightly thinner.

One horn will be enlarged a little more than the other.



By running each horn between the fingers, the enlargement in one horn can be felt.

This enlargement in the horn is the embryonic vesicle.

The spherical vesicle is nearly ¾” in diameter and is filled with fluid.

In most cases, on the side of the uterus (uterine horn) that the vesicle is found, a corpus luteum on the ovary will also be found.

The corpus luteum will be a hard, teat-like projection on the surface of the ovary.

At this stage of pregnancy, the reproductive tract will still lie on the floor of the pelvis.

45-Day Pregnancy

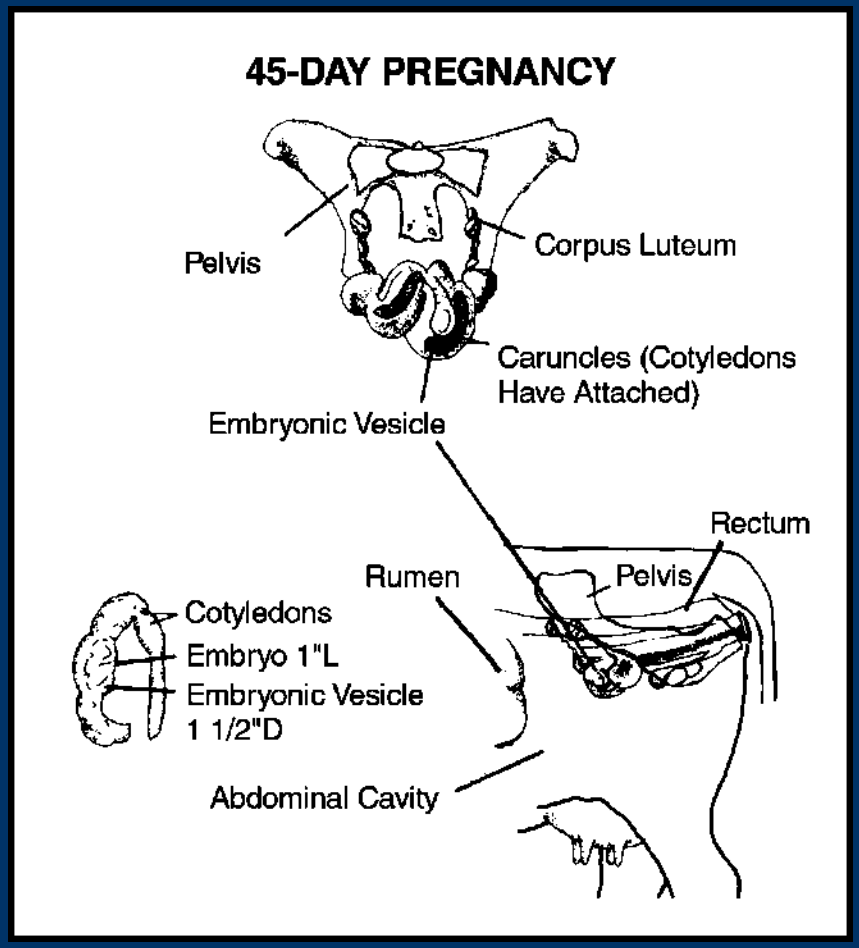
The embryo attaches to the uterine wall on approximately the 38th day of pregnancy.

From this time on, it is called a fetus.

In this stage, the fetus is nearly 1" long and is surrounded by a somewhat egg-shaped vesicle that measures 1" to 1 ½" in length.

The uterine horn containing the fetus is larger and thinner walled.

Vesicle membranes begin to attach themselves to the caruncles on the uterine wall.



The palpator must be careful and not move the fetus about in the uterus.

