



# Oestrus cycle and heat detection in dairy animals in Pakistan

## Introduction

As a result of Artificial Insemination and selection of bulls and cows during the past four decades, Pakistan dairy farmers have achieved significant increases in milk production. However, compared to some countries where the average production is 6000-8000 kg per cow per year, the Pakistan average milk production is much lower. A key factor in improving milk production (after improved feeding) is timely reproduction. Each oestrus which has not been identified beyond 90 days after the last calving causes economic losses:

- in production of milk
- additional feed
- cost for labour
- loss of animals for replacement

## The heat cycle

**What is heat?** Heat is a period of acceptance for mating that normally occurs in pubescent heifers and non-pregnant cows. The period of receptivity may last from 6 to 30 hours and occurs on an average every 21 days (18-24 days).

### Phase 1. Pro-heat – before the oestrus

This phase lasts one or two days, and its characteristics are development and growth of follicles on ovaries, producing small quantities of hormones. Concentration of hormones will determine behaviour of animals: the cow is restless, it moo's, and there is a clear, transparent excretion of oestrus mucus from the vulva.

### Phase 2. Heat peak or oestrus

With maturing of so-called 'dominant' follicle on ovaries, relatively high quantities of oestrogen are being produced by cells from follicle walls. The cow stands still and allows other animals to mount her; there is more mucus which is clear and transparent.

### Phase 3. After-heat and ovulation

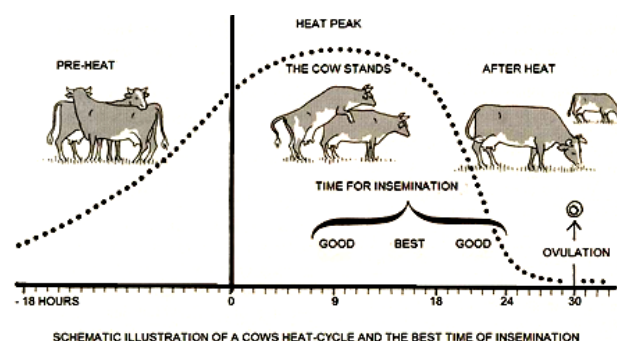
Ovulation is bursting of follicles and release of ovum. Release of ovum from follicles occurs approximately 24-30 hours after oestrus. Cows or heifers should be inseminated 12-30 hours after the beginning of oestrus.

## Identifying oestrus

Identifying oestrus, especially in larger breeding stock, is not a simple job, and it is one of the main obstacles for achieving inter-calving interval of 12 months. Facilities with cows that are to be inseminated should be visited many times, and there are also some cows that do not show obvious external symptoms of heat (so-called «silent oestrus»).

Every missed oestrus means an economic loss, because it is directly related to long service period (period from calving until the next diagnosed pregnancy), that is, to inter-calving period. Definitely, each oestrus which had not been identified, and it has been more than 100 days from the last calving, would cause economic losses in production of milk, additional feed, cost for workers, loss of animals for replacement, etc.

There could be some mucus even after oestrus. In most of the cases, this mucus contains more or less blood.



SCHEMATIC ILLUSTRATION OF A COWS HEAT-CYCLE AND THE BEST TIME OF INSEMINATION

Cow in oestrus is characterized with the so-called standing reflex. It allows other animals to mount it, and in the process, pressure in sacral area affects group of nerves (in spinal cord) which innervate also reproduction system and transmit sensitive stimuli. In that way, typical coital behaviour of cow can be detected.

## Signs of heat

Detection of heat needs careful observation. Cows have a pattern of behaviour that changes gradually from the start to the end of heat.

Onset of heat activity follows a distinct pattern, with most activity happening in the late evening, through the night, and late into the early hours of the morning. As such, in order to detect heat cows should be observed carefully in the earlier hours of the morning, and late hours in the evening.

- Characteristic signs of heat (in cattle) are:
- Standing to be mounted by other cattle
- Cow may attempt to mount others
- Vulva – reddened, swollen and moist
- Watery mucous hanging from the vulva and adhering to tail and legs
- Restless
- Bellowing
- Frequent urination
- ‘Raised tail’ is the best sign “for Heifers”
- Drop in milk production - milking animals
- Loss of appetite

Characteristic signs of heat in buffalo			
	Early heat	Mid-heat	Late Heat
	8 hrs	12–18 hrs	18–24 hrs
Urination frequency	Least	More	Less
Bellowing	Sometimes	Very common	No
Excitement	More	less	Normal
Mounting by teaser	Less	More	Least
Appetite	Normal	Less	Normal
Milk yield	Normal	Less	Normal
Cervix open	Partial	Full	Closed

## Remember!!! .... in Buffalo

Most noticeable signs of heat are shown clearly during mid-heat, so the chance of missing it is HIGH

## Time for service or insemination

Artificial insemination or natural service can lead to pregnancy only if the spermatozoa are at the right place at the right time. The egg is released from the ovary about 10 to 14 hours after the end of heat, and can survive unfertilized for 6-12 hours. While the spermatozoa can live up to 24 hours in the reproductive tract of the cow.

### Best timing of AI: The morning-evening rule

- cows observed in heat in the morning are inseminated in the afternoon
- cows observed in heat in the afternoon are inseminated the next morning

## Causes of low conception rates

- Problems related to heat detection (not servicing, improper timing)
- Problems related to AI or natural service (improper AI technique, a bull with low fertility)
- Cow factors (infections of reproductive duct, hormonal disorders, early embryonic death)
- Problems related to nutrition (poor nutrition or over feeding resulting in obesity).

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