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The current status of the beef breeding cow in New Zealand mixed livestock production systems

R.W. WEBBY AND R.D. THOMSON

AgResearch, Whatawhata Research Centre. Private Bag 3089, Hamilton, New Zealand.

ABSTRACT

The total beef breeding cow herd in New Zealand, currently numbers 1.45 million head. Of the total beef herd, breeding cows make up only 30%. In 1975 when numbers peaked at 2.31 million, breeding cows made up 37% of the total beef herd. Despite the decline in the New Zealand breeding cow herd, beef production now exceeds 1975 levels. Per head carcass weights have increased and there is an increasing contribution of beef cattle from the dairy industry. Pastoral land losses to forestry are expected to exceed 500,000 ha in the next decade, much of this from areas grazed by breeding cows.

The beef breeding cow is complementary to the performance of other stock classes. Her seasonal feed demand profile, her ability to utilise surplus often low quality feed, buffer herself against periods of low feeding and to be a source of equity and income stabilisation is highly regarded by farmers. Compared to a traditional self replacing beef breed herd, a dairy beef cross breed herd where all replacements are sourced from the dairy industry will return up to 43% more revenue per hectare. With the development of new technology there is growing potential for the beef breeding cow to compete at all levels of the beef production line.

Keywords: beef breeding cow; beef; complementary; new technology; land use.

INTRODUCTION

Cattle were initially introduced into New Zealand mainly as work and dairy animals. Beef production was little more than opportunist. The use of cattle as draught animals has long since disappeared and cows have now specialised into dairy or beef production. Beef cow herds may comprise of dairy beef cross breeds or straight beef breeds.

The beef breeding cow has developed a complementary role in mixed sheep and beef livestock farming systems. Her traditional position as a matriarch of the beef industry, however, has been challenged as farmers seek out alternative more profitable livestock enterprises. Changes that may make the beef breeding cow more profitable in a more intensive role could however mean that she would no longer be complementary to other livestock systems, such as beef finishing, but would run in direct competition for feeding priority on the farm.

This paper covers the numbers, and distribution of beef breeding cows in New Zealand. The way farmers see beef breeding cows as part of their farming system is reviewed. Results of analyses covering both financial and systems aspects of some typical beef breeding policies are presented and discussed. The current and future role of the beef breeding cow and the opportunities for her are also reviewed and discussed.

Contribution of beef and dairy cows to beef production

Beef cattle numbers reached a peak in New Zealand in 1975 (Table 1), when breeding cow numbers made up 37% of the total beef cattle. By 1993 this proportion had declined to 30%. Currently beef cattle numbers are 77% of their 1975 levels. Numbers were at there lowest in 1983 and have gradually increased since. The drop in beef cattle numbers was offset by an increase in dairy cattle numbers which provided an increasing supply of both dairy and dairy cross calves into the beef industry.

In 1990 beef production exceeded the levels achieved in 1975 (Table 2). Although there are 23% less beef cattle, beef production is now 27% more than 1975 levels. This increase is due to an increase of 30 kg per head in carcass weight and more cull dairy cows being slaughtered.

TABLE 1: The beef cow as part of the nation's flocks and herds.

<table>
<thead>
<tr>
<th></th>
<th>1993*</th>
<th>1975 (m head)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breeding ewes</td>
<td>35.20</td>
<td>41.2</td>
</tr>
<tr>
<td>Total sheep</td>
<td>50.30</td>
<td>56.4</td>
</tr>
<tr>
<td>Breeding cows</td>
<td>1.45</td>
<td>2.31</td>
</tr>
<tr>
<td>Total beef cattle</td>
<td>4.83</td>
<td>6.29</td>
</tr>
<tr>
<td>Dairy cows</td>
<td>2.84</td>
<td>2.39</td>
</tr>
<tr>
<td>Total dairy cattle</td>
<td>3.60</td>
<td>3.00</td>
</tr>
</tbody>
</table>


TABLE 2: Livestock slaughtering for year to 30 September 1993.

<table>
<thead>
<tr>
<th></th>
<th>Head m</th>
<th>Bone in tonnes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamb</td>
<td>23.54</td>
<td>351,798</td>
</tr>
<tr>
<td>Sheep</td>
<td>6.56</td>
<td>134,493</td>
</tr>
<tr>
<td>Cattle (includes veal)</td>
<td>2.65</td>
<td>558,662</td>
</tr>
<tr>
<td>Bobby calves</td>
<td>0.788</td>
<td>13,572</td>
</tr>
</tbody>
</table>

Source New Zealand MWB Economic Service.
The dairy industry (Table 3) (Source; Department of Statistics) contributes directly to 53% of the beef produced. This includes beef animals such as Friesian bulls for bull beef and dairy beef cross livestock grown on for beef production. The further contribution of the progeny of dairy beef cross cows eg. Hereford x Friesian mated to a beef breed are included as traditional beef in these statistics. The contribution to New Zealand beef production sourced directly and indirectly from cattle of dairy origin has been estimated (NZMWB Economic Service) to be 65% of the total beef kill by weight.