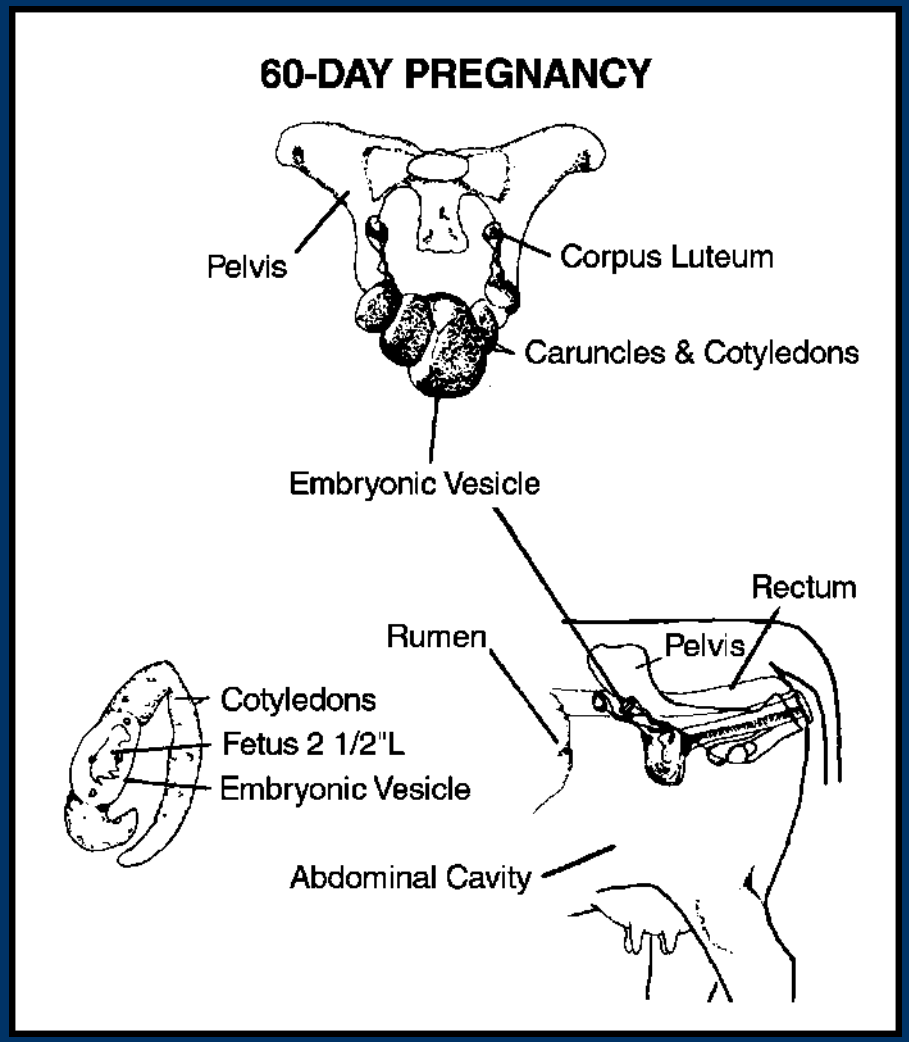
Excessive movement at this time could break the attachments (cotyledons to caruncles) and cause the death of the fetus.

60-Day Pregnancy

The uterus has now enlarged until one horn is approximately the size of a banana and measures 8” to 10” long.

The weight of the fetus and other contents has pulled the uterus over the pelvic ridge into the body cavity.

The fetus measures 2 ½” in length and the embryonic vesicle is still prominent.



The best method of feeling the fetus at this stage is to gently tap the uterus with your hand.

This causes the fetus to swing back and forth and bump against the embryonic vesicle and uterine wall.

The palpator can feel the bumping.

