

Methods of Pregnancy Diagnosis in Sheep and Goats

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Introduction

Sheep and Goats are important species of livestock for India. They contribute greatly agrarian economy, especially in rural areas and play important role in livelihood of small and landless labourers. They have short reproductive cycles (short lambing/kidding interval) and high incidence of multiple birth. So, in economic point of view it is need for early detection of pregnancy to avoid heavy losses in milk and lamb production. It also essential for providing information about conception rates after artificial insemination, gestational course, time for drying-off and for parturition date. Early pregnancy diagnosis improves reproductive performance in herds and achieving high economic efficiency. The various methods have been used for pregnancy diagnosis in sheep and goat include physical methods (no return to oestrus, live weight monitoring, udder evaluation and milk secretion initiation etc.) clinical methods (Ultrasonography, Radiography etc.) and laboratory methods (Hormonal assays). The choice of method depends on the species, stage of gestation, availability of equipment, cost, accuracy and speed of diagnosis.

Physical Methods

- 1. Nonreturn to oestrus:** - This is oldest and commonly used methods for pregnancy detection in small ruminants. Non-return to oestrus is not expensive, practical method.
- 2. Live weight monitoring:** - The live body weight of sheep and goat increase during pregnancy. Weighing the goat before breeding and at third or fourth month of gestation. This is not reliable method.
- 3. Udder evaluation and Milk secretion initiation:** - The udder development and the appearance of colostrum is also used for diagnosis of pregnancy. The changes in udder consistency and its enlargement are an accurate and practical method for pregnancy detection but only by its end. Webb (1942) examined that ewes carrying

their first lambs produce a sticky honey like mammary secretion after the third month of gestation and multiparous ewes produced a waterier secretion.

4. **Abdominal palpation and ballottement:** - This method can be used for diagnosis during late stages of pregnancy in ewes and does. The inspection of the abdominal region, transabdominal palpation of uterus and foetuses by placing a hand on either side of the abdomen and squeezing or lifting upwards, the gravid uterus or foetus can sometimes be palpated through the relaxed abdominal wall. A foetus can be sometimes be balloted low in the right flank during the last month of gestation. Easier examination when feed and water are withheld for at least 12 hrs. before.

Clinical Methods

1. Ultrasonography

Most popular method which provides a non-invasive and rapid means of pregnancy diagnosis as well as estimating fetal numbers and viability in sheep and goats. Used for diagnostic imaging of the various organs of the body including reproductive organs. In Ultrasonic we are using high frequency (1-10 MHz) sound wave for diagnosis. Three types of ultrasonographical *viz.* amplitude-depth (A-scan), Doppler and Real time B-scan ultrasonics can be used to detect pregnancy in ewes and does under field conditions.

- a. **A-Scan ultrasonic techniques**– This technique based on principles, Echo amplitude or amplitude depth versus time. Diagnosis is based on detection of fluid filled uterus. This units are sensitive at a depth of 10 to 20 cm.
- b. **Doppler ultrasonic**– Detecting the movements as an indication of pregnancy such as fetal heartbeat, fetal circulation and fetal movement.
- c. **B-Scan ultrasonic techniques** – Most accurate, rapid and safe method of pregnancy detection and determining fetal numbers. Real time ultrasonography produces two-dimensional image on a screen which can be photographed by a Polaroid camera. In goats, the transabdominal and transrectal approaches are most frequently used.

2. Radiography

The radiography is imaging method to detect pregnancy and number of fetuses in ewes and does. By using this method pregnancy detection may be done at 58 days after insemination in goats. (Barker and Caw-lay. 967). After 65 days foetal skeleton is

mineralised and could be visualized. Under field conditions, this technique is not applicable because of large number of ewes and does.

Laboratory Methods

1. Vagina biopsy

Vaginal biopsy is depending on changes occurring in layers of vaginal epithelium cells during the pregnancy. In pregnant ewes, vaginal mucosal cells and nuclei are half of the size than those in non-pregnant animal, which have polygonal and squamous cells in more than 10 layers. Pregnant ewe's vaginal epithelium has few layers of columnar, cuboidal and prismoidal cells. For biopsy samples must be taken from the anterior vagina.

2. Palpation of uterus via laparotomy

The gravid uterus can be palpated directly through a small in the abdominal wall. Distended uterine horns appear after 4-5 weeks of mating. After 6 weeks of mating cotyledons become obvious and the horns are 5-10 cm in diameter. Cranial to the udder a small ventral paramedian incision is made large enough to permit entrance of 2-3 fingers. An enlarged thin-walled uterus containing fluid is taken as indication of pregnancy. (Lone *et al.* 2016).

3. Hormonal assays

Measuring steroid hormone concentrations such as estrone sulphate, progesterone at specific times after insemination/ mating is aid in pregnancy detection in small ruminants. Different methods are used for analysis of blood, milk and faecal progesterone concentrations for evaluation of their endocrine status such as immunoenzymatic (ELISA), immune chemiluminescence analysis and Radioimmune. Estrone sulphate is produced by the fetoplacental unit in sheep and goat. Its presence in plasma or in milk is indication of pregnancy.

4. Analysis of pregnancy associated proteins

The pregnancy diagnosis in goats done by immunological analysis of some specific proteins such as the early pregnancy factors. By using Radioimmunological (RIA) or immunoenzymatically (ELISA) techniques we detect specific antigens using monoclonal or polyclonal antibodies. The presence of pregnancy associated glycoproteins in blood plasma or in milk samples is reliable methods for early pregnancy diagnosis.

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