Management of the dairy cow from onset of heat to conception

Commercial dairy farmer training program

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Objectives

- By the end of this lesson, participants must be able to:

1. Define heat
2. Identify a cow which is on heat
3. State the importance of heat detection
4. Define conception and conception rate
5. State merits and demerits of natural mating and artificial insemination in dairy animals
6. State factors affecting conception rates in dairy animals

Introduction

- Heat detection is the start up point in in determining economic returns in reference to the dairy industry.
- Dairying is one the most important industries in the agricultural sector in that at farm level it provides employment and nutrition.
- It also provides raw milk to the dairy processing industry e.g. Dairiboard Zimbabwe Limited.

What is “heat”?

- Heat is a period of acceptance for mating (sexual receptivity), due to ovulation, that normally occurs in non-pregnant, pubescent heifers and non-pregnant cows.
- This period of receptivity may last from 6 to 30 hours and occurs every 21 days on the average.
- However, the interval between two heats may vary normally from 18 to 24 days.

Signs of heat

- Detection of heat calls for acute observation.
- Most cows have a pattern of behaviour that changes gradually from the beginning to the end of a heat.
- The best indicator that a cow is in heat is when she stands and allows herself to be mounted by herd mates or a bull.
- A series of signs that may help to identify cows that need to be observed closely are summarized in Table below.

