

MANAGING THE BEEF COW HERD

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The management on sheep and beef cattle farms ranges across the spectrum from extensive, where conservative stocking rates are used and the animal body weight acts as the main buffer between pasture production and feed requirements, through to intensively managed and planned systems where the farmer makes more decisions on a day to day basis to achieve this balance. In the more intensive systems, management to increase animal production is focused on lambing and calving live weight targets, weaning date, flushing, and the timing of the sale of store lambs, weaners, cull ewes and cull cows and finished steers or bulls.

The points made above highlight the fact that most beef production is in conjunction with sheep or deer production. In these situations consideration must always be given when evaluating a beef cattle operation to what feed other stock are making available (or missing out on) at various times of the year, and how their performance will change if the beef system is changed.

Good nutrition in beef cow production, as with any animal production, is paramount. Animal health and production problems, more often than not, simply have nutrition as a basis. Beef cows have the advantage that high levels of nutrition are only required for a specific period of the year. They have the disadvantage, however, that if the nutritional requirement is not met over that critical period, not only poor production will result but large losses can occur.

The objectives of most commercial beef breeding cow herd are to:

- rear to weaning a large number of calves (95) per 100 cows mated each year
- wean calves with a heavy liveweight (50% of autumn cow liveweight)
- maintain a low death rate in the herd (2 to 3% per annum)

- make use of the breeding cow in promoting and maintaining improved pastures.

For simplicity we can divide the annual nutritional requirements of mature spring calving cows into the following periods: Post-weaning; Pre-calving; Post-calving; Post-mating. Body condition scoring has been used as an aid to feeding and management of the herd at critical periods of the yearly production cycle

Post-Weaning (weaning up to 4-6 weeks pre-calving)

Weaning of beef calves normally occurs at five to seven months of age. It can be carried out successfully at four months (this can be a drought management strategy) provided appropriate provision is made for post-weaning feed for the calf. In the beef cow calendar this leaves around five months of the year that beef cows are low priority stock and can function as 'work horses' eating rank pasture and controlling shrub re-growth. During this time, priority can be given to other classes of livestock and cows become one of the few groups available that can be restricted in the interests of better pasture development and utilisation. This is a major justification for maintaining a breeding cow herd on hill country. Not only has it significant advantages for the farm as a whole, but it has in fact been shown to be beneficial for the cows to lose around 10% of their live weight in the post- weaning period.

Cows losing that order of weight will have better longevity and will suffer no reduction in performance, provided their nutritional requirements are met in the pre- and post-calving periods. Cows too fat (in excess of condition score 3.5) at calving are more prone to calving difficulties and to metabolic disease. A reduction in intake should not be carried out too rapidly with fat cows, as even in autumn (or indeed any time of the year) fat cows can suffer from hypomagnesaemia if subjected to sudden severe restrictions in intake. Another factor to consider is that cows are such good foragers that they place themselves at risk from misadventure, like falling from rim-rocks, when being used to 'tidy up' paddocks with natural hazards.

Some farmers rotationally graze their cows behind the ewes in a winter rotation during this period. In such situations cow intakes are kept very low e.g. Angus cows can eat as little as 3-3.5kg DM/day. This highlights their efficiency and supports the

contention that an efficiently managed beef cow could have a true winter stock unit cost of 3.5 stock units.

The ability of beef cows to lose weight through the winter is dependent on body condition. Obviously thin cows at weaning (condition score less than 2.0), a situation that might arise after a prolonged summer drought, cannot be fed below maintenance for extended periods.

Pre-calving (from 4-6 weeks pre-calving to calving)

Cows that have lost in the order of 10% body weight post weaning will need to regain condition pre-calving. If they do not, there is a risk they will be simply too weak at calving - prone to metabolic problems - and their calf losses will be high (of the order of 10%-20%). A relatively short period (4 weeks) of good nutrition (around 8kgDM/cow/day) is usually sufficient enough to have the cows gain the liveweight taken off since weaning. Note that the calf is gaining at 250 grams/day in utero during the last month of pregnancy. If feed is available, weight gain on cows will be easier to achieve pre-calving than during early lactation and is unlikely to have any significant effect on calf birth weights, except at extremes of feeding levels. If cows calve in good condition (condition score 2.5 – 3.0) it will make the mating condition target of 3.0 or better a lot easier to meet.

