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# BULL BEEF PRODUCTION

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Abstract

The development of a 74 hectare bull beef production system is outlined. With pasture development regarded as a high priority techniques used to apply sufficient grazing pressure to change pasture composition are discussed. The combination of stock classes and pasture management changes has allowed a dramatic increase in the proportion of ryegrass and white clover in the sward.

Currently a slightly modified one year bull beef system is being operated. Spring calves (140) are farmed through to 16-18 months of age and in addition autumn reared calves (60) are taken through to slaughter at 19-20 months. Performance and management objectives are given for this production system and the key factors relating to their practical implementation are discussed.

## INTRODUCTION

Faced with the chance to purchase a 74 hectare block of land 16 km away from our dairy farm led to consideration of the options available to improve our farming enterprise. What management options are available, what alternatives will be profitable, which ones will be workable? A lifelong background in intensive dairying logically led to thoughts of pasture based systems. Winter grazing for the milking herd, grazing of heifer replacements with the balance taken up with bull beef production seemed the logical land use.

Looking around for data on bull beef production systems revealed little available detailed information. So like others faced with the same question the principles and practice learnt in dairying were transposed to the bull beef system. Like other dairy farmers the stocking rate chosen was too high, animals were grazed too hard and liveweight gain was too low. The last four years have shown bulls to be a challenge but that the interaction between pastures, animal intake, animal performance and profitability are not the same as for dairy cows. A whole new set of management objectives and management philosophy has evolved.

In this paper I intend to briefly cover how far I have come in bull beef production in these four years, what my current management objectives are and give a few thoughts as to future developments.

## BACKGROUND

Prior to purchase the bull beef unit had been farmed as a leased cropping proposition. The standard of improvements, fertility and drainage were less than desirable. Pasture composition was predominantly browntop. Ragwort was the only weed problem. During the first twelve months the following improvements were made:

- A ring race was constructed.
- Re-fenced and subdivided into forty-six, 1.6 hectare paddocks.
- A new water reticulation system installed.
- Stock yards and weighing facility constructed.
- All wet areas tiled and mole drained (⅓ of farm).
- 900kg superphosphate applied per hectare.

In other words the traditional elements of a development programme were put in place.

Pasture development was regarded as a high priority. To apply sufficient grazing pressure to change the pasture composition it was thought necessary to use dry dairy cows in the winter months and have some bulls autumn reared. Autumn bulls allowed for reduced weight gains without sacrificing liveweight targets.

The following changes have been made to improve pasture composition:

- Sixteen hectares block grazed each winter with dairy cows at high grazing intensities and high levels of hay supplement.
- A change from set-stocking to rotational grazing over the spring.
- Preventing pasture surpluses developing in the late spring/early summer.
- Six (6) paddocks have been sprayed and direct drilled with either Nui ryegrass, Wana cocksfoot or Maru phalaris.
- A combination of 40% Autumn • 60% Spring born bulls has been used.
- Continued fertilizer application. Phosphate levels (Olsen P) 8-l 1 in 1982, to 25-36 in 1986.

The combination of stock classes and pasture management changes has allowed pressure to be put on browntop at critical periods (winter/late spring) and whenever possible to encourage ryegrass and white clover (in particular in the autumn, late winter and early spring). The change has been so dramatic that no further regrassing is likely at this stage. It has also been concluded that conditions on the farm are not extreme enough to warrant the introduction of Wana cocksfoot or Maru phalaris.

In 1987 no dairy cows were wintered and in recent years it has been more economic to graze replacement heifers off the farm. A positive decision has now been made to separate the bull beef and dairy systems. As a support unit for the dairy unit the returns cannot compete with bull beef — the old story of a run-off being a poor investment!

## CURRENT BULL BEEF POLICY

The present farming system (Table 1, Figure 1) is a slightly modified one year bull-beef system. Spring calves are farmed through to 16 to 18 months and in addition autumn reared calves are farmed until slaughter at 19 to 20 months.

Performance levels in the spring calves have almost reached the target weight at the end of November suggested by Morris and McRae (1985) (Figure 1). It appears, however, that there is a greater reliance on a late run in the spring to obtain target weights. This is despite higher than target liveweights in the autumn. As a result of this observation target weight gains over the winter months have been increased from 0.3 to 0.5 kg per head per day leading to average weights above target on 1 August 1987 (Figure 1). It is apparent that at a stocking rate of 3.0 bulls per hectare these target weights are obtainable. This supports the observation of Morris and McCrae (1985).