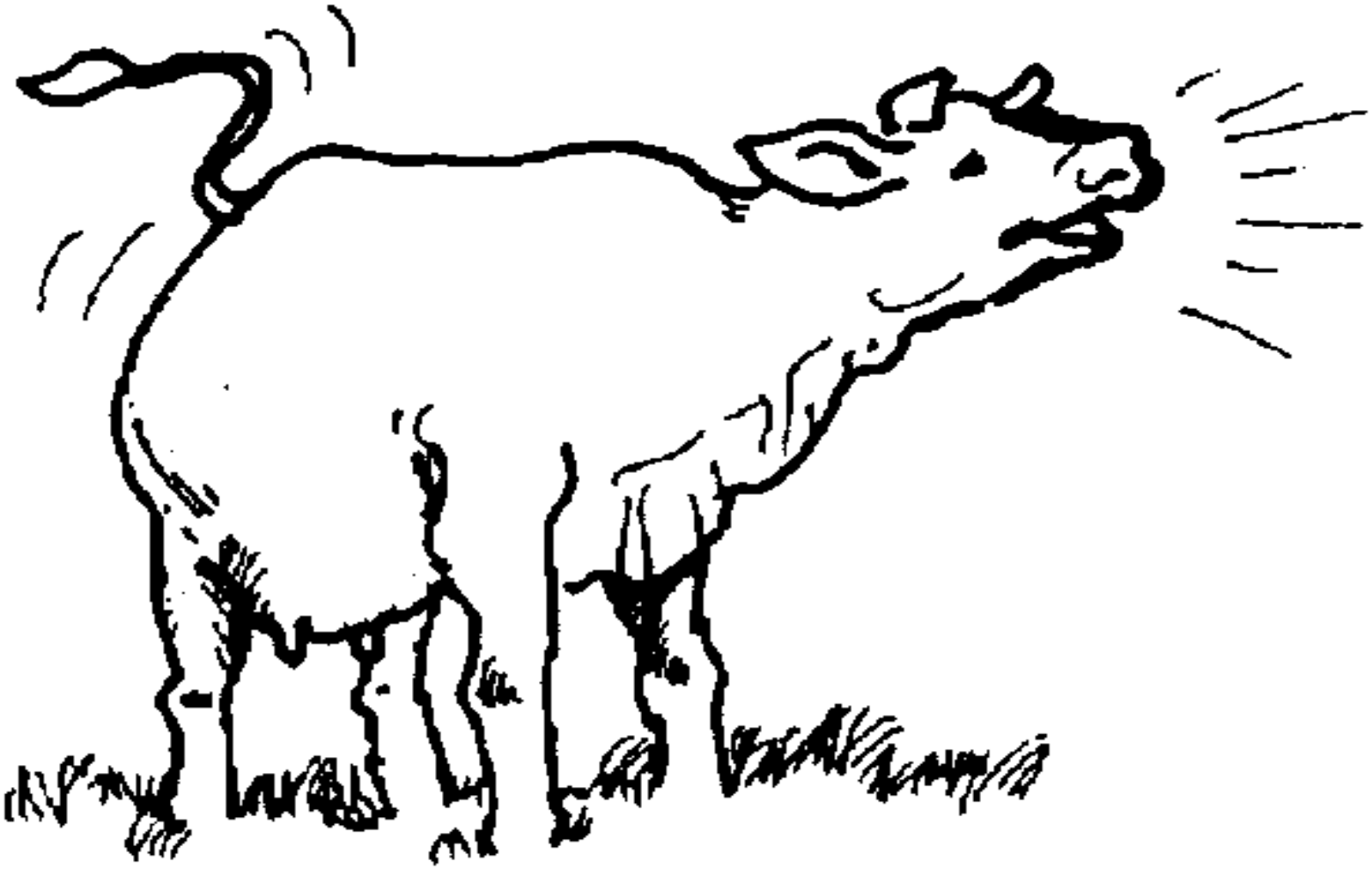
Table 1: Signs of estrus in dairy cows

STANDING HEAT
• Stands immobile when mounted. • Displays signs associated with early and late heat.
EARLY AND LATE HEAT
• Bellows like a bull. • Displays general signs of nervousness. • Rushes forward as if attacking; head-to-head position with another cow is frequently seen. • Butts or pushes against the sides of other cows. • Sniffs the vulva or urine of other animals; this is sometimes followed by inversion of the nostrils. • Cows circle each other, the one in heat attempting to rest her chin on the back of the other; this may or may not lead to mounting activity. • Pink and swollen vulva and clear mucous discharge are visible.
INCIDENTAL SIGNS[1]
• Depressed appetite and milk yield. • Dirty animal (manure on flanks). • Tailhead has roughened appearance with possible hair loss.