**TABLE 3: Contribution to total beef kill.**

<table>
<thead>
<tr>
<th></th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional beef</td>
<td>47</td>
</tr>
<tr>
<td>Cull dairy cows</td>
<td>20</td>
</tr>
<tr>
<td>Beef of dairy origin</td>
<td>33</td>
</tr>
</tbody>
</table>

The grassland environment in New Zealand where beef cows are farmed is expected to decline in the next decade by over 700,000 hectares. Most of this land is destined for forestry (500,000 ha) and dairying (120,000 ha) (Table 4).

**TABLE 4: Landuse trends (m hectares).**

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grasslands</td>
<td>11.78</td>
<td>11.07</td>
</tr>
<tr>
<td>Dairy</td>
<td>1.46</td>
<td>1.58</td>
</tr>
<tr>
<td>Other</td>
<td>2.86</td>
<td>2.92</td>
</tr>
<tr>
<td>Horticulture</td>
<td>0.09</td>
<td>0.12</td>
</tr>
<tr>
<td>Plantation forestry</td>
<td>1.30</td>
<td>1.80</td>
</tr>
<tr>
<td>Parks, mountains, lakes</td>
<td>9.00</td>
<td>9.00</td>
</tr>
<tr>
<td>Total</td>
<td>26.49</td>
<td>26.49</td>
</tr>
</tbody>
</table>

**Distribution of beef cattle**

Beef breeding cows are farmed in every region in New Zealand (figures 1 and 2). However away from the main dairying areas of New Zealand, breeding cows make up a more significant part of the total beef herd. The regions which have 30% or more of their total beef cattle herd as breeding cows are: Northland, Tongariro, Wanganui, East Cape, Hawkes Bay, Wairarapa, Marlborough, Aorangi, and Clutha. They are characterised as the dryer and steeper or more rugged areas of New Zealand. Waikato, the largest dairying region in New Zealand, has the largest number of beef cattle yet beef cows make up only 20% of that total. Northland also has the greatest number of beef cows but they are only 30% of the total beef cattle numbers. The East Cape region has the highest breeding cow ratio with (42%). This reflects both the absence of dairying and the presence of many large extensively run farms. National beef breeding cows number (1993) were 1,450,000, with 1,105,000 in the North Island and 345,000 in the South Island. Figure 3 is a graphic illustration of how the beef breeding cow fits into the pastoral industry. Moving from East Cape where traditional beef breeds compete for land use with forestry to the Waikato where intensive beef finishing and dairying compete for land use.

**FIGURE 1:** Distribution of the New Zealand beef herd - North Island.

**FIGURE 2:** Distribution of the New Zealand beef herd - South Island.

**Role of the beef breeding cow**

The breeding cow contributes to the financial performance of farms in direct and indirect ways. They earn revenue in two direct ways. Firstly through the production of a calf and secondly, through the realisation of her own economic value when sold. Other indirect benefits relate to her complementary role, low risk and ease of management. In a survey of Waikato farmers (Parminter et al., 1993), the indirect benefits of breeding cows ranked in descending order were:

1. Complementary grazing.
2. Self replacing.
3. Maintained pasture.
4. Are a low risk, flexible enterprise with a diversity of income.
5. They are easy to manage and involve less work.

The breeding cows complementary contribution to other stock classes has recently been qualified (McCall et al., 1994). It is this ability to condition feed for other stock classes, control feed surpluses of both high and low quality and to tolerate periods of liveweight loss (Pleasants et al., 1991) that farmers consider important in the long term development and maintenance of pastures.

The number of years the breeding cow can remain productive has important implications for the number of heifer replacements required. For example almost 50% more replacements are required for a herd culled at 7.5 years compared with 10.5 years of age. On an equivalent feed demand basis the beef breeding cow is valued up to five times more than a breeding ewe. Beef breeding cows are considered to be less labour intensive than sheep. It has been estimated that beef breeding cows require around one quarter of the labour that breeding ewe requires (Webby unpublished). The beef breeding herd is an item of capital value and therefore can be considered as part of a farmer's equity. To this end some farmers use breeding cows in buffer income variation (numbers can be reduced in years of drought and increased in more favourable years) and in the longer term consider them as a source of superannuation.
Beef breeding cow policies

A wide range of beef cattle policies are available to farmers but, an all breeding cow unit is unusual. However, the total package of livestock policies must be considered and it is within this package that a particular breeding cow policy will be adopted. It is therefore not surprising that beef cow policies vary from farm to farm and from region to region. Some of the beef cow options, include breed of cow, breed of bull, calving date, mating age, culling age, weaning age, calving pattern (Thomson 1988 and 1990, McMillan and McCall 1991, McMillan 1994).

Comparisons of beef cow policies

The profitability of beef cows is as variable as the wide range of livestock policies that involve them. Equally the seasonal pattern of feed demand varies between beef cattle policies. To illustrate firstly profitability variation, the financial returns for some beef cow policy options were compared with a standard beef finishing option. Secondly the feed demand patterns were analysed for three key beef cattle policies.

Method

1. Using the same standard land area, the gross margins (returns net of the direct costs of the enterprise eg. purchases and animal health) were analysed for the following cattle policies.

   Policy 1: Traditional breed of beef cows mated to same traditional breed of bull (ie: Angus or Hereford) in a self replacing herd.

   Policy 2: Younger traditional breed of beef cow mated to traditional breed of bull (60% of herd) and terminal sires (Simmental, Charolais, Blonde d’Aquitaine etc) mated older cows, in a self replacing herd.

   Policy 3: Dairy cross cows (eg Hereford x Friesian) mated to a terminal sire breed, with heifers mated to a bull of traditional beef breeds.

   Policy 4: Purchase weaner steers at 200 kg liveweight at weaning in March and sell for slaughter at 27 to 30 months of age.

For each of the beef breeding cow options, all non pregnant cows were sold before winter. Heifers calved at 2 years of age. All steers and surplus heifer calves were sold as weaners in March. Surplus heifers were sold on local trade butchers market at 15 to 20 months. For policy 3 all calves were sold at weaning and replacement heifers purchased as weaners.

2. Using Stockpol (Marshall et al., 1991); the feed demand patterns were analysed for a standard self replacing breeding cow policy as for policy 1 above, a breeding and finishing policy with the same standard herd where all surplus progeny were sold directly for slaughter (heifers to local trade butchers at 15 to 20 months and steers for export at 27 to 30 months), and a straight finishing policy as for policy 4 above. Each policy was compared using the same pasture supply and a realistic, maximum number of stock.

RESULTS AND DISCUSSION

The difference in the gross margin from a traditional beef breed policy to a policy with dairy cross cows all mated to terminal sire breeds is $109 per hectare or an increase of 43% (table 5). The difference from the highest performing breeding cow policy to the all finishing policy is very little by comparison at $4 per hectare. Although this analysis takes into account the additional feed required by the higher performing dairy cross cows, it does not take into account, as farmers would argue, the superior ability of traditional beef breeds (eg. Angus or Hereford) to buffer themselves against periods of low nutrition and be complementary to other stock classes. However the need for this traditional role is being challenged. Lowe (1994) argues that breeding cows will no longer be complementary to other livestock systems as farms become more developed, and will be in direct competition for pastures as a feed. Indeed, breeding ewes may be viewed as being complementary to beef cows and other beef cattle systems. Therefore there remains little excuse for farmers to carry breeding cows that are anything other than high performing. Breed of cow is not necessarily the issue. The challenge is to make beef breeding cows more productive so that their many advantages can be utilised to enhance profitability rather than compromise it. Morris et al., (1994) highlight efficiencies in breeding cow management and the need to ensure high biological efficiency as well as high economic efficiency. Farmers relate good weaning weights to good cow efficiency. Farmers relate good weaning weights to good cow performance. Breed of cow is not necessarily the issue. The challenge is to make beef breeding cows more productive so that their many advantages can be utilised to enhance profitability rather than compromise it. Morris et al., (1994) highlight efficiencies in breeding cow management and the need to ensure high biological efficiency as well as high economic efficiency. Farmers relate good weaning weights to good cow performance.

2. Buy weaners finish at 27-30 months

TABLE 5: Gross margins per hectare.

<table>
<thead>
<tr>
<th>Policy</th>
<th>$/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Traditional beef</td>
<td>253</td>
</tr>
<tr>
<td>2. 60:40 traditional beef: terminal sire</td>
<td>274</td>
</tr>
<tr>
<td>3. Dairy cross 100% to terminal sire</td>
<td>362</td>
</tr>
<tr>
<td>4. Buy weaners finish at 27-30 months</td>
<td>366</td>
</tr>
</tbody>
</table>

Of the feed demand policies analysed, the sell weaners policy best represents the seasonal feed demand profile of the beef cow unit.
beef breeding cow (figure 4). This profile with a low winter feed demand and a high spring summer feed demand is one that best matches feed supply. By comparison, the finishing and breeding policy is half way between the sell weaners and all finishing policy. The policy with the highest winter and the lowest in spring - summer feed demand, the worst fit to feed supply, is the all finishing (buy and finish).

**FIGURE 4:** Feed demand profile for varying beef cattle policies.

This complementary match of the feed demand of a breeding cow herd with typical New Zealand seasonal pasture supply patterns is a key factor in the cows complementary role with other on farm livestock policies (such as beef cattle finishing) (McCall et al., 1994) and feed buffering ability. Towards this end the timing of calving, and the pattern of calving determines just how compatible an individual policy is with feed supply and is a management option farmers can use to align feed supply at calving.

In a move to more profitable livestock systems such as beef finishing, farmers may overlook the complementary role of the beef breeding cow. Webby (1993) showed that moves by farmers from dominantly sheep to dominantly finishing cattle required an increase in breeding cows to maintain a manageable feed supply: feed demand relationship.

**SUMMARY**

The beef breeding cow can maintain her role in a mixed livestock production system provided she can compete on an economic basis for marginal winter feed. Her traditional roles are challenged but there are still no alternatives to buffer extensive or low input farm management. The beef breeding cow is part of a mixed livestock production industry that must maintain its economic viability or be taken over by other forms of land use such as forestry or dairying.

**REFERENCES**