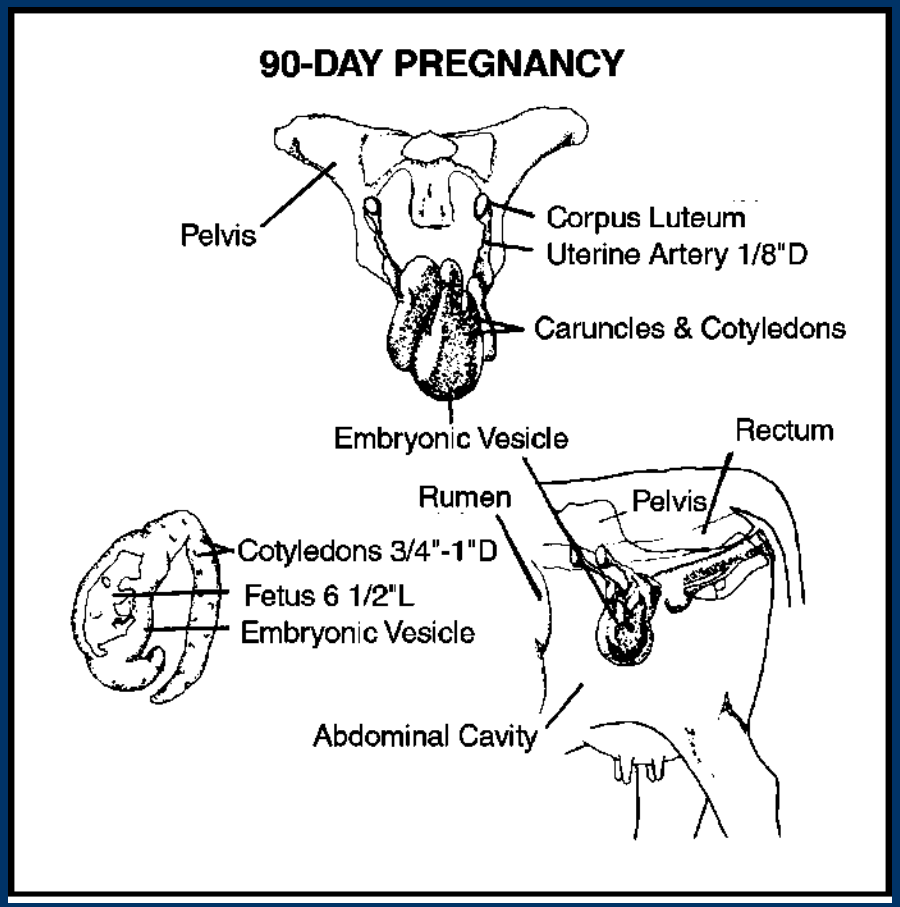
In the 60-day pregnancy stage, the cervix is still in the pelvic cradle and the ovaries suspend rather high in relation to the uterus.

The corpus luteum will again be found on the ovary corresponding to the enlarged uterine horn.

90-Day Pregnancy

The uterus in this stage is considerably larger because of increased fluid and fetal growth.

The fetus is now nearly 6 ½" long and is located on the floor of the body cavity.



The cervix may have pulled itself over the pelvic ridge and into the body cavity.

The stretched uterus has pulled the ovaries down.

The ovaries may be palpated on either side of the uterus.

Because of the low position of the uterus, palpating the fetus in this stage may be difficult.

The palpator may have to consider other factors to confirm pregnancy, such as palpation of the uterine artery.

This artery is located in the forward fold of the ligament that supports the uterus.

At this stage, the uterine artery is 1/8” to 3/16” in diameter and has a characteristic “whirring” pulsation as the blood moves through it.

It can be felt by pressing it against the left forward side of the pelvis.

Care must be taken not to confuse it with the femoral artery, which lies in the muscle of the thigh.

To confirm the presence of the uterine artery, attempt to move it from side to side.

The femoral artery cannot be moved and does not have the “whirring” pulsation of the uterine artery.

Perhaps the best indication of pregnancy at this time (in the absence of the fetus) is the presence of the cotyledons on the uterus.

They may be felt as flattened, egg-shaped masses on the uterus.

A cotyledon feels slightly firmer than the uterus and measures ¾” to 1” across.

