REPRODUCTION IN BUFFALOES AND CATTLE

A Farmers' Guide to Improve Reproductive Efficiency of Buffaloes and Cattle

SAREC/NARESA Buffalo Research and Development Programme, Peradeniya, Sri Lanka

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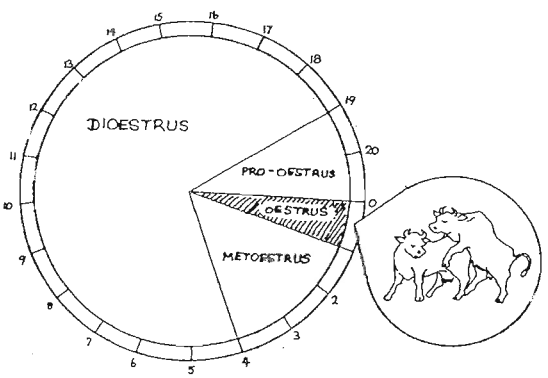
The Importance of reproduction

Both buffaloes and cattle have the potential to reach sexual maturity within 24 months of age, give birth to a healthy calf within 36 months and thereafter to produce a calf every year. This will result in optimum productivity in terms of calves and milk over the lifetime of an individual breeding female. This process is however influenced by genotype, feeding, management and climatic conditions. Scientists have found that in most situations prevailing in Sri Lanka, sexual maturity is delayed until 36 to 40 months of age and the first calving usually occurs when the animals are more than 48 months old. The inter-calving interval is also longer than the ideal interval of 12 months, sometimes as long as 24 months. This results in a direct economic loss to the farmer in terms of fewer calves and lactations per life-time of the cow.

This guide provides recommendations for managing female buffaloes and cattle for optimum reproductive efficiency.

Sexual cycle of buffaloes and cattle

Adult non-pregnant cows (buffalo and cattle) become sexually active during heat periods (or oestrus) which occurs at approximately 21 day intervals as shown Fig. 1

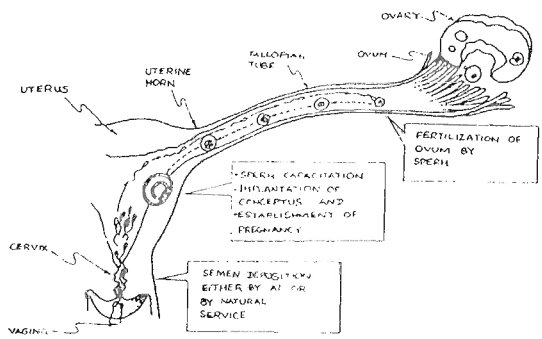


OESTRUS CYCLE (DAYS)

Fig - 01

The heat period is part of a sexual cycle of 4 phases occurring in sequence as shown in the figure. Oestrus is the only externally visible phase. The heat period usually lasts about 18 hours but it can be much shorter or longer. Males as well as other females will show interest in, and attempt to mount females in heat.

The female can get pregnant only if she is mated during or soon after the period of heat. Ovulation or shedding of the ovum from the ovary occurs about 12 hours after the end of oestrus. The sperms from the male need to spend a minimum of 6 hours in the female reproductive tract, before it acquires the capability to fertilize an ovum. The sperms can survive for 24 hours in the female tract and the ovum can remain alive for 12 hours after ovulation. Therefore, to obtain maximum fertilization rates, cows should be served within 12-18 hours after first detection of heat. Pregnancy lasts for 270 to 280 days in cattle and 300-330 days in buffaloes. This information is summarised in Fig.2



Schematic diagram of reproductive tract of buffalo and events from semendeposition to conception

Fig - 02

Heat signs of buffaloes and cattle

The changes seen during heat are brought about by a hormone called oestrogen. The heat signs as shown Fig. 3, include: (1) secretion of clear,

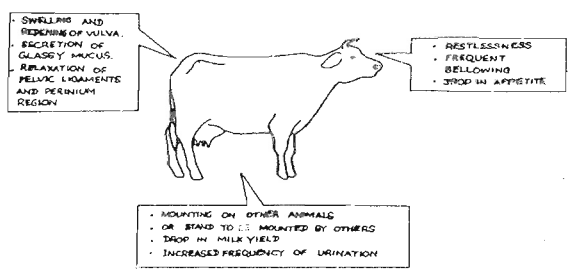


Fig - 03 Oestrous signs of cattle and buffaloes

glassy, stringy mucus from the vulva; (2) swelling and reddening of vulva; (3) relaxation of pelvic ligaments; (4) restlessness and/or bellowing; (5) decreased appetite; (6) drop in milk yield and (7) desire to interact with other animals, particularly with males.

Though cows in heat may show only one or two, or a combination, of the above mentioned signs, the best indication is that a cow in heat will allow a male or another cow to mount her. It is possible to observe this only in free grazing situations but not in housed animals. In such situations, a combination of the other signs must be used as criteria for identification of heat. Cows should be observed at least 3-4 times a day, for at least 15-20 minutes each time.

