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BULL BEEF PRODUCTION: THE 'TUAPAKA' EXPERIENCE

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Abstract

A bull-beef system based on buying 8 week old replacement calves and selling bulls at 15-20 months of age was set up prior to the winter of 1983. A commercial venture, it was set up to provide information on calf-to-ZO-month bull beef systems.

Average carcass weights CW at slaughter have been 212 kg, 231 kg, 237 kg and 208 kg for the four seasons reported. The margin per ha. (sales less replacement costs) in each of those years has been $798, $1380, $875, and $720 respectively.

Data collected regularly on average pasture cover and animal liveweight are used to allow management to respond appropriately lo climatic variability, especially through the autumn and winter, and ensure that liveweight (LW) targets are met before summer dry spells.

Keywords: pasture cover, target liveweights, profitability

INTRODUCTION

A bull-beef system based on the purchase of 8-12 week old replacement calves in November and selling 15-20 month old bulls the following year was set up on a Massey University farm, 'Tuapaka', prior to the winter of 1983. Increasingly, it seemed at this time, farmers were adopting systems where bulls not ready for slaughter at 20 months of age were wintered a second time, or systems that were based on low winter stocking rates and the need to buy extra animals in the spring. Analyses carried out at Massey University indicated that the calf-to-20-month system was at least as profitable as any other and it had the further advantages of neither running heavy 2 year old cattle through the winter nor having to rely on the purchase of stock from the store market. (Morris and McRae 1984).

The unit was set up as a commercial venture with the primary objective of providing information on and experience with calf-to-20-month bull-beef systems.

This paper briefly describes the unit; the targets set and information gathered on the unit are outlined; and the results achieved over four seasons are reported and discussed in terms of what has been learnt about this particular system.

THE FARM

The farm, 16 km NE of the Massey University Campus is 103 ha (effective), flat except for 10 ha of steep gullies, subdivided into 30 paddocks (1.5 ha to 5 ha) and well serviced by grass lanes and tracks. All fences are electrified.

The soil is a heavy clay with poor internal drainage and despite extensive tile and mole drainage can become very wet in winter.

The farm receives approximately 1000 mm of rain p.a. This is usually evenly spread but summer dry spells and strong Wand SE winds can severely reduce summer pasture growth.

TARGETS

The calves are purchased onto the farm in early November at an average liveweight (LW) of 80 kg. The expected average daily liveweight gain (LWG) and resultant average LWs are presented in Table 1.

Table 1: Target liveweights (LW) and Liveweight gains (LWG)

	1st Nov	1st May	15th Aug	30th Nov
LW (kg)	80	200	250	400
LWG (kg/day)	0.7	0.5	1.5	

Where the average LW is 400 kg by the end of November 15% of the herd can be expected to be heavier than 440 kg LW and then available for slaughter above 220 kg carcass weight (CW). LWG achieved after November and average carcass weight at slaughter for the whole herd is dependent on summer pasture growth as the older animals are slaughtered at a rate that allows the feed supply to meet the feed requirements of replacement calves. Whatever the slaughter pattern all the older animals are off the unit before May.

The average pasture cover (kg DM/ha) on the farm at any time is determined by the balance between pasture growth rates and feed consumption (animal intakes X no. of animals) in the period prior to that time and the average cover at the start of that period. Over the summer then, as discussed above, feed consumption is reduced as necessary by slaughtering the older animals. By winter however the number of animals on the unit is fixed (by the number of replacements purchased) at the winter stocking rate of around 3.4 yearling bulls/ha. Where the intake of these animals is restricted (by rotational grazing) so that their LWG is 0.5 kg/day, feed consumption will exceed the feed supplied by expected winter pasture growth rates. In this situation a feed bank of 1500 kg DM/ha is taken into the winter and this is reduced to an average cover of 1100 kg DM/ha by the end of the winter. Where average pasture cover falls below this level in late winter, pasture growth rates and animal intakes can be markedly reduced.

In the spring, pasture growth rates are expected to exceed feed consumption even after stock numbers are doubled when replacements are purchased and intakes are at a maximum. The amount of hay and silage made to utilize surplus feed and maintain pasture quality depends on pasture growth rates in the spring.

INFORMATION COLLECTED

The average pasture cover (kg DM/ha) is measured in each paddock every two weeks using an "Ellinbank" rising plate meter. The data are collected in less than 1% hours and are stored and analysed in a data-base programme on a micro-computer. Once in this form the changes in average cover over the whole farm and any individual paddocks can be readily calculated. The average pasture *covers* on the farm are presented in Figure 1.