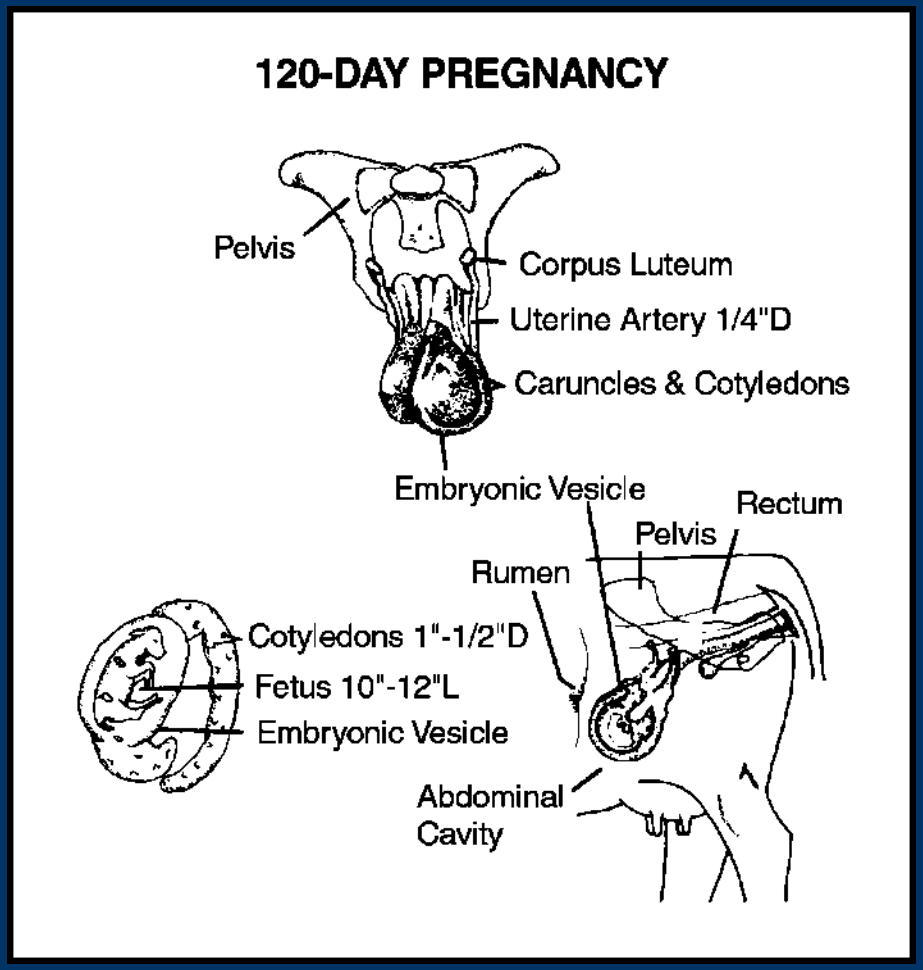
120-Day Pregnancy

The fetus in this stage is 10” to 12” long and is still on the floor of the body cavity.

The head of the fetus is nearly the size of a lemon and may be the first portion of the fetus that the palpator touches.

Because the fetus is larger in this stage, it is normally easier to locate.

Each cotyledon is 1” to 1 ½” in length and the uterine artery has increased in size (¼” in diameter).