Particular attention should be paid to cows that have come into heat earlier, irrespective of whether they had been mated or not. Such animals must be observed for possible return to heat, from the 18th day after the previous heat. If they show heat signs again, they must be mated again. In the case of animals which had been previously mated, this usually means that they have not become pregnant.

In order to know which cows should be observed for heat, a record of previous heat periods of each cow must be maintained. A observed simple format for a record sheet is given in this leaflet.

What is the best time for insemination to achieve high conception rates ?

As shown in Fig.4 the best time for mating cows is-between 12-18 hours after the start of the heat period.

A practical guideline to follow:

* cows detected in heat during the morning (before noon) should be served in the afternoon of the same day.

* cows first detected in heat during the afternoon or evening should be served on the following morning.

How can you raise heifers so that they attain sexual maturity at the optimum age?

If a heifer attains puberty (onset of reproductive cycles) at an early age, she can also have her first calf early, and therefore produce more calves during her lifetime. The age at which a heifer reaches puberty is influenced by many factors, including genetic composition, nutrition and disease. The following guidelines can help you to rear heifers so that they reach sexual maturity at an early age.

1. To obtain a suitable calf to be raised as a replacement heifer, breed your cows with genetically appropriate males or semen (see Information Leaflet No. 5 in this series)

2. Ensure that the calf gets adequate amounts of colostrum within 48 hours of birth.

3. Feed the calf adequate milk, at least for the first 3 months

4. Deworm buffalo calves between day 12 and 14, and cattle calves at 1 and 3 months of age, with suitable anthelmintics (see Information Leaflet No. 6 in this series)

5. Vaccinate calves against HS, BQ and FMD if these diseases are endemic in your area (consult the Veterinary office in your area)

6. Provide adequate green grass and tree fodder starting from one month of age. During dry seasons provide supplementary feed. For calves above 3 months of age, a supplement such as Urea-Molasses-Mineral (UMM) formulations can be fed. (see Information Leaflet No. 2 in this series)