Autumn bulls are farmed as they allow flexibility. They can, at times, be treated as low priority stock yet still reach killable weights in October and November. It is important to have the flexibility of killing stock in the late spring to enable the remaining one year bulls to reach target weight'without any detrimental effects on the young calves. Autumn bulls have at this stage been preferred to a class of two year bulls due to their lower winter feed requirements.

Can you imagine feeding milking cows in order to produce 1 kg milkfat per cow per day every day of the year? Impossible? This is what we are attempting to do in a one year bull beef system. The bulls must grow on average almost 1 kg liveweight per day every day we are farming them. To my mind this performance level brings with it the herbage allocation, pasture quality and grazing pressure requirements similar to our 1 kg milkfat per day cow. Figure 2 outlines the pertinent features of the overall and seasonal management of the bull unit.

## WHERE TO NOW?

I am still learning about bull beef production and as yet some of the objectives previously outlined have not been met.

It is still possible to increase killing weights. More critical attention must be placed on weaner calves; their age, weight and breed. We should be starting with a 100 kg liveweight

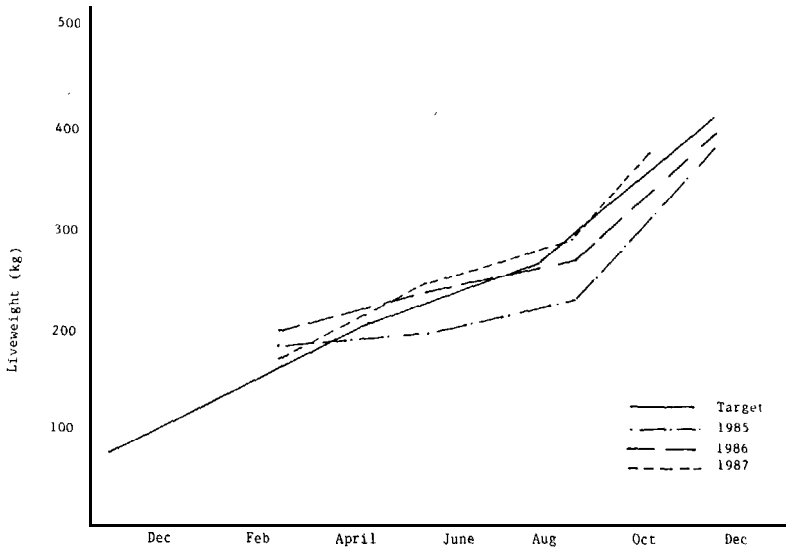


Figure 1: Liveweight (kg) of spring bulls relative to published targets (Morris and McRae 1965)

Table 1: Farm statistics

| DAIRY FARM — 66 hectares. Ruawhata Road. Pahiatua | | | | |
|---|---|---|---|---|
| Year | Cows milked | Total Milkfat (kg) | Milkfat/cow (kg) | Milkfat/ha (kg) |
| 1983/84 | 273 | 40,000 | 147 | 568 |
| 1984/85 | 275 | 36,000 | 136 | 559 |
| 1985/87 | 256 | 44,700 | 173 | 657 |
| 1986/87 | 262 | 35.000 | 134 | 515 |

| BEEF UNIT- 74 hectares. Bluff Road, Woodville | | | | |
|---|---|---|---|---|
| Year | Bulls Sold (works) | Bulls Sold (store) | Heifers grazed | Average carcass weight (kg) |
| 1984/85 | 122 | 24 | 60 | 225 |
| 1985/86 | 170 | 0 | 60 | 248 |
| 1986/87 | 177 | 18 | 0 | 229 |

weaner on 1 November.. Individual bulls don't all respond the same. The distribution of liveweights on 22 July 1987 are presented in Figure 3. There is a need to establish why. Is it possible to get improved calf identification and therefore be able to target high growth performance bulls in the Dairy Board team?

The bull system developed on this farm can be regarded as an efficient one year bull beef production system. To meet animal performance requirements, however, the amount of pasture harvested per hectare is low. Massey University students' estimates for feed harvested per hectare ranged from 7500 to 9000 kg $DM.ha^{-1}$ on the bull beef unit. A similar exercise on the dairy farm suggested in excess of 15,000 kg DM. $ha^{-1}$ was being harvested. Can we find ways of increasing utilisation from a bull system or is it a cost we must live with?

## AUTUMN

| | |
|---|---|
| OBJECTIVES | • To set farm up for winter.<br>• Average cover target at start of the winter not more than 1800 kg DM. $ha^{-1}$ or less than 1600 kg DM. $ha^{-1}$. |
| POTENTIAL WEIGHT GAIN | • Autumn (R 1yr) Bulls — 1.5 kg per head per day.<br>• Spring Calves — 1.0 kg per head per day. |
| ACTUAL WEIGHT GAINS | • Autumn bulls — 0.75 to 0.9 kg per head per day.<br>• Spring calves — 0.75 to 1.0 kg per head per day. |
| PRIORITY STOCK | • Spring calves. |
| PASTURE COVER | • Average cover at end of autumn 1600-1800 kg DM. $ha^{-1}$. |
| GRAZING MANAGEMENT | • No benefit in increasing cover further. Put extra weight on the bulls.<br>• Quality no problem.<br>• Gradually lengthen rotation over Autumn<br>Late April — 40 days<br>Mid May — 55 to 60 days (winter rotation)<br>• Lengthening rotation probably at the cost of liveweight gain. Autumn bulls if necessary reduced to maintenance in dry autumns. |

## SUMMER

| | |
|---|---|
| OBJECTIVES | • Fully feed spring calves.<br>• Reach target weight on all remaining one year bulls without any detrimental affect on young spring calves.<br>• Clean-up all pastures so growth potential is high over the autumn/winter period. |
| POTENTIAL WEIGHT GAIN | • Spring calves 0.75 kg per head per day<br>• Autumn calves 1.5 kg per head per day<br>• Older bulls 1.5 kg per head per day |
| ACTUAL WEIGHT GAIN | • Spring calves 0.75 kg per head per day<br>• Autumn calves 0.5 to 0.75 kg per head per day |
| PRIORITY STOCK | • Spring calves > older bulls > autumn calves. |
| PASTURE COVER | • No targets. |
| GRAZING MANAGEMENT | • Grazing rotation 25-30 days for all classes of stock.<br>• Spring calves given preference of high quality feed. Often grazed out of sequence with lower priority stock.<br>• Sell killable bulls to ensure other stock are meeting targets.<br>• In a dry summer, sell all older bulls regardless of weight. More flexible if liveweight targets have been achieved.<br>• Ensure no health problems in spring calves. Rigid drenching programme. If you observe clinical worm problem then have already suffered 2 to 3 weeks nil weight gain.<br>• Need a low priority animal at this stage otherwise decrease liveweight gain in spring calves. |

## MANAGEMENT OBJECTIVES

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| TARGET WEIGHTS | • All Autumn bulls should reach a minimum of 225 kg carcass weight by late November.<br>• Thirty percent of Spring bulls to reach this target by the end of December.<br>• This allows up to 60% of all one year bulls to be slaughtered by the end of December. |
| MOB SIZE | • Currently mob size has been restricted to 50 to 70 animals.<br>• Spring bulls are sorted on liveweight in early autumn into two mobs. They remain in these mobs until slaughter. |
| SUPPLEMENTS | • I consider it unprofitable to feed supplements to bulls. Only a minimum amount is made and fed out (4 bales hay per bull wintered). |
| WEIGHING | • Weighing is now done on a monthly basis from February onwards. |
| ANIMAL HEALTH | • A rigid drenching programme must be undertaken. All bulls are drenched monthly from weaners to 11 months of age. Reduced weight gains due to worm burdens are expensive.<br>• Bloat has not been a problem. Over the spring all bulls are fully fed to gain 1.5 kg per head per day plus.<br>• Ryegrass staggers has caused low weight gains and the odd death on electric fences.<br>• Stock losses are 2%. |
| PASTURE MANAGEMENT | • Pasture cover is regularly assessed over the autumn/winter/spring period.<br>• Calculations of animal intake are made to confirm expected weight gains.<br>• Intake is determined by manipulation of average pasture cover, stocking rate, class of stock and pasture quality (see seasonal outlines). |

Figure 2: Management objectives

## WINTER

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| OBJECTIVES | • To try and lift weight gain over winter from 0.3 to 0.5 kg per head per day on all classes of one year bulls.<br>• To use minimal supplements. Only to feed supplements in adverse seasons. |
| POTENTIAL WEIGHT GAIN | • 1.00 kg per head per day (not realistic) |
| TARGET WEIGHT GAIN | • 0.50 kg per head per day. |
| ACTUAL WEIGHT GAIN | • 0.30 kg per head per day. This year the highest target has been achieved over June and July. |
| PRIORITY STOCK | • None. All fed to achieve similar weight gains. |
| PASTURE COVER | • Average cover at start of winter 1600-1800 kg DM. $ha^{-1}$.<br>• Average cover at end of winter 1300-1400 kg DM. $ha^{-1}$. |
| GRAZING MANAGEMENT | • Residual DM after grazing in the later winter down to 900-1000 kg DM. $ha^{-1}$ to ensure high quality spring feed.<br>• To maintain feeding levels and allow for gradual decrease in cover rotation length around 55-60 days. Rotation gradually reduced through August to 20 days (early September).<br>• Once conditions become wet all mobs shifted daily. In extreme conditions bulls stood-off on races. |

## SPRING

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| OBJECTIVES | • To make maximum use of the high weight gain potential over this period by high intakes of high quality pasture.<br>• To have bulls at target weight early enough to prevent pressure on young spring calves.<br>• All autumn bulls saleable in the late Spring.<br>• To benefit from any early season premiums offered by Meat Companies. |
| POTENTIAL WEIGHT GAIN | • 2.0 kg per head per day in 1 year bulls<br>• 0.75 kg per head per day in autumn calves. |
| TARGET WEIGHT GAIN | • As high as possible. |
| ACTUAL WEIGHT GAIN | • Three month average in one year bulls 1.5 kg per head per day. |
| PRIORITY STOCK | • NONE. Potential for liveweight gain is too high. You can't afford to restrict intake. |
| PASTURE COVER | • Hold in the 1500-1700 kg DM. $ha^{-1}$ range. |
| PASTURE QUALITY | • This is of high priority. IF QUALITY FALLS, INTAKE FALLS, LIVEWEIGHT GAIN FALLS.<br>• Quality aided by low average cover and high quality pasture at the end of winter.<br>• Supplements. Small amount of hay conserved if average cover is above 1700 kg DM. $ha^{-1}$. Maximum of 1000 bales of hay. In an exceptional spring could take 5 to 6 paddocks silage.<br>• Mechanical Control. All farm receives one strategic topping. Cut as low as possible preferably behind the bulls. Don't top too early or will need second mowing. |

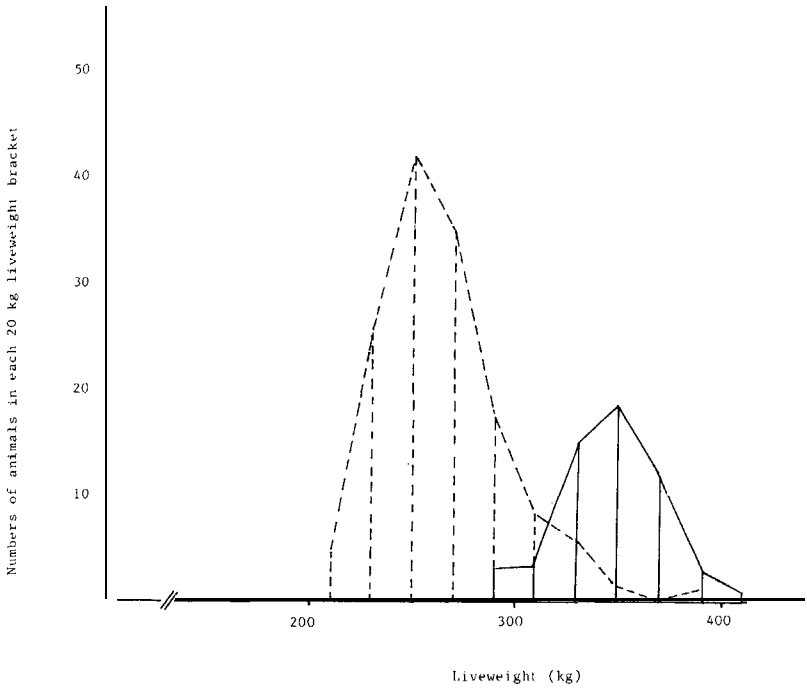


Figure 3: Liveweight range of Autumn (-) and Spring (---) bulls on 22 July 1987

Brougham **(1975)** harvested up to 13,788 kg $DM.ha^{-1}$ under intensive bull beef production at high stocking rates. The weight gains achieved and the final target weight obtained under high stocking rates are unacceptable from a beef production/marketing point of view. On the other hand if higher rates of gain/target weights are required there will be a corresponding reduction in the stocking rate carried and the amount of herbage harvested per hectare.

Future challenges must be related to increasing the efficiency of bull beef systems while at the same time maintaining liveweight gains and liveweight targets. The simple one year bull production system may not be the ideal. Other classes of stock may need to be introduced to provide a low priority animal to harvest pasture at present being recycled as organic matter. Such a class of stock would increase the requirements for supplements over the winter period unless a buying and selling policy is adopted. Perhaps the autumn bulls are already partly filling this role.

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