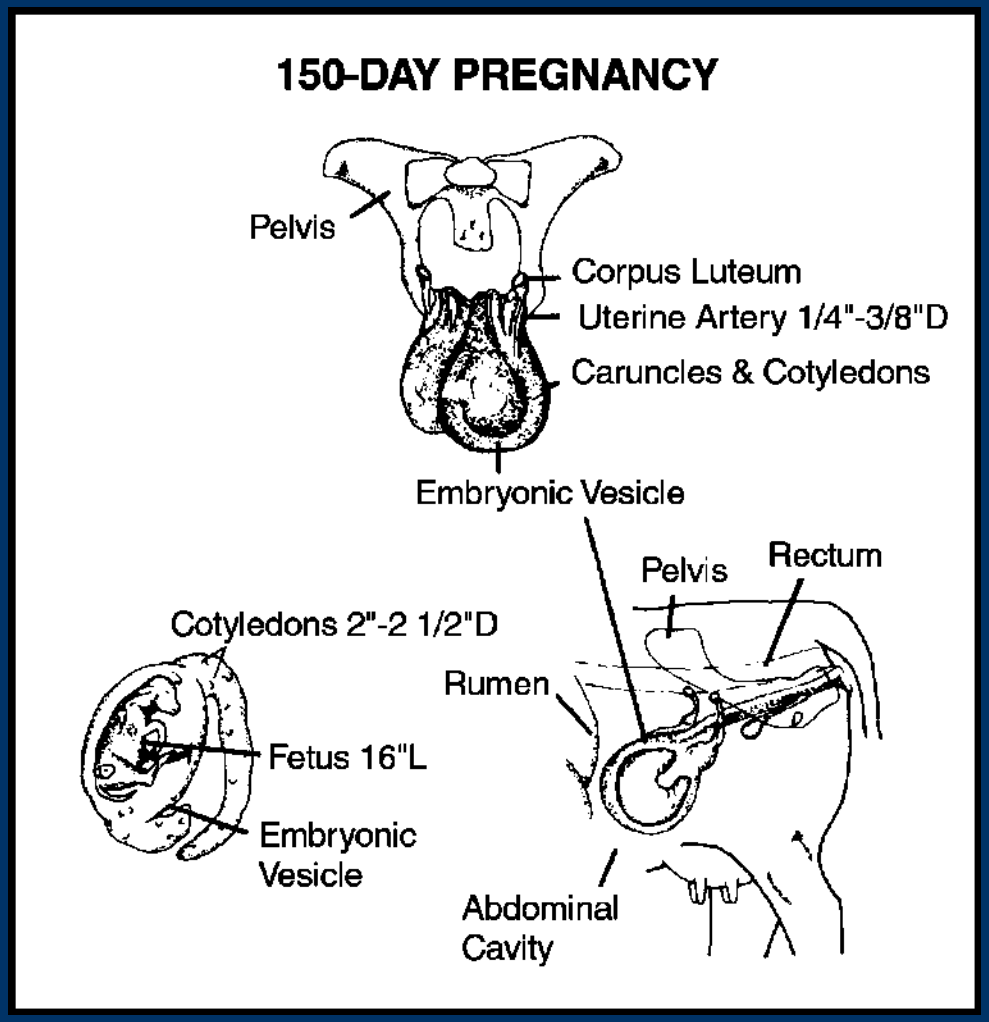
150-Day Pregnancy

The main change from this stage until birth is in the increase in the size of the fetus.

At 150 days, the fetus is the size of a large cat (approximately 16” long).

The uterine artery is ¼” to 3/8” in diameter and each cotyledon is 2” to 2 ½” in diameter.

Palpation of the fetus may still be difficult because of its low position in the body cavity.



180-Day Pregnancy

At this stage, the fetus is still deep in the body cavity.

The uterine artery is 3/8” to ½” in diameter and the cotyledons are larger.

From 180 days until birth, the fetus can be made to move by grasping its feet, legs, or nose.