While poor pre-calving nutrition and body condition score will exacerbate post-calving under-nutrition problems, priority in terms of feed allocation should be given to the post-calving period. This can be achieved by shedding cows out from a moderate plane of nutrition to a high plane as they calve, or by strip grazing, or simply by shifting into saved feed at the start of calving.

Post-calving (calving to mating)

Experience suggests that a feed budget should allow for a cow to eat in excess of 12kg DM /day from the day of calving. How this is achieved will depend on the time of calving, but even herds calving close to their pasture growth curve will need to save feed forward from late winter. The area chosen for calving should be of easy contour

and free of hazards like creeks, tomos (underground holes) and swamps as these cause significant calf losses. Post-calving nutrition is critical for several reasons:

Cow survival - the majority of cow deaths from hypomagnesaemia occur post-calving and peak in the second week of lactation as the demands of the calf increases. Provision of good quality pasture above 2500kg DM/ha (12cm high) is the key to its prevention.

Calf growth rates - cows will buffer their calves when under-fed in early lactation by losing liveweight to maintain milk production. However, in high producing Hereford x Friesian cows in a condition score of 2.5 or better at calving it may be necessary to hold feed back for first 3-4 weeks post-calving. This is because the calves are unable to consume all the milk produced by these high producing cows. A recent trial indicates that a sward (pasture) height of 6cm is sufficient for Hereford x Friesian heifers during the first month of lactation, increasing to 10-12cm during the second month of lactation. Calves should gain at least 1.0kg/hd/day while suckling their dams

Subsequent cow pregnancy rate and calving pattern – There are two aspects to consider whether the cow is pregnant or not and when the pregnancy was achieved. Cows fed in excess of 12kgDM/day from calving and consuming up to 20kgDM/day prior to mating should be near a condition score of 3.0 by mating

Post-Mating (mating - weaning)

If a 52-55 day mating interval is used for mature cows, then calves will be aged between 80-140 days at bull withdrawal. Weaning can be carried out at this stage but very high quality feed is required to achieve calf liveweight gains of the same order as later-weaned calves (egg at six months). Cows in a condition score of 3.0 or better at mating can be used in the late summer-autumn period to clean up low quality summer pasture with their calves at foot.

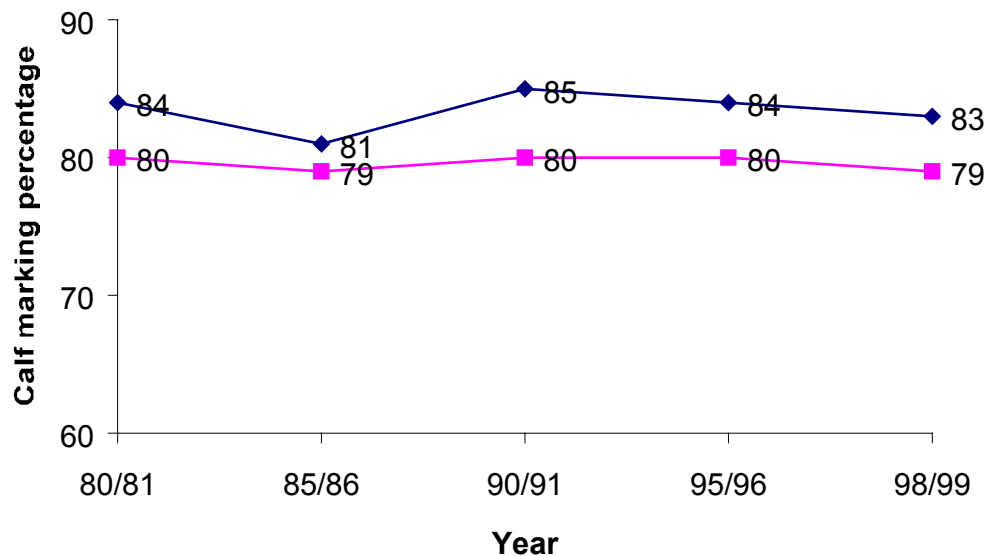
The main advantage of early weaning appears to be in retaining cow body condition, which, if the previous management has been correct, should not be an important issue. However in case of droughts, and a resultant wish to graze cows off the farm as part of the drought management strategy, early weaning can be practiced. Weaning time is often determined by managerial convenience and to suit weaner sale dates in the district. Farmers often like to wean on the day of the weaner sales so calves are

trucked to the sale straight off their mothers and so as they look in fine condition. However if calves are not being sold i.e. they are to be kept on the farm then weaning can be in relation to feed supplies. Much earlier weaning dates in case of drought or much later in case of good autumn pasture growth rates.

Reproduction in the cow herd

Reproductive efficiency in cattle, as measured by the number of calves born and weaned each year per 100 females in the breeding herd, is considered the most important economic factor in cattle production. The potential reproductive rate of beef herds has been documented by the Meat and Wool Boards Economic Service of New Zealand which records the number of calves marked per 100 cows joined with the bull (calf marking percentage). Figure 1 indicates there is no time trend, while the lower values for the North Island hard hill reflect the less favourable physical conditions in that environment. We can conclude from this data that there is considerable potential to improve reproductive efficiency in our beef cow herds.

Figure 1 Calf mating percentages (1980/81 to 1998/99) for North Island hard hill country (■) and for all New Zealand (◆)



Not only do we need to get a high proportion of cows in calf but this should occur over a well defined period. An excessive calving spread in a beef cow herd can reduce production. The advantages of a compact calving include:

- Easier allocation of feed to meet the cows feed requirements
- Easier allocation of calving paddocks
- Ease of supervision at calving
- An even line of weaners for sale
- An even line of replacement heifers
- A higher proportion of cows are likely to be cycling when the bull goes out

In practice there is often a compromise between acceptable duration and timing of calving and potential reproductive performance, and it is the successful management of this compromise that is the key to successful reproduction in beef breeding cow herds.

We can now however identify some useful reproductive targets for an adult beef cow herd.

- 12 month (365 day) mean calving interval
- a 63 day (3 cycles) mating period for cows
- a pregnancy rate of at least 90% (some regularly achieve 95%) for adult cows
- a calf weaning percentage of at least 85% in adult cows (the best achieve +90%)
- less than 3% abortion rate
- at least 70% of cows calve in first 21 days of calving
- less than 5% incidence of dystocia (difficult birth)

(farmers usually have zero tolerance for dystocia in cows under extensive conditions)

To the above list we can add targets for replacement heifers (these are to be discussed in more detail later).

Note - An oestrous cycle is $21 \text{ days} \pm 1-5 \text{ days}$ and 2 cycles = $42 \pm 3 \text{ days}$. Some farmers also mate cows for $2\frac{1}{2}$ cycles i.e. $7\frac{1}{2}$ weeks = 52 days to ensure a cow that cycles on day 22 which is not mated and cycle 22 or 23 days later has an equal chance

of being mated twice. If a 42 day mating was used this would not be the case and the cow could have only one opportunity to be mated.

Another reason for restricting mating to 2½ to 3 cycles (53-63 days) is shown in Table 1. In this example the herd that was mated for 105 days (5 cycles) and where the entire herd was cycling when the bull was introduced, and a 60% conception rate is assumed (this is normal for natural mating - it usually ranges from 50-75%) then after 63 days of mating 94% are pregnant and it takes another 42 days for the remaining cows to get pregnant.

Table 1 Pattern of mating and conception during a 105 day mating period - assuming a 60% conception rate (Morris 1998).

| Days since start of joining | Number on heat each 21 days | Number pregnant each 21 day period |
|-----------------------------|-----------------------------|------------------------------------|
| 21 | 100 | 60 |
| 42 | 40 | 24 |
| 63 | 16 | 10 |
| 84 | 6 | 4 |
| 105 | 2 | 2 |
| 0-105 | 164 | 100 |

Time of calving

There are risks associated with too early a mating date and too late a mating date.

Risks associated with too early a mating date are:

- Cows calve before spring flush
- There is greater requirement for saved pasture pre-calving
- Cows are usually in a lower condition score at joining
- Cows exhibit longer post-partum anoestrus intervals
- Usually results in a later calving next year

Risks associated with too late a calving:

- Waste of the spring flush
- Results in smaller calves at weaning

- Peak lactation is reached to late in the summer dry risk period
- Reduced opportunities for re-mating

Table 2 Average lambing and calving dates

| | Calving | Lambing |
|----------------------|-----------|-------------|
| NI hard hill country | 21 August | 19 August |
| NI hill country | 13 August | 13 August |
| SI high country | 24 August | 9 September |
| SI high country | 30 August | 3 October |

On average (except for South Island high country) beef cows are planned to calve at same time or before lambing (Table 2). Many farmers are questioning this as being too early and in terms of efficient reproduction then this is certainly the case. In reality as most beef cows are run with sheep and the optimum time to mate depends on many individual property features such as the cattle : sheep ratio, stocking rate and genotype of cow.

The calving pattern is an excellent guide to the suitability of mating date. If less than 50% are calving in the first 21 days of calving then mating date is probably too early. Remember the target was 70% of cows and heifers mated in first 21 days of mating - hence at least 60-70% should calve in the first 21 days of calving. It is a relatively simple procedure for a farmer to collect this information. This is done by simply counting the number of calves born per week and then plotting them over 21 day periods throughout the calving period which will give a detailed picture of how the previous years mating went.

Breeding systems

There are two basic breeding systems. If the source of replacement females is heifers produced in the herd this is a *continuous* system. If heifers are not put back in the herd this is a *terminal* system. In terminal systems both replacement females and sires must come from external sources; they are either purchased or come from another herd. A combination of relatively small dams bred to larger sires in a terminal system fully exploits complementarity. In addition to exploiting hybrid

vigour, crossbreeding in beef cattle has the advantage of allowing breeds to be chosen for complementary characteristics. For example, crosses between dairy and beef breeds can be used to produce cows that, when fed suitably, have superior milking and reproductive ability. Mating these animals to terminal sires with large mature size and growth rates allows slaughter offspring to be produced with the benefits of growth rate and leanness to attain heavy carcass weights while maintaining smaller, highly productive breeding cows. In this way, the breeds can be chosen to complement each other in a manner not achievable with straightbred animals. This is probably the best reason for using crossbreeding.

The benefits resulting from crossbreeding are best achieved through increased fertility of crossbred cows and growth rate of calves by adopting a policy of buying-in all heifers, 100 percent of the cows in the herd can be mated to a terminal sire. This results in maximum heterosis of about 23 percent. A common system used by farmers is the purchase of Beef x Dairy cross heifers (Hereford x Friesian or Angus x Friesian) as weaned calves, mating these at 15 months to an easy calving sire breed (e.g. Angus, Hereford, Murray Grey) and from then on to a larger terminal sire breed (e.g. Simmental, Charolais, Limousin or South Devon). The main disadvantage of this system is the need to organise a reliable source of replacement heifers.

Research indicates that the Friesian cross cow is a more productive breeding cow in most environments. The exception may be in hard hill country with large paddocks where the beef breeding cow is the pasture control mechanism and her body condition is the “supplement” to get through feed deficit periods. In these situations the British breeds may be more efficient at this weight gain over summer and weight loss over winter. In these environments mating heifers at 15 months may not be practised and hence the reproductive advantage of the beef cross dairy cow may not be realised. However where management is seeking more productive cows then the Friesian cross cow can give considerable lifts in productivity and profitability provided cow liveweight is not increased disproportionately to the potential extra calf production.