[1] Non-specific signs whose occurrence depends on a particular situation

Standing, mounting, allowing herd mates to mount

Bellowing and restlessness

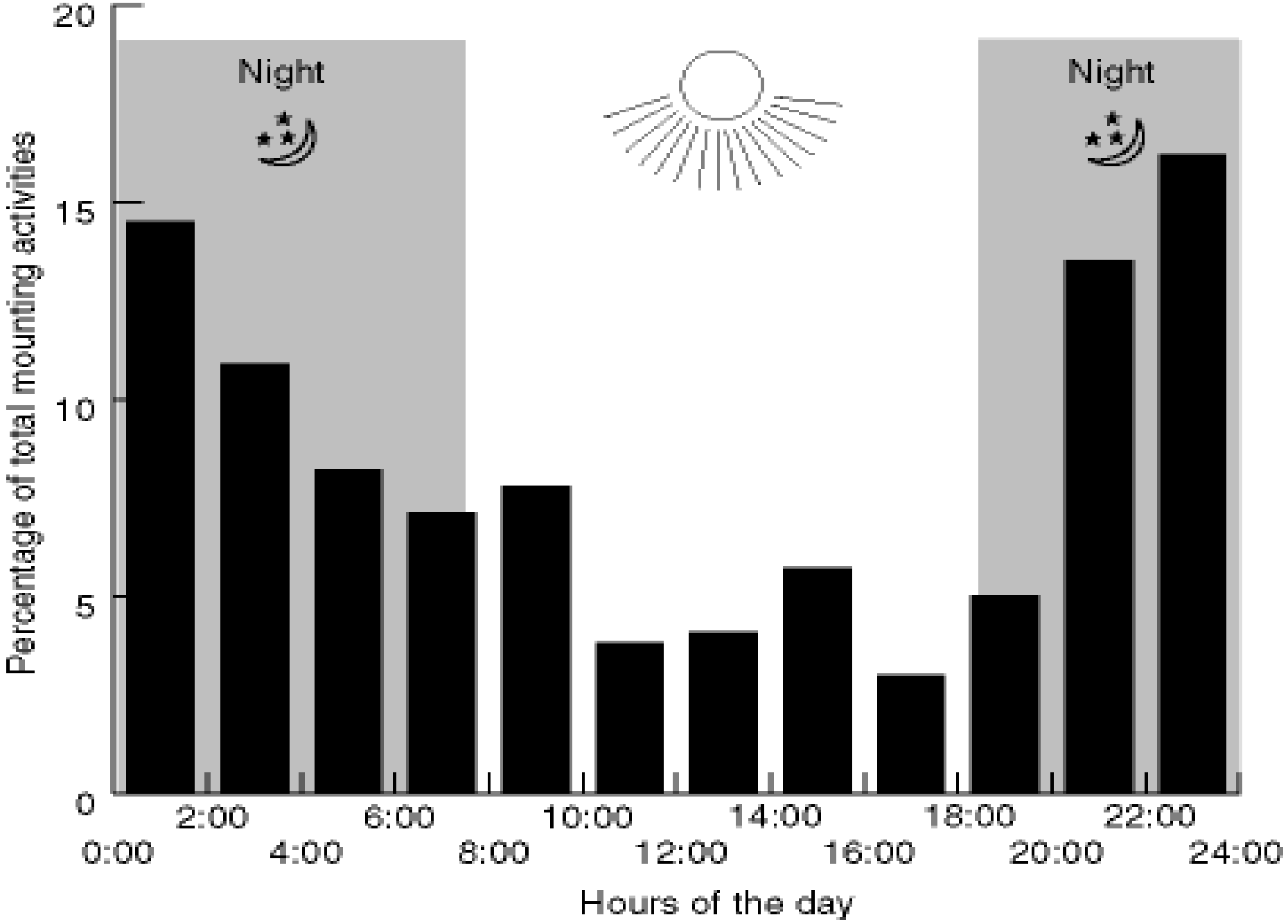


Pink and swollen vulva, clear mucus-like discharges


Getting Bored...
Sniffing & Interested
Standing

Daily patterns in signs of heat

- The onset of heat activity follows a distinct pattern, with most activity occurring in the late evening, through the night, and in the early hours of the morning.
- Research shows that more than 70% of mounting activity takes place between 7:00 at night and 7:00 in the morning (refer to figure below).
- In order to detect more than 90% of the heats in a herd, cows should be observed carefully in the early hours of the morning, the late hours of the evening, and at four- to five-hour intervals during the day.


Night
Night
20
15
10
5
0
Percentage of total mounting activities
2:00
6:00
10:00
14:00
18:00
22:00
0:00
4:00
8:00
12:00
16:00
20:00
24:00
Hours of the day

Absence of heat

- Heat may not be detected in cows for the following reasons:

1. The cow is pregnant.
2. The cow has calved and the heat cycle has not yet resumed (silent heat).
3. The cow is anoestrus because of poor nutrition, severe infection of the reproductive tract, or other complications after calving.
4. The cow has cystic ovarian disease (exhibits nymphomania).
5. The stockman fails to detect a cow that actually came in heat.

Factors contributing to poor heat detection

- Oestrous cycle length→ 18- 24 days (average 21 days).
- Duration of oestrus (heat) averages 15hrs (ranges from 2-30hrs).
- Duration of “stand” ≈ 4- 6 seconds.
- There is a wide range in number of total ‘stands’
- Total standing time is very short in relation to entire period of oestrus.

Mating/Artificial insemination

- Depends on successful heat detection.
- Poor heat detection is the biggest problem in reproductive management in dairy herds.
- Research shows that as much as 50% of heats go undetected.

