Cull dairy cows as a flexible tool for pasture control on East Coast hill country

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Abstract

On East Coast hill country, climate change and variable pasture growth mean that there is an opportunity for a more flexible cattle system than the traditional beef cow. Cull dairy cows were purchased in autumn/winter across 3 years and several properties and used to clean up low quality winter feed (8.3 MJME/kg DM; crude protein content, 10.7%). In spite of the low quality feed on offer, winter liveweight gains averaged 238 g/day. Cows were set stocked over spring and growth rates averaged 749 g/day. Cows were slaughtered/sold when the spring/summer "clean-up" had been completed. Across three quite different years, cows were typically farmed for 34 weeks, put on an average of 115.3 kg and had estimated returns of 14.1 c/kg DM consumed. Variation in purchase price, weight gain and timing of slaughter resulted in returns ranging from 8.7 to 28.1 cents/kg DM consumed. These calculated returns do not include the effects of removing low quality feed on other farm enterprises.

Keywords: cull dairy cows, pasture management, flexibility, gross margin, East Coