

## REPRODUCTION WORKSHOPS

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Two case studies involving poor reproductive performance in deer herds were presented. The basis of each case study is outlined followed by the results of on-farm investigations and recommendations for rectifying the problem.

### POOR REPRODUCTIVE PERFORMANCE IN 2 YEAR OLD HINDS

#### The problem

- As some red deer herds have increased in numbers, their reproductive performance in terms of % calves weaned has declined.
- This is particularly pronounced in first calvers with some herds which were consistently weaning 95% or better now only weaning 70% from their first calving 2 year old hinds. As 3 year olds, the weaning percentages are about 95%.
- Preliminary investigations have revealed that the body weights of yearling hinds have increased over the years in these herds. Those hinds which fail to wean a calf are spread throughout the weight range. The problem is one of conception rate, not pre-weaning deaths of calves.

#### Approach

The problem occurs on larger properties who are now mating up to 400 yearlings. The segregation of age groups has increased greatly with the increased numbers. The yearlings are mated within their own age group. A number of possibilities have been considered in attempting to identify this problem. Disease possibilities including leptospirosis have been investigated but there was no evidence of any involvement. There are no obvious trace element deficiencies and hinds have been given 2 doses of a multi-mineral mix (including iodine and selenium) pre-mating with no effect on calving percentage. Pasture quality is good and the pasture does not contain oestrogenic plants. The hinds are well fed and tend to gain or at least maintain weight from mating through to June. Weaning percentages of these hinds as 3 year olds are as expected at about 95%.

The problem occurs in both single sire (1 stag to 35-50 hinds) and in multi-sire groups (eg 1 stag to 20-25 hinds with groups of up to 200 hinds in large broken paddocks). Analysis of the calving spread revealed no changes compared with previous years when good calvings were achieved.

The problem appears essentially due to the yearling hinds either not cycling or not holding to service. There is some evidence that yearling hinds run on their own may not come into oestrus until late April-early May (about one month later than adults) and that the period of oestrus may be shorter than in older hinds. This raised the possibility that a reduced opportunity for successful mating was the basis of the problem. Consequently a number of strategies were tried on different properties.

Dry adult hinds were run with the yearling hinds from about mid-February (the stags went out in late March). In some cases these older hinds were treated with progesterone/PMSG in March to ensure that they would be cycling around the time the stag went out (it seems that 10% adult hinds or fewer is probably adequate). In some cases, the yearling mobs were run

with a group of yearling stags at about 1:10 ratio. Both strategies were apparently successful in that pregnancy rates (by ultrasound) and weaning rates have increased to that expected (about 90%).

**PROBLEMS IN A WAPITI HERD**

The problem

- This case involves a base wapiti herd being hybridised with Canadian elk (wapiti) bulls. The objective is to breed Canadian elk cross bulls for sale.
- The presenting problem was poor weaning weights in year 3 compared with those of the previous 2 years along with some wasting hinds and a high death rate of calves pre-weaning. The calving spread has not changed with the bulk of the calves born in the December 3-12 period, with the first calves born about November 27.
- The reproductive performance is summarised below. The increasing mid-winter hind weight reflects an increasing influence of Canadian elk genes.

Year	Hinds mated	Calves			Calving percentage (calves born/hinds)		Mid-winter hind weight (overall mean)
		born	weaned	wean wt	Adults	1st calvers	
1	39	37	37	90	93 (25/27)	100 (12/12)	150 kg
2	46	39	38	91	84 (27/32)	85 (12/14)	160 kg
3	65	59	48	74	93 (43/46)	84 (16/19)	170 kg

- Wasting hinds: Of the 65 hinds mated in year 3, 10 developed the "wapiti/elk wasting syndrome", with 8 dying during lactation and 2 recovering. The young elk/wapiti cross hinds were the worst affected (7/33) with 5 of these dying (the wasting is not confined to hinds with 2 of 25 bulls also suffering).
- Calf deaths: Five of the 11 calves died from yersiniosis (cause identified and the remainder treated) while the other 6 deaths were undiagnosed. None of these 6 were from the badly wasting hinds although 4 were from the first calvers.
- Weaning weights: The calves are weaned in late March. The difference in weaning weight between the three years is pronounced. Some of the smallest calves at weaning in year 3 were among the first born in November.
- Hind management: From June when the bulls come out, the hinds are supplemented for 3 months with ad lib meadow hay plus 1 kg oats/head/day and some grass "picking". In years 2 and 3, the hinds were "tightened up" from early October, about 6 weeks before the first calf was expected. "Tightening up" involved the hinds being set-stocked at about 37/hectare on good country but without any hay or grain supplement. All hinds are run together. Just before the first calf is expected, the hinds are shifted to a paddock with plenty of good quality pasture. Only 3 of the 135 calvings have required assistance, two of these being the same hind and the other her daughter.