7. Provide adequate water for drinking, at least three times per day

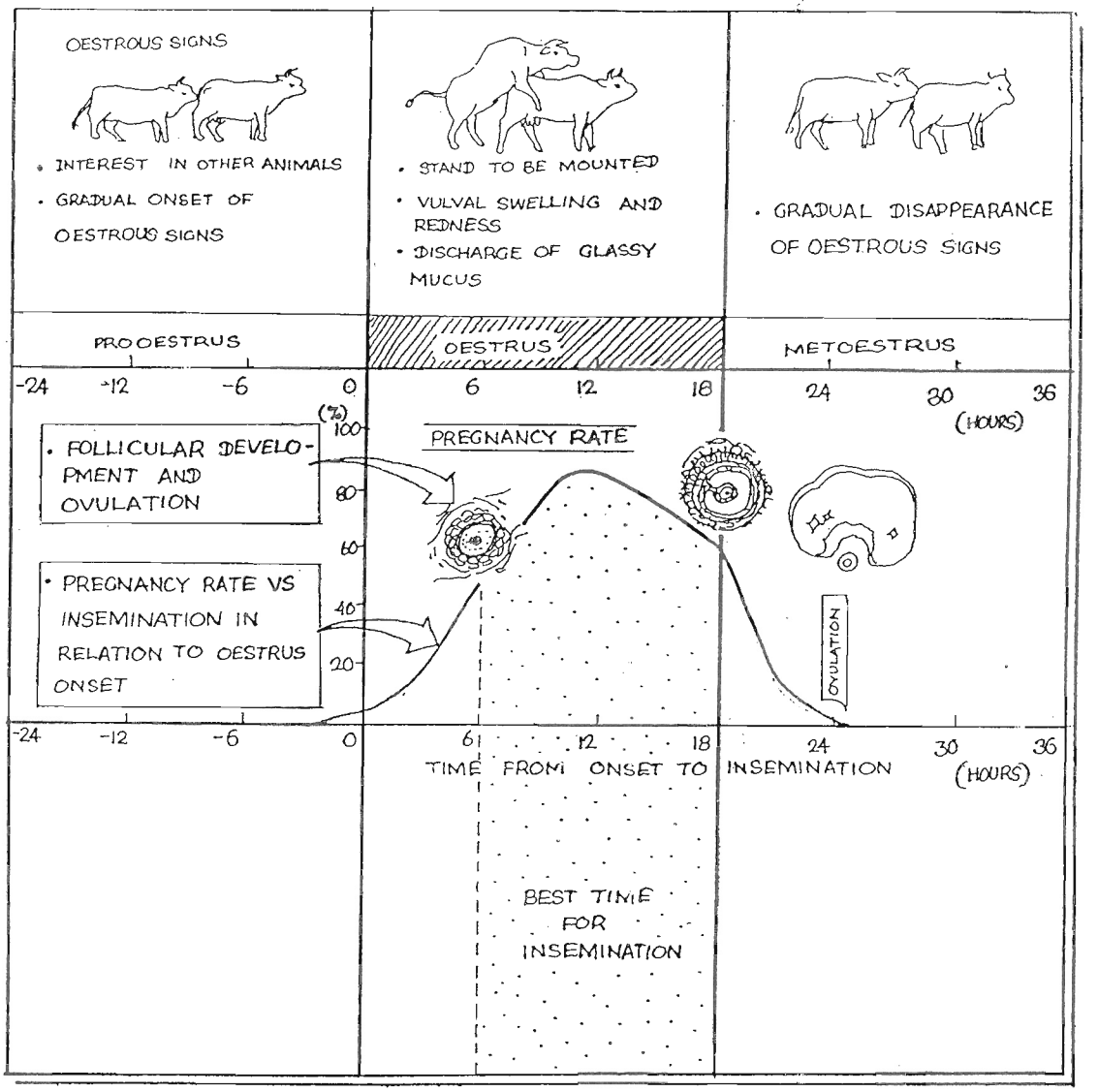


Fig - 04 : Schematic diagram showing oestrous signs, follicular development & ovulation and the relationship between time of insemination and pregnancy rate.

8. If possible, allow the growing heifer to interact with other animals, particularly with male animals, from about one year of age

9. Try to maintain a growth rate well above 300 grams/day or about 10 kg/month

Usually a heifer attains puberty as she reaches two thirds of the mature body weight. Thus a fast growth rate during the growing period will ensure that the heifer attains sexual maturity at an early age.

How can you get the first calf early ?

Buffalo and cattle heifers are capable of becoming pregnant at the very first heat period. Serving the young heifer as she commences puberty ensures early calving. However, it is important to remember that the heifer is still growing. Thus the pregnancy state demands a high plane of nutrition, for the growth of the heifer as well as her calf. The following guidelines can help you to manage heifers to ensure early calving:

1. Observe heifers for heat signs regularly according to the guidelines given earlier

2. Mate heifers as soon as they show the first heat (provided body weight is 65% of adult weight; if not, wait until this weight is reached)

3. Get the heifer served with semen from a bull of a compatible breed with high breeding value (see Information Leaflet No. 5 in this series)

4. Check the heifers from 18 days after mating for signs of return to heat and serve again if necessary

5. Provide adequate nutrition to meet the requirements of the heifer and the growing foetus.

How can you get a calf every year ?

After calving, a heifer or cow goes through a period of recovery during which the uterus returns to its normal state. The cow should normally resume sexual cyclicity within 30 to 60 days after calving. However, the process of the uterus returning to normal state can be delayed if the uterus becomes infected after calving. This can happen if the cow calves under dirty unhygienic conditions, or if she had an abnormal delivery (such as dystocia, retained placenta or prolapse of uterus). The commencement of ovarian activity and sexual cycles can also be delayed if the cow is not fed well during the period before and after calving.

Pregnant cows should be dried off two months before the expected calving date. You should dry off buffaloes at 8 months after conception, and cattle after 7 months. Cows should be fed well during the dry period so that they accumulate body reserves which will be used to produce milk during the early lactation.

This will minimize loss of body weight and condition after calving, and the animals will then be able to resume sexual cycles early after calving. Guidelines for assessing the body condition score (BCS) of buffaloes and cattle, and for using this score to ensure adequate feeding for optimum production and reproduction are given in Information Leaflet No. 3 in this series.

In order to get a calf every year the cow must return to heat within 60 days after calving and conceive within 85 days after calving. If the first heat occurs earlier than 45 days after calving, it is advisable to skip this heat and serve the cow at the next (second) heat.

Under normal conditions, only about 40-60 percent of cows will become pregnant after the first mating. Therefore, a cow that is mated must be checked for a return to heat from day 18 after the previous service and mated again if heat occurs. If the cow has not returned to heat, it is necessary to have her examined by a veterinarian for pregnancy, about 60 days after service. This will prevent loss of time and income which may result by assuming that a cow is pregnant and finding out much later that she is not.

When should you seek veterinary assistance?

In the same way that a motor vehicle needs regular check-up and servicing, dairy animals need regular veterinary examinations. To maintain your animals at the optimum level of efficiency, consult your veterinary surgeon without delay (Fig. 5) if;

1. A heifer does not reach puberty by 36-40 months

2. A heifer/cow fails to return to heat by 60 days after calving

3. A heifer/cow does not conceive after more than 3 repeated services

4. A heifer/cow has an abnormal vulval discharge, difficult calving, retained placenta or other reproductive disorders.

Fig - 05
Meet your veterinary surgeon and seek his advice and professional assistance.

What records should be maintained ?

One of the major inadequacies of our smallholder farms is the absence of records of events taking place in the herd. These records are valuable to you, your veterinary surgeon and livestock development instructor, for identification of any problems that may arise. It is very important that a separate record is maintained for each animal in the herd. For this purpose, an ordinary exercise book is adequate. For each heifer or cow, maintain the records shown in the format below:

Record Sheet for Buffalo/Cattle

Identity (name or number) : .....

Date of birth : ..... Mother's identity : ..... Breed : .....

Father's identity : ..... Breed : .....

Weight at Birth : .....

Date of first heat : .....

Dates of services : ..... Date of first calving : .....

Calving number	Service dates	PD date and result	Calving date
.....	.....	.....	.....
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Notes on veterinary examinations and treatment :

Other Notes :

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