Pasture growth rates can be estimated by taking the changes in average cover on the paddocks ungrazed since the last reading; or by calculating feed consumption over the period (from LW and LWG data) and adding this to the change in average pasture cover over the whole farm.

Animals are individually ear-tagged and weighed, on average, monthly. A small battery operated field computer linked to the electronic scales allows individual LWGs to be calculated at weighing along with the average LW and LWG of the herd and groups within the herd. The herd average LW is presented in Figure 2.

FOUR YEARS' EXPERIENCE

The number of replacement calves purchased each year and the average CW at slaughter are presented in Table 2.

Table 2: Stock numbers and carcass weight (CW) at slaughter

No. of calves	Bought in November	Slaughtered over summer	Average CW at slaughter (kg)
377	1962	1983/84	212
330	1983	184/85	231
340	1984	1985/86	237
355	1985	1986/87	208

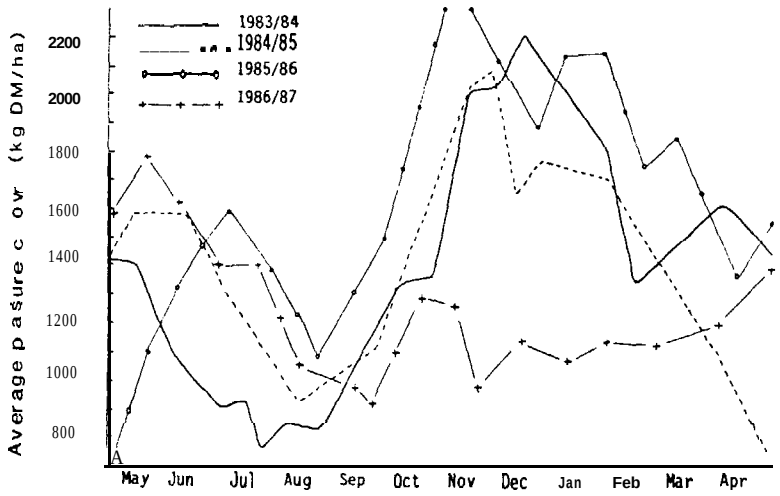

Figure 1: Tuapaka Bull Beef Unit — average pasture cover on the farm (kg DM/ha).

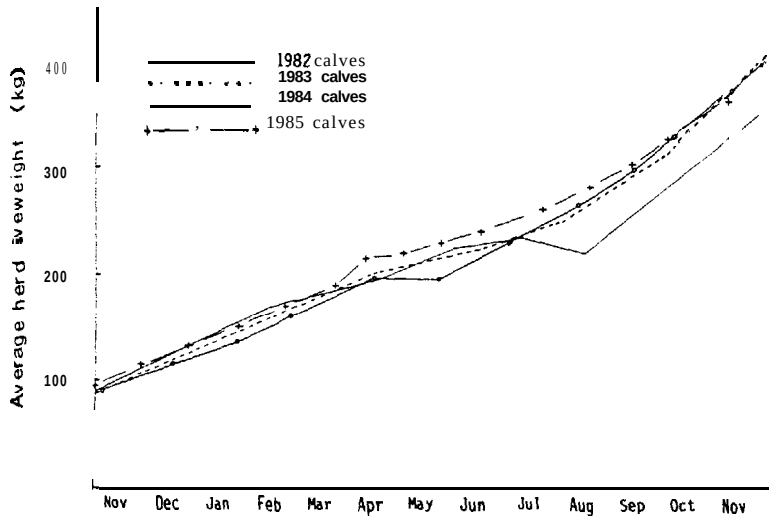

Figure 2: Tuapaka Bull Beef Unit — average liveweight (LW) of the herd

The low carcass weight at slaughter in 1983/84 can be attributed to events in the winter Of 1983. Projections carried out before the system was set up indicated that 377 yearling bulls could be wintered and the targets outlined in Table 1 would still be met. Furthermore it was believed that little effort had to be made to restrict animal intakes over winter since a period, in late winter, where low average pasture covers would lead to low daily intakes and LWG would simply be balanced out by the higher daily intakes and LWGs achieved earlier in the winter. However, the combined effect of the higher stocking rate in that first winter and lack of intake control caused pasture cover to fall rapidly (see May/June 1983 in Figure 1) through to July when a spell of cold weather forced pasture cover down to critically low levels (below 800 kg DM/ha). The animals lost some weight (see 1982 calves in Figure 2) and while hay feeding and N fertilizer were used to alleviate the problems the animals never reached their November target LW and were slaughtered at an average carcass weight of 212 kg (Table 2).

