



agriculture & rural development

Department:
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PROVINCE OF KWAZULU-NATAL

REPRODUCTION IN LIVESTOCK

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Introduction

A feature of successful livestock production systems is that animals reproduce regularly. The reproductive process is influenced mainly by the way in which animals are managed and fed. Genetic factors exert little influence on the way animals reproduce. The challenge facing livestock producers, and especially those involved in producing animals on mainly roughage diets, is to achieve good reproductive rates at the lowest possible cost. In order to achieve this goal, a knowledge of the reproductive process, and the factors which influence reproductive ability, is useful.

The reproductive process

The process which starts with conception and ends with the birth of offspring, is one of the real marvels of nature. After puberty, when animals become capable of reproduction, a host of hormones interplay to result in female animals showing symptoms of heat, or oestrus, on a regular basis. During oestrus, females are receptive to males. Oestrus is exhibited at fixed intervals, the length of which varies between species, and the so-called oestrus cycles are interrupted only by pregnancy, or severe stress, including poor nutrition. The signs of oestrus also vary from species to species. Cattle producers practicing artificial insemination in the absence of bulls rely on the homosexual behaviour of cows, which mount each other during oestrus, to identify animals on heat. Oestrus lasts longer in mature cows than in young heifers, and longer in European cattle breeds than in indigenous breeds. The duration of oestrus, the length of the oestrus cycle and other reproductive data for different species are provided in the table overleaf.

At some time during, or after the end of each oestrus, one or more egg cells or ova are released from the female reproductive organs, the ovaries. Should fertilization of an ovum by a sperm occur, an example in nature of extreme "wastage" takes place. It requires only one sperm to fertilize an ovum, but between 800 and 20 000 million sperm, depending on species, are released at one time by males.



A sufficient number of healthy males is required for normal reproduction

This wastage is, however, necessary to ensure the survival of animals, since many millions of sperm die prior to reaching the released ovum or ova. Subsequent to fertilization, another marvel of nature occurs. The tiny fertilized ovum acts as a signal to indicate that the female is now pregnant, and the normal cycle of hormonal events, including oestrus and ovulation, is interrupted to ensure the maintenance of pregnancy. Shortly prior to birth, a host of hormonal events again takes place, to ensure the initiation of the birth process, and milk production.



Cows in good condition will reproduce regularly

Reproductive management of males

The number of males required to mate females depends on the farming system used. More males are required when a restricted breeding season is used, for example a breeding season of 6 weeks in sheep, or 3 months in beef cattle.

REPRODUCTIVE INFORMATION IN LIVESTOCK

Criterion	Species			
	Cattle	Sheep & Goats	Pigs	Horses
Age at puberty (months)	8 - 15	5 - 6	5 - 6	12 - 18
Recommended mating age (months)	20 - 24	15	7 - 9	36
Length of oestrus cycle (days)	18 - 24 (average 21)	16 - 18 (average 17)	19 - 22	18 - 24
Length of oestrus	10 - 24 hours	24 - 48 hours	18 - 48	4 - 9 days
Time of ovulation	6 - 14 hours after oestrus	Late oestrus	18 - 48 hours after start of oestrus	36 - 48 hours before end of oestrus
Length of pregnancy	9 months	5 months	3 months 3 weeks 3 days	11 months

In these systems, 3 to 4 males per 100 females are required. In systems where males are run with females all year round, only 1 male per 100 females will be required for beef and sheep production.

The production of normal sperm is dependant on males being adequately fed, that is, they must receive adequate amounts of quality feed. Thin, undernourished males and those in excessively fat condition, will not reproduce efficiently. Males also need to be exercised regularly, to prevent them from becoming lazy. Veterinarians should be consulted on inoculation, dosing and dipping programmes for males, since the production of sufficient numbers of normal sperm is dependant on their being healthy at all times.

Reproductive management of females

Assuming that female stock are healthy, their body condition or weight at mating is the factor which exerts the greatest influence on their ability to conceive. Farmers should thus aim to manage their animals so that target weights and conditions are met. For example, beef heifers should attain 75% of their mature weight when mated at 2 years of age. Mature cows have the best chance of conceiving when reaching 100% of their mature weight at mating. Only about 50% of females will conceive when reaching 75% of their mature weight at mating.

The chances of reaching acceptable target weights are maximized when feed resources are matched with the nutritional requirements of beef cows. Thus, calving should be arranged to occur in late winter or early spring, so that cows with suckling calves, which have a high feed demand, can utilize good quality, actively growing spring and summer veld. After weaning in autumn, dry cows will have a low feed requirement and can then utilize poorer quality winter veld grazing.

Diseases, and poor control of internal and external parasites in females can suppress their ability to reproduce. Farmers are therefore advised to consult with veterinarians and other experts to plan effective vaccination, dosing and dipping programmes.

It is possible to improve reproductive rates by manipulating the amount of milk produced by females, or the suckling activity of their offspring. Females which produce excessively large amounts of milk tend to reproduce poorly, especially when nutritional levels are inadequate. Farmers can select against cows which produce excessive amounts of milk, and can reduce the suckling frequency of offspring, by techniques such as temporary weaning (e.g. for 48 hours in beef cattle) or restricted suckling (e.g. suckling beef cows only once a day). The improvement in reproductive rates as result of these techniques varies considerably though, and these measures should be considered only when stock are undernourished.