Weaning systems and growth

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Background

During the Autumn of 2001 an extensive trial, involving 400 Elk-cross and Wapiti-hybrid weaners, was carried out to evaluate the relative effectiveness of two differing endectocide families for internal parasite control in Elk-type animals. This was to follow up on earlier information produced by Invermay (AgResearch) indicating that moxydectin was the drug of choice in Elk-cross animals. In parallel with this trial work I saw the opportunity to investigate three of the various weaning systems commonly used on N.Z. Deer farms, and to evaluate subsequent growth rates and animal health problems for the Autumn and Winter periods.

Information obtained from the Deermaster project, Richmond-Wrightson H.B. Performance Programme, and AgResearch Invermay (Pollard et al. 2000) has indicated that early (Pre-rut) weaned calves grow more slowly [99gm/h/d vs 125 gms/hd/d – Pollard] during the autumn and early winter. This early advantage of Post-rut weaned calves may be lost when a longer term view is taken, looking at lower hind condition scores at weaning and hence a later conception/fawning date in the subsequent season. It is also possible that rapid autumn growth rates in calves may be off-set by slower winter and spring performance.

Trial Method

Three weaning options were investigated.

1. Wean Pre-rut (March 6)

2. Wean Pre-rut and relocated weaners to finishing farm. This is a common scenario for farmers purchasing weaners to finish. Weaned March 1 – relocated on March 6

3. Wean Post-rut (April 17). Calves removed from hinds when single sire mating ended and hinds mobbed up with back-up stags.

All weaners were allocated to groups according to sex and the weaning system, with the six possible options having a minimum of 33 animals and a maximum of 72 in any one group. Deaths were recorded and where possible diagnoses made and evaluated as to whether the weaning system may have had an influence. The weights of any animals dying during the trial were removed totally from the data.

The calves were weighed every 6 weeks to coincide with endectocide treatment.

Results

Table 1. Weights of male calves (kg)

Group	Date	6 Mar	17 Apr	28 May	9 Jul
Pre-rut	Average (n=72)	62.236	70.847	78.87	86.97
	six week gain		8.61	8.03	8.1
Relocate	Average (n= 33)	58.57	74.42	72.51	80.18
	six week gain		15.85	-1.91	7.67
Post-rut	Average (n= 39)	57	69.23	70.22	78.6
	six week gain		12.23	0.99	8.37

Figure 1. Male weight gain pattern

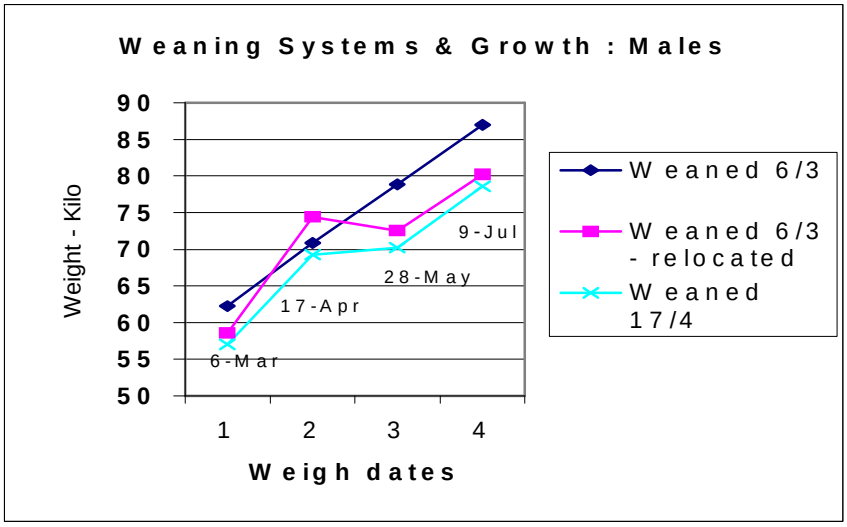
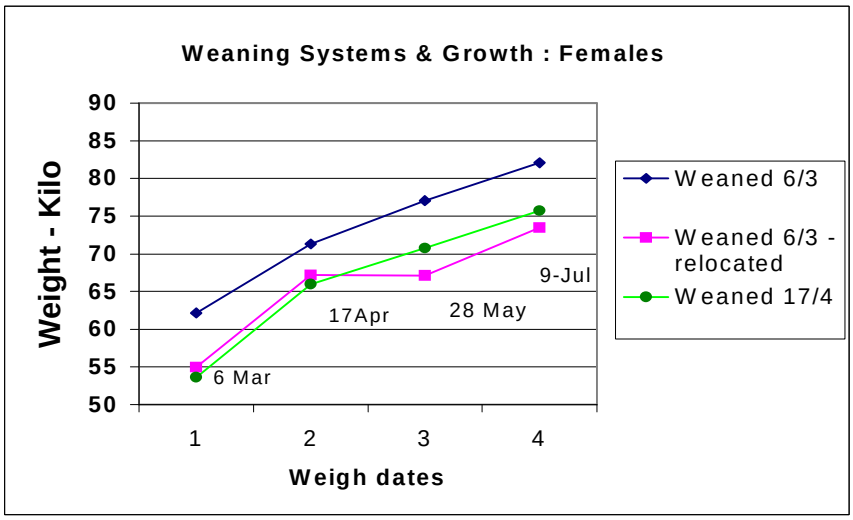