The low average CW at slaughter in 1986/87 (Table 2) is the result of quite different circumstances *and management* response. The calves entered winter (1985 calves in Figure 2) at heavier weights than any other year. Favourable autumn growth allowed calf intakes and hence LWG to remain high while average pasture cover also built up (see April/May 1986 in Figure 1). A prolonged wet spell through June 1986 resulted in animals being shifted frequently to avoid pugging and pasture damage, hence intakes were not restricted and average pasture cover fell to 1400 kg DM/ha by the end of June. Soi temperature had also dropped by this time and general conditions for pasture growth were poor. Poor regrowth was confirmed by the pasture cover figures and to continue to feed animals at intakes supporting even 0.5 kg/ha/day LWG would have quickly reduced average pasture cover to below 1000 kg DM/ha. In response to this situation animals were taken off pasture and fed hay ad *lib* on three "dry" standing sites. When the animals returned to pasture in late July the pasture data continued to confirm the need for restricting animal intakes and this was done within the limits set by wet soil conditions. Prolonged cold and wet weather finally caused pasture cover to fall below the preferred target of 1100 kg DM/ha and through the critical 1000 kg DM/ha (September 1986 in Figure 1). Thus, a climatic situation that could have led to severe feed shortages in July with the subsequent need to sell animals on a depressed store market or buy large quantities of (by that time) expensive hay had been avoided. In September (see 1985 calves in Figure 2) the animals remained on target LW. A very wet Ocober followed by a prolonged dry spell from November through to January meant that there was only a short period when pasture growth exceeded feed consumption (see October 1986 in Figure 1). To ensure the replacement calves met their target LWG the older animals were slaughtered early and at lower carcass weights (208 kg in Table 2).

PROFITABILITY

The margin between average sale price and average replacement cost within a financial year multiplied by the number of animals wintered is the major component of annual profit.

This margin is calculated on a per ha basis for each of the four seasons and presented in Table 3. Planning prior to setting up the system indicated that this margin should be around $1000/ha where the LW targets outlined earlier are met.

In 1983/84 the performance lost during the winter (discussed earlier) reduced slaughter weights and hence profit. In 1984/85 the expected profit was considerably exceeded. This was largely due to the increases in the schedule price paid which occurred after the replacements were purchased, in November. In 1985/86 the carcass weight at slaughter averged 237 kg per head but the price received was only $1.88/kg CW. Approximately 40% of the sales, that year, were made at around $2.25/kg CW with the remainder sold at $1.60/kg CW afler a major industrial dispute had closed the processing plants for six weeks through the summer.

As discussed above an early summer drought in 1986/87 reduced average CW to 208 kg at slaughter. This drought occurred after the replacements had been purchased. Expected spring summer pasture growth rates would have produced average CWs at slaughter of around 230 kg. On this basis then the drought reduced the margin/ha (as presented in Table 3) by $150.

Table 3: Profit 'margin' achieved on 'Tuapaka' bull beef unit. based on 103 ha

Year of Slaughter	Carcass weight at Slaughter (kg)	Price/kg Carcass weight ($ net)	Av. Price/ Head $	Replacement cost $	Margin/ Head $	NO. Wintered	Margin Per ha
1983/84	212	1.67	353	135	216	377	$ 796
1984/85	231	2.64	610	179	431	330	$ 1360
1985/86	237	1.88	445	160	265	340	$ 975
1986/87	208	1.93	401	192	209	355	$ 720

CONCLUSIONS

Bull-beef production based on calf-to-20-month systems can be successful both technically and economically on the class of country described.

The target weights for replacement calves can be met through dry summers where the older cattle are slaughtered early enough to reduce feed consumption. Having the flexibility to slaughter these animals when required in turn depends on earlier target weights being met.

Winter performance is largely determined by stocking rate but for a given stocking rate the extent to which animal intakes are controlled in response to unpredictable pasture growth conditions is a key factor in coping successfully with climatic variability in winter.

The gathering and use of simple pasture and animal data as described here provide support for tactical management decisions. These data will now also allow important strategic decisions like stocking rate to be objectively re-evaluated with increased confidence.

References

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