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# Lecture title: Pregnancy diagnosis (cyesiogenosis)

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**Summary:**

- The main purpose of pregnancy diagnosis in animals is economy of the farm. (Culling sterile animals, evaluation fertility of the herd, determine the proper care, treatments, and feed according for pregnant animals, protection and increasing endangered animals.
- Three methods for pregnancy diagnosis are available, Visual, Clinical, and Laboratory.



1- Visual Methods

- Non return to estrus

After mating and doesn't return to estrus again, the owner thinks that the animals has pregnant.

- Abdominal size.
- Fetus motility.

2- Clinical Methods

2.1. Rectal palpation.
2.2. Vaginal examination.
2.3. Abdominal ballottement.
2.4. Ultrasonography.
2.5. Radiography.

2.1. Rectal palpation.

- Examination of ovary, uterus and vagina.
- Trans rectal palpation widely used, oldest, cheapest and faster method.
- It is suitable for early pregnancy diagnosis in cattle.
- Use in most large animals (Cattle, Buffaloes, Mares, Camels and large size pigs).
- We don't have any information about viability of fetus during earlies stage of pregnancy.
- We can start diagnosis pregnancy from 30 days after conception in cows.
- No special equipment and give the result immediately.
- Need clinical experience from a veterinarian.
- Not suitable for diagnosis of twin, assessment of fetal viability and sex.
- The examination can be done by wearing cloves put on hand with sterile paraffin and insert hand into the rectum for palpation ovary, and uterus through rectal wall.



2.2. Vaginal examination.

- The wall of vagina looks drier.
- The cervix become closed with a plug of thick mucus in cattle and mare.
- Uterine artery can palpate via vagina in ewes after 50 days of pregnancy by using 1 to 2 fingers.

2.3. Abdominal ballottement.

- Palpation of the abdomen to detect excessive amounts of fluid.
- Using in ewe.
- Keeping ewe in standing position, if the animal is pregnant the fetus is felt to drop on the palpating hand.
- Good to use after 80 days of gestation.



2.4.Ultrasonography.

- Radiologic technique to visualize deep structures of the body are by recording the reflections of ultrasonic waves directed into the tissues.
- Human ear audible sounds vary between 20 to 20,000 Hertz (Hz), while ultrasound waves are of frequency higher than this( 1-10 MHz) are used.
- Transmission is poor in space and gas.
- Reflection of wave depend on the density of substance.
- Useful for diagnosis fetal size, maturity, twins, fetal viability, sex, age, uterine tumors, abscesses and ect .

The most important parameters describing the wave are:

- Wavelength
- Frequency
- Velocity

- Intensity

The most important transducers are:

- **Linear probe**

The liner arrangement of piezoelectric , frequency in 2 D is 2.5Mhz – 12Mhz and 3D is 7.5Mhz – 11Mhz. .

Use for

Vascular examination

Venipuncture

blood vessel visualization

Breast

Thyroid

Tendon

arthrogenous

Intraoperative

laparoscopy



- **Convex probe**

The piezoelectric crystal arrangement is curvilinear, frequency in 2 D is 2.5Mhz – 7.5 Mhz and 3D is 3.5Mhz – 6.5 Mhz. .

Use For

- Abdominal examinations
- Transvaginal and transrectal examinations
- Diagnosis of organs

- **Pencil transducers**

Doppler probes, measure blood flow and speed of sound in blood, frequency 2Mhz– 8Mhz.

- **Phased Array Transducers**

The piezoelectric crystal arrangement which is called phased-array,

frequency is 2Mhz – 7.5Mhz

## Endocavitary Transducers

- Four different modes of ultrasound are used in medical imaging

1- A-mode: the simplest type of ultrasound. A single transducer scans a line through the body with the echoes plotted on screen as a function of depth.

2- B-mode: a linear array of transducers simultaneously scans a plane through the body that can be viewed as a two-dimensional image on screen.

3- M-mode: scan motion. rapid sequence of B-mode scans whose images follow each other in sequence on screen enables to see and measure range of motion.

4- Doppler mode: measuring and visualizing blood flow. Assess whether structures (usually blood) are moving towards or away from the probe, and its relative velocity.

## Ultrasound machine parts:

1- Transducer probe (send and receive waves).
2- Central processing unit (CPU)- computer part does all calculations and control the electrical power for it and probe.
3- Display- to show the image.
4- Keyboard – to inputs data and doing measurements.

5- Storage device- to storage the images, and movies (CD, hard and floppy).
6- Printer – to print the image.

## Disadvantages of ultrasound:

1. More expensive than other methods.
2. Need training to accurately and efficiently.

## Transrectal ultrasonography ultrasonography

- Possible to use in large animals.
- Most common use in first 3 months of gestation.



## Trans-abdominal (Transcutaneous) ultrasonography

- Use in small animals.
- Most common use from the 3rd month of gestation.

2.5.Radiography

- Limited used for pregnancy diagnosis in the small ruminants (sheep and goat), (dog and cat) and rarely in pigs.
- Good for evaluation fetal numbers in dog and cats and poor in studding viability.
- Expensive and need special room and equipment.

- Can diagnosis pregnancy in sheep and goat from day 70 of gestation, 23-25 days in dog,

## References:

1- Aladin, C., Fahrudin, S., Dzelaludin, J. 2011. Application of Ultrasound in Medicine. AIM;19 (3):168-171.
2- Jedrej, m. J., Michal, K., Jakub, K., Bartlominj, M., Jaskowski, Magdalena, H., Marek, G. 2019. Rectal palpation for pregnancy checks in cows – the past or an alternative to modern diagnostic methods. Medycyna Weterynaryjna 75(01):6156-2019.
3- Govind, P. 2010. Methods Of Pregnancy Diagnosis In Domestic Animals: The Current Status