Table 2. Weights of female calves (kg)

Group	Date	6 Mar	17 Apr	28 May	9 Jul
Pre-rut	Average (n=58)	62.15	71.31	77.02	82.09
	six week gain		9.15	5.71	5.07
Relocate	Average (n= 42)	54.98	67.17	67.15	73.45
	six week gain		12.19	-0.02	6.31
Post-rut	Average (n= 46)	53.61	66	70.76	75.72
	six week gain		12.39	4.76	4.96

Figure 2. Female weight gain pattern



Deaths

1. Post Rut wean – 1 death during trial. No diagnosis.
2. Wean & Relocated – 2 deaths during trial. 1 Facial Eczema chronic scour. 1 injury.
3. Pre-rut wean - 9 male deaths and 5 female deaths.

    - Per acute fibronous pneumonia. 5 deer died 10 – 12 days post weaning.
    - 7 deer chronic scouring and weight loss (associated with F.E.)
    - septic arthritis following foot abscesses
    - 4 – 5 others developed laminitis or continued to fade over winter, but didn't die during trial period.

Conclusions

6 March – 17 April

- Pre-rut weaned calves had the slowest growth rates of all options. True for both males and females even though this group had the heaviest weaning weight and the highest overall percentage of Elk genes (ie growth potential). 205 g/d males, 218 g/d Females.
- The animals that were weaned early then relocated away from their dams performed exceptionally well in the 1st 6 weeks post relocation. Males – 376 g/day Females 290 g/day
- Post rut weaned females and males performed better than all groups apart form the relocated males during the 1st period. (Females 295 g/d Males 290 g/day)

17 April - 28 May

- During late autumn and early winter all groups slowed down apart from the early weaned males which continued on at approximately the same rate. In general the groups which were growing the fastest in autumn suffered the greatest reductions in growth.
- Conversely the early weaned group of both males and females rapidly re-established their advantages held at the trial start date. The severe check suffered by the relocated male group in particular may be explained by disease as up to 30% actually lost weight.

28 May – 9 July

- All groups returned to a normal growth pattern. Males achieved 200 g/d and females 125 g/d for what would normally be considered the low point of the year's growth cycle. In general, groups performing poorly in the previous period had the highest growth rates (compensation) overall. However, groups held the same relative position at the end of the trial as they had at the start. The heaviest weaners continued to increase their size advantage over the rest.

