



## Calculation of reproduction parameters

**SCOPE:** This Info-pack provides a brief description of the calculations of reproduction parameters.

**KEY WORDS:** Scan percentage, conception rate, lambing percentage, fecundity, weaning percentage, survival rate, mortality.

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Grootfontein Agricultural Development Institute.

Reproduction is the key to survival for small stock farming enterprises and it is therefore important that producers measure the reproduction potential of their ewe flocks during each breeding season. This will aid producers in the early identification of ewe and sire fertility problems, as well as problems with regard to the management of ewes and lambs.

### Conception rate and scanning percentage

Conception rate and scanning percentage are two parameters calculated at scanning to firstly express the number of ewes scanned pregnant (conception rate at scanning; CRS) and secondly to express the number of scanned foetuses (scanning percentage; SP). Both these values are expressed relative to the number of ewes mated. These parameters can only be calculated if producers scan their ewes for pregnancy approximately six weeks after the end of the mating season. CRS cannot be above 100%, while SP can range from below to above 100% depending on the number of foetuses. These two parameters are the first parameters indicating the success or failures of a breeding season. CRS for ewe groups of the sires used during a breeding season can also be calculated to determine whether a low CRS was the result of fertility problems of the sires or the ewes.

$$CRS (\%) = \frac{\text{Number of ewes pregnant}}{\text{Number of ewes mated}} \times 100$$

$$SP (\%) = \frac{\text{Number of foetuses scanned}}{\text{Number of ewes mated}} \times 100$$

### Conception rate at lambing

Conception rate (CR) at lambing is used to express the proportion of ewes that lambed compared to the ewes that were mated. CR cannot be more than a 100% and the ideal is a CR of above 90%. The lower the CR, the higher

number of ewes did not lamb for some or other reason. This is therefore an indicator parameter for the reproduction potential of a flock and must be calculated for each breeding season. CR for ewe groups of the sires used during a breeding season can also be calculated to determine whether a low CR was the result of fertility problems of the sires or the ewes.

$$CR (\%) = \frac{\text{Number of ewes lambed}}{\text{Number of ewes mated}} \times 100$$

### Lambing percentage

Lambing percentage (LP) is used to express the proportion of lambs that was born or tagged compared to the number of ewes that were mated. LP can range from below to above 100% depending on the number of lambs that were born.

$$LP (\%) = \frac{\text{Number of lambs born}}{\text{Number of ewes mated}} \times 100$$

### Fecundity

Fecundity (Fec) measures the twinning percentage. In other words, this parameter measures the number of lambs that was produced by a ewe. Fec is therefore used to express the proportion of lambs born or tagged relative to the number of ewes that lambed and will be above 1. A high Fec means that a high proportion of ewes produced more than one lamb during the mating season.

$$Fec = \frac{\text{Number of lambs born}}{\text{Number of ewes lambed}}$$

### Weaning percentage

Weaning percentage (WP) is used to express the proportion of lambs that was weaned compared to the number of ewes that were mated. WP can range from below to above 100% depending on

the number of lambs that were weaned. This is an important parameter to assist in the identification of problems during the breeding season with regard to the ability of ewes to successfully rear good quality lambs and management of the ewe and lamb flock prior to weaning.

$$WP (\%) = \frac{\text{Number of lambs weaned}}{\text{Number of ewes mated}} \times 100$$

### Survival rate

Survival rate (SR) is used to express the number of lambs that are weaned (survived until weaning) compared to the number of lambs born alive. SR cannot be above 100% and it should therefore be the aim of producers to ensure that as large as possible a portion of the lambs that were born alive survived until weaning. A flock with a low SR indicates that a large number of lambs that were born alive did not survive until weaning.

$$SR (\%) = \frac{\text{Number of lambs weaned}}{\text{Number of lambs born alive}} \times 100$$

### Mortality rate

Mortality rate (MR) is used to express the number of lambs that died before weaning compared to the number of lambs born alive. MR can range from 0 to 100% and it should therefore be the aim of producers to keep MR as low as possible. A flock with a high MR indicates that a large number of the lambs born alive, died before weaning. MR can also be calculated for specific periods between birth and weaning.

$$MR (\%) = \frac{\text{Number of lambs died}}{\text{Number of lambs born alive}} \times 100$$

### Example

A producer mated 700 ewes and 675 of these were scanned pregnant with 1025 fetuses. Six hundred and sixty (660) of these ewes lambed, 990 lambs were born and 920 lambs were weaned.

$$CRS (\%) = \frac{\text{Number of ewes pregnant}}{\text{Number of ewes mated}} \times 100$$

$$CRS (\%) = \frac{675}{700} \times 100$$

$$CRS (\%) = 96.4\%$$

$$SP (\%) = \frac{\text{Number of fetuses scanned}}{\text{Number of ewes mated}} \times 100$$

$$SP (\%) = \frac{1025}{700} \times 100$$

$$SP (\%) = 146.0\%$$

$$CR (\%) = \frac{\text{Number of ewes lambed}}{\text{Number of ewes mated}} \times 100$$

$$CR (\%) = \frac{660}{700} \times 100$$

$$CR (\%) = 94.2\%$$

$$LP (\%) = \frac{\text{Number of lambs born}}{\text{Number of ewes mated}} \times 100$$

$$LP (\%) = \frac{990}{700} \times 100$$

$$LP (\%) = 141.0\%$$

$$Fec = \frac{\text{Number of lambs born}}{\text{Number of ewes lambed}}$$

$$Fec = \frac{990}{660}$$

$$Fec = 1.5 \text{ lambs / ewe}$$

$$WP (\%) = \frac{\text{Number of lambs weaned}}{\text{Number of ewes mated}} \times 100$$

$$WP (\%) = \frac{920}{700} \times 100$$

$$WP (\%) = 131.0\%$$

$$SR (\%) = \frac{\text{Number of lambs weaned}}{\text{Number of lambs born alive}} \times 100$$

$$SR (\%) = \frac{920}{990} \times 100$$

$$SR (\%) = 92.9\%$$

$$MR (\%) = \frac{\text{Number of lambs died}}{\text{Number of lambs born alive}} \times 100$$

$$MR (\%) = \frac{70}{990} \times 100$$

$$MR (\%) = 7.1\%$$