- Animal health history: All hinds are given copper needles annually at weaning (2 X 4 g) while weaners are also given copper needles at weaning. There has been no clinical evidence of copper deficiency. The calves are drenched with Ivomec at weaning and monthly until June and then monthly from August to October. Hinds are drenched twice a year.

#### Approach

In investigating this problem, it was obvious that considerable stresses must have been involved when sucking calves were dying of yersiniosis, although the feed supply and quality at this time appeared as though it should have been adequate for lactating hinds. However the condition and the death of some hinds indicated severe problems. Some simple calculations of feed requirements during winter and spring indicated the probable basic source of the problem. The hinds were being obviously underfed in spring ("tightening up") and also in winter. The appropriate calculations are:

Liveweight of 170 kg  $\equiv$  Metabolic liveweight ( $\text{kg}^{3/4}$ ) of  $47 \text{ kg}^{3/4}$

Winter : Assuming a winter maintenance requirement of  $0.85 \text{ MJ ME/kg}^{3/4}/\text{day}$  gives a total requirement of  $40 \text{ MJ ME/day}$  (this could be reduced by about 5% to allow the hinds to lose a little weight over winter, but only if they were in good condition after mating).

The hinds were being fed ad lib meadow hay and 1 kg of oats per day.

The oats would provide about  $9 \text{ MJ ME/day}$  ( $1 \text{ kg} \times 85\% \text{ dry matter} \times 95\% \text{ utilisation} \times 11.5 \text{ MJ ME/kg DM} = 9.3$ ) or about 25% of the total maintenance requirement.

Therefore the hinds need about  $30 \text{ MJ ME/day}$  from the meadow hay and the grass picking; if it all was to come from meadow hay it would be  $30/8.5 = 3.5 \text{ kg DM}$  or  $4.1 \text{ kg meadow hay}$  as feed (meadow hay contains about  $8.5 \text{ MJ ME/kg DM}$  and about 15% moisture, ie 85% DM).

For a 170 kg hind this amounts to 2.5% of body weight from hay alone - put simply this is an impossible intake to achieve.

Practically the only way to increase winter intakes would be to increase the grain offered.

Spring : With improving climatic conditions, the maintenance requirements could be expected to be 15-25% lower than winter, but there is also the growth of the conceptus to be considered. Therefore a requirement of about  $35-40 \text{ MJ ME/day}$  would appear to be reasonable.

Pasture growth is likely to reach  $60-80 \text{ kg/ha/day}$  at this time in this area. Allowing for a cover of  $1500 \text{ kg/ha}$  when the hinds went in to the paddock grazed down to a very low residual of  $800 \text{ kg/ha}$  (leaving  $700 \text{ kg}$  available to eat) and a daily growth rate of  $70 \text{ kg/ha/day}$  would mean that over a 40 day period the hinds would have available:

$700 \text{ kg DM plus } 40 \text{ days} \times 70 \text{ kg/day} = 3500 \text{ kg}$

or about  $95 \text{ kg/hind}$  for the period or  $2.4 \text{ kg/hind/day}$  or  $27 \text{ MJ ME/hind/day}$ .

This is only about 65-80% of their requirement. Consequently the hinds would be expected to lose considerable weight under these conditions, and be in very poor condition at calving. Poor lactation performance could be expected to follow leading to poor weaning weights.

Being in poor condition could well have predisposed the hinds to the "wapiti/elk wasting syndrome" which is a complex of conditions usually involving internal parasites, low copper status and possibly some mycotoxic involvement. It is also possible that there is a periparturient rise in parasite burdens which could also be a factor.

Correcting the problem would involve better nutritional management with improved feeding in winter while still allowing some weight loss. This winter weight loss helps prevent calving difficulties by ensuring that the hinds are leaner at the start of the spring pasture surge when it is difficult to prevent considerable weight gain without compromising the health of the hinds. Hinds must be well fed in spring if they are to remain healthy and lactate satisfactorily (see Pearse 1988, this Proceedings). This problem highlights the importance of good nutritional management and the necessity for careful ongoing monitoring of hinds during winter and spring.