Deaths

Death rates were low in the Post-rut wean group, slightly higher in the relocated group, but unacceptably high in the early weaned group. This high death rate was exacerbated further by a number of animals which developed laminitis and chronic FE problems early post weaning but continued to survive and under perform throughout winter and spring.

Deaths due to per-acute fibrinous pneumonia over a very short period of time, I believe, were caused by factors associated with the trial but not the result of the weaning regime. The mob affected ended up being left in the deer shed over night because of the time taken to allocate to treatment groups, apply treatments, zinc bullet treat and weigh. In the morning there was an easily detectable smell of ammonia, sufficient to irritate the eyes, and I consider this damaged the lungs allowing infection to develop in some individuals.

Facial eczema was only a problem in the weaned groups. The relocated group were born and grazed until weaning in an FE-free area. (500-600m above sea level) and didn't face a sporidesmin challenge until early to mid April when spore counts increased again. This would help to explain the extreme drop in growth rate during the second 6-week period.

The early weaned group containing more high elk-gene animals demonstrated clear evidence of facial eczema challenge including 7 deaths (see paper elsewhere in these proceedings on FE for explanation.)

Observations

The behavioural patterns of the weaned groups were noticeably different.

- The relocated yet early weaned group settled very quickly and within 3-4 days were grazing in a settled pattern with very low levels of fence pacing or weaner vocalisation.
- The early weaned group which stayed on the farm took much longer to return to normal behaviour. Large scale fence pacing with constant vocalisation was evident. Despite trying to separate dams and calves as far as possible (>750m) they were able to hear each other and calves could be heard calling and their respective dams replying. This pattern continued for 2-3 weeks at decreasing intensity but calves clearly recognised and attempted to contact dams when animals were shifted along raceways.
- The late weaned group demonstrates far lower levels of fence pacing and calling and within 5-6 days most calves were feeding and resting normally. Calves spent considerably more time away from their dams grazing etc prior to late weaning and the mothers appeared to have reduced udder development. (less milk?).
- Wapiti and hybrid calves are at a lower percentage of their adult body weight when weaned pre-rut compared with red weaners. This level of immaturity may mean they are more dependent on milk and less able to cope on grass only, especially if weaning weights fell below 55-60kg. The effects of this will be increased if pasture M.E. values are lower than 10-10.5 at the weaning date.

Discussion

Many people look towards industry-funded production information to provide clear solutions to their individual management problems. This study shows just how complicated an issue can be on a single property and how figures on growth rates alone can lead to inappropriate choices, if diseases particular to the unique farm environment and its stocking programme are not considered carefully. The great variation in latitude throughout N.Z. means that we have to be very careful before applying Canterbury produced answers to uniquely Waikato generated problems.

I believe that both compensatory (and de-compensatory) growth can occur in young deer following management or disease induced checks provided that ideal conditions are presented almost immediately after the insult is removed. The longer the time span between limiting factors and the return to ideal conditions the lower the level of compensation achieved. The converse is also true in that animals that achieve exceptional growth rates during one seasonal phase may slow down to much more modest growth without any clear change in nutritional opportunity.

Deer farmed in the upper North Island seem to be able to express far greater winter growth rate potential than their South Island counterparts but this is countered by poorer spring and summer performance. This occurrence is not totally explained by nutritional opportunity and seems to be an adaptation of the animal to altered environmental conditions. These variations in growth potential could possibly affect trial data should experimental groups be formed using animals that have performed differently during periods immediately prior to trial commencement.

The information presented here and in my paper elsewhere in these proceedings on FE has forced a major change in my management policy towards a later weaning regime. The challenge now is to prove that lower hind condition scores and later conception dates are a function of our ability to provide adequate nutrition of a high enough M.E. value during the difficult autumn period and not because of lactation-induced anoestrus. Experience gained from the dairy industry would suggest that it is our inability to feed adequately that is the major limiting factor. In a natural environment deer lactate, gain body condition prior to winter and conceive without problems.

References

Deermaster . Deer Industry Manual (2000) pp.21, 43.