Insemination

1. Natural insemination
2. Artificial insemination

Natural insemination/mating

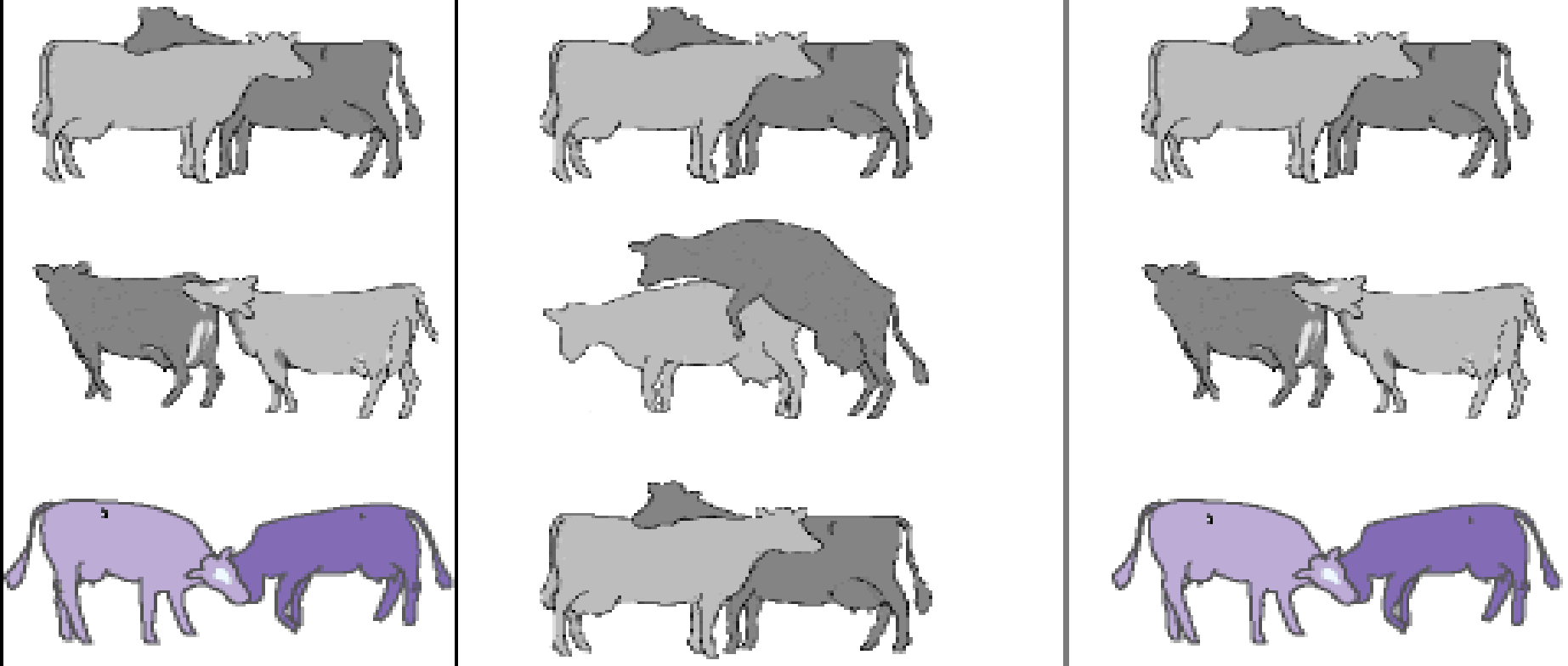
- The use of bulls for natural service remains widespread even in areas where artificial insemination has proven to be very effective.
- Many farmers believe that pregnancy rates are higher when a bull is used than when artificial insemination is used.
- However, when heat detection is accurate and the insemination is properly performed, artificial insemination and natural service give similar breeding success

Artificial insemination

- Artificial insemination is a technique by which semen is introduced artificially into the body of the uterus at the time of heat in an attempt to cause pregnancy.

When to inseminate

Coming into heat	Standing heat	Going off heat
8 hours (0-24 h)	16 hours (3-30 h)	8 hours (2-24 h)



0 6 12 18 24 Hours

Artificial Insemination:	Too Early	Good	Best	Good	Too Late
Natural Mating:	Too Early	Best		Too Late	

Activity

- State advantages and disadvantages for both natural insemination and artificial insemination

What is conception?

- Conception is the moment when the egg (ovum) and sperm meet subsequently bringing about fertilization and implantation.
- Conception rate is calculated by dividing the number of pregnant cows by the total number of inseminations.

Causes of low conception rates

- More than 90% of the cows in a herd should require fewer than three services to conceive. Possible causes of low conception rates (less than 50%) may fall into different categories:
- **Problems related to heat detection:**
  - Not servicing a cow that is on heat
  - Servicing a cow that is not on heat
  - Improper timing of service
  - Misidentification of cows leading to errors in records
- **Problems related to natural service or artificial insemination:**
  - A bull with a low fertility
  - Improper insemination techniques
- **Cow factors:**
  - Infection of the reproductive tract
  - Hormonal disorders
  - Obstructed oviducts
  - Anatomical defects
  - Early embryonic death (cow becomes pregnant, but the pregnancy is not maintained)
- **Problems related to nutrition ??**
- **Problems related to vaccine and drug administration**

Conclusion

- Conception rates depend on successful heat detection.
- Poor heat detection is the biggest problem in reproductive management in dairy herds and this could result in significant losses.
- Research shows that as much as 50% of heats go undetected.