

AN-ACM-257

Diagnosis of Heat and Pregnancy in Cows

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Audiotutorial Module



International Livestock Research Institute

A

Foreword

ILRI offers training to animal scientists in Africa, Asia and Latin America in different areas of livestock research, production and utilisation. Since the number of scientists that need this training is large, ILRI produces material that facilitates self-learning. Self-instructional audio-tutorial modules form part of this material. Each module consists of an audio-tape, a set of slides and an illustrated booklet.

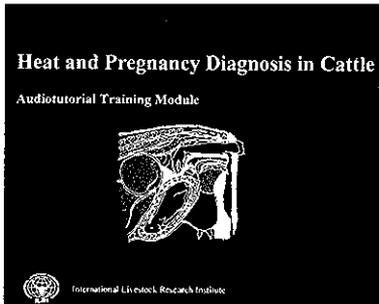
This document is the booklet for the module 'Diagnosis of heat and pregnancy in cows'. Although designed for African situations, we hope the module will also be useful for other locations and that it will be used in educational institutions.

M. Smalley
Director, Strengthening Partnership with NARS

Diagnosis of heat and pregnancy in cows

Visual

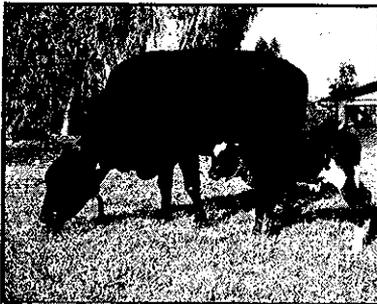
1.



Audio

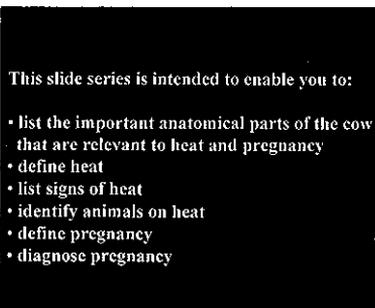
This module is produced by the International Livestock Research Institute. The module is part of a series of instructional materials on improving ruminant livestock productivity.

2.



Heat and pregnancy are major events during the reproductive cycle of a cow. Learning about these events and how to detect them will help you manage animal breeding experiments more efficiently.

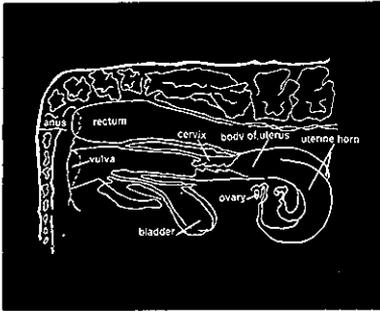
3.



This module is intended to enable you to:

- list the important anatomical parts of the cow that are relevant to heat and pregnancy detection
- define heat
- list signs of heat
- identify animals on heat
- define pregnancy
- diagnose pregnancy.

4.



Successful diagnosis of heat and pregnancy depends on your understanding of the organs involved in both processes. It is therefore important to learn about the reproductive organs that are involved in manifesting heat and sustaining pregnancy in cows.

5.



The interval between two successive heats is called the oestrus cycle. The heat period is the shortest phase of this cycle. To observe as many episodes of heat as possible, cows should be observed carefully and often, especially in the morning and late afternoon. The best results are achieved when you know what to look for or when many individuals work as a team.

6.



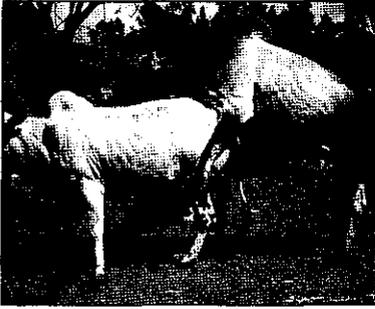
The behaviour of cows can be used to detect heat. Cows that are restless and noisy may be on heat.

7.



The surest sign of heat is when the cow or heifer permits other animals to mount her while she remains standing. This is known as standing heat.

8.



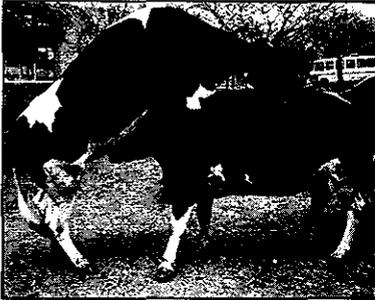
If there is a bull present in the herd, it may mount a cow on heat. A vasectomised bull (known as a teaser bull) can therefore be used to detect heat. The bull mounts the cow on heat but fertilisation does not occur.

9.



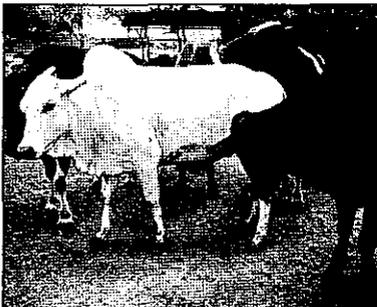
Mounting ruffles or even removes the hair on the tail head and on either side of the flank. The skin on either side of the tail is often scarred and dirty. Ruffled hair on the rump of a cow may be a sign that the cow is on heat.

10.



A cow on heat may mount other cows from the front.

11.



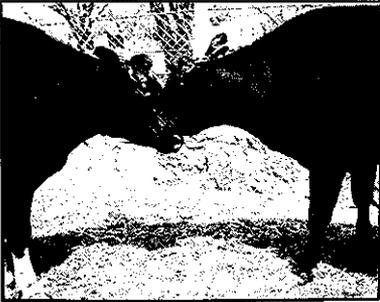
Besides attempting to ride other females, a cow on heat may follow them. It may also stand beside them.

12.



A cow on heat may put her head on the backs or rumps of other cows.

13.



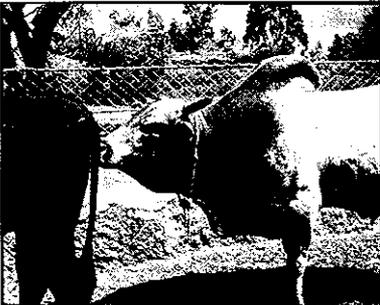
When you see a cow nudging and butting other cows, suspect heat.

14.



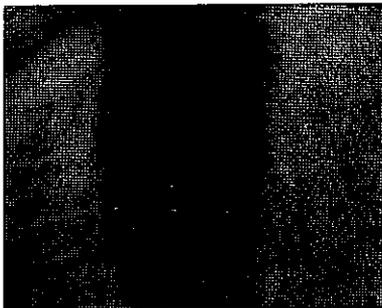
Sometimes cows on heat will sniff other cows.

15.



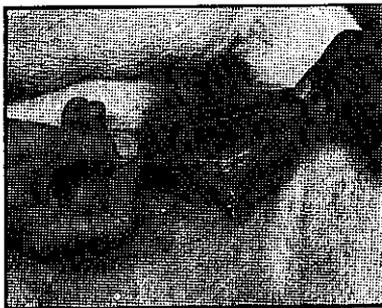
Bulls also sniff cows on heat.

16.



In cows on heat the vulva lips are moist, slightly swollen and pink. Hormonal changes associated with heat cause an increase in blood supply to the reproductive organs. This in turn causes swelling and reddening of the vulva.

17.



The skin of the vulva turns pink because of increased blood flow through the fine network of blood vessels that runs under the mucous membrane.

18.



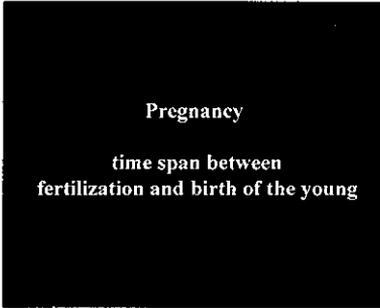
Mucus hanging in strings from the vulva indicates that a cow has been on heat. The mucus, which looks like egg white, originates in the uterus. When you see mucus, the cow is at the end of its heat cycle. Such a cow should not be used for breeding.

19.



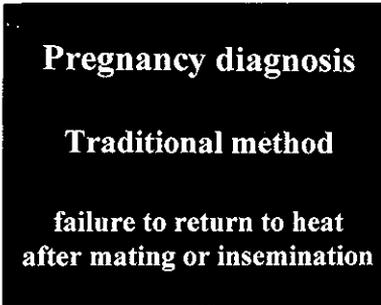
Artificial methods can be used to help us detect onset of heat in cattle. A simple method is to release a teaser bull among cows.

20.



When a farmer detects a cow on heat, he or she introduces a fertile bull to the herd or calls an artificial insemination technician. This may lead to pregnancy. To successfully manage cattle fertility, you must be able to diagnose whether pregnancy has occurred or not. You need this information to manage breeding of the herd.

21.



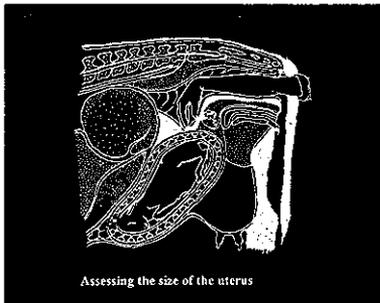
Methods to diagnose pregnancy should be accurate, inexpensive and easy to perform. Traditionally farmers declare a cow pregnant when it fails to return to oestrus cycle or heat.

22.



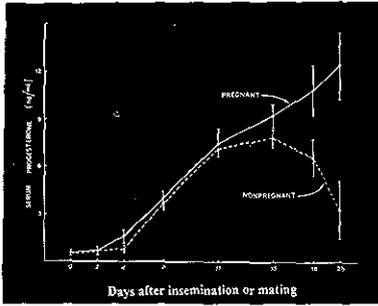
In the field, palpation is the most reliable method to diagnose pregnancy. In this method you insert your hand via the rectum and gently palpate the ovaries and the uterus. Rough handling in the early stages of pregnancy may lead to abortion. Palpation is therefore best done by a veterinary surgeon or trained technician.

23.



A veterinary surgeon uses the palpation method to detect swelling of the uterus and ovary, the presence of foetal contents and enlarged uterine arteries. This method is difficult and the results of the diagnosis are not reliable during early stages of pregnancy.

24.



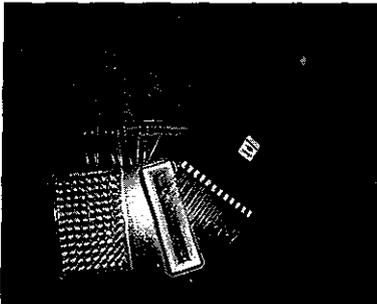
A simpler method for diagnosing pregnancy is to analyse progesterone in the blood or milk. The basis of diagnosis is the expected and sustained increase in progesterone when an animal conceives and maintains a corpus luteum on her ovaries. Progesterone is essential to maintain pregnancy

25.



Blood sampling is usually recommended on day 20 or 21 after mating or insemination. It involves simple jugular collection of approximately 10 ml taken from the distended neck vein with a needle and glass vacuum tube.

26.



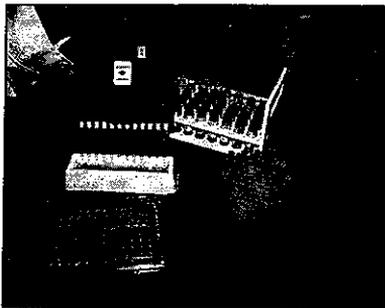
Plasma progesterone concentration can be estimated by the enzyme-linked immunosorbent assay (ELISA) technique using test kits.

27.



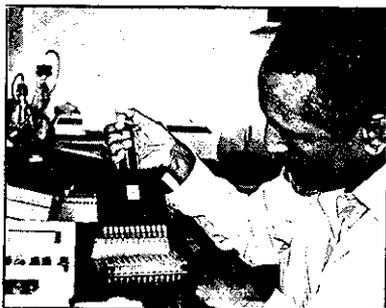
Add 10 μl of four undiluted standards to the appropriate wells on the microtitre plates, then add all samples to the remaining wells.

28.



Add 200 μ l of progesterone-alkaline phosphatase to each well, cover the plate with aluminum foil and leave to stand at room temperature for 30 minutes. After this incubation, empty the plate and wash twice with cold water.

29.



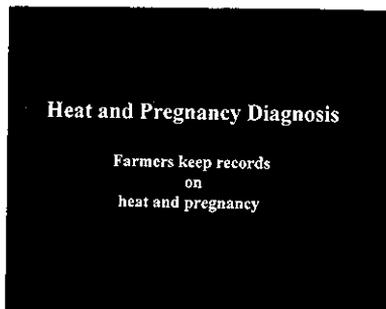
Add 200 μ l of p-nitrohenyl phosphate to each well and incubate the plate again at room temperature. After this incubation, add 100 μ l of stopping solution to all wells.

30.



Read the plate at 405 nm using a spectrophotometer or plate reader. Calibrate the zero in the instrument with air. Then plot the results of the standard and interpolate progesterone values in the samples.

31.



Records of dates of heat period and pregnancy checks must be kept so that reproductive data can be interpreted.

Self-Test

1. What is the single, surest sign of heat in a cow?
2. List three behavioural signs that may be exhibited by a cow on heat.
3. List two anatomical changes that you may observe to detect heat in a cow.
4. Describe one artificial method to detect heat.
5. How do farmers traditionally detect pregnancy in cows?
6. Palpation is a reliable method to detect pregnancy in cows. Why must palpation be done by a veterinary surgeon or experienced technician?
7. When do we analyse blood for progesterone to determine pregnancy in cows?

Answers to the self test

1. The cow or heifer that permits other animals to mount her while she remains standing.
2. A. The cow mounts other cows.
B. The cow sniffs other cows.
C. The cow is restless and noisy.
3. A. Mucous on the vulva.
B. Vulva is swollen and pink.
4. Release of vasectomised bulls (known also as teaser bulls) among cows.
5. The traditional method of determining pregnancy in cows is failure of mated or inseminated animals to return to oestrus.
6. Palpation is delicate and rough handling in the early stages of pregnancy may lead to abortion.
7. Blood sampling is usually recommended on day 20 or 21 after mating or insemination.

Suggested reading

- Mukasa-Mugerwa E., Zere Ezaz and Viviani P. 1990. Plasma concentrations of progesterone during oestrus cycles of Ethiopian Menz sheep using enzyme immunoassay. *Small Ruminant Research* 3:57–62.
- Mukasa-Mugerwa E., Tegegne A. and Franceschini R. 1991. Influence of suckling and continuous cow–calf association on the resumption of post-partum ovarian function in *Bos indicus* cows monitored by plasma progesterone profiles. *Reproduction, Nutrition, Development* 31(3):241–247.
- Payne W.J.A. 1990. *An Introduction to Animal Husbandry in the Tropics*. Longman Scientific and Technical, New York, USA. 881 pp.

Acknowledgements

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