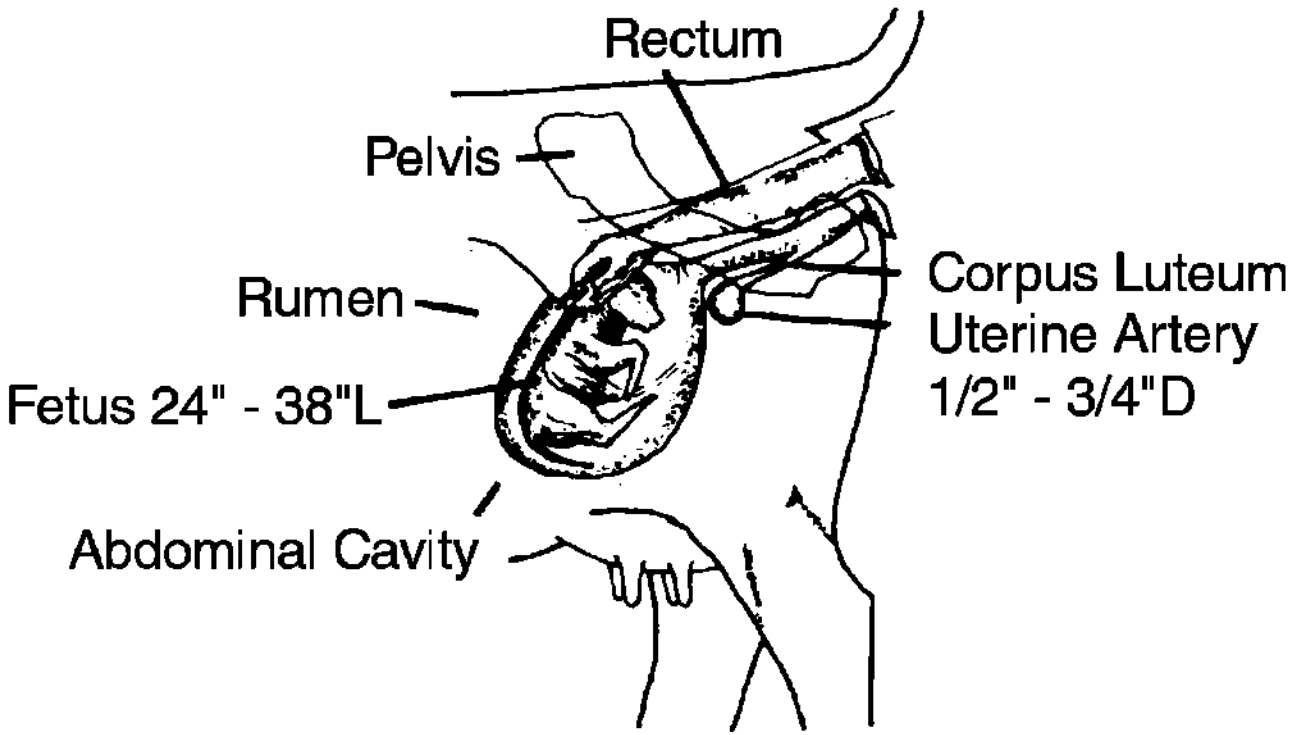
Seven-Month and Longer Pregnancy

At 210 days of age, the fetus is 24” to 38” long.

The uterine artery is ½” to ¾” in diameter.

From seven months until calving, the fetus may be easily felt because of its increasing size.

210-DAY PREGNANCY
(Fetus May Be Felt)



Other Methods of Pregnancy Diagnosis

In addition to rectal palpation, other methods may be used to detect pregnancy in cows, including:

- Ultra sound, and
- Biochemical tests.

Ultrasound

Detection of pregnancy through the use of ultrasound may be beneficial during the later stages of pregnancy (day 30 or later).

Organs of the reproductive tract, as well as a developing fetus, can be viewed using ultrasound technology.

Photo by Peggy Greb courtesy of USDA Agricultural Research Service.

When using ultrasound, a probe is passed over the cow’s abdominal wall or into the rectum to transmit two-dimensional images to a monitor that can be viewed by a technician.

Biochemical Tests

On-farm test kits are available to producers to pregnancy-check their cows.

Some kits are easy to use and give the producer immediate results.

One example of a test kit is a milk progesterone test, which allows a producer to test the level of progesterone in a milk sample.

A color change in the sample indicates the pregnant or non-pregnant status of a cow.

Summary

Pregnancy diagnosis by palpation is an important tool to measure the success of reproductive management of a cattle herd.

Determining pregnancy in cattle by palpation is not particularly difficult, but it requires experience, practice, and a thorough knowledge of the cow's reproductive system to determine the stages of gestation at 30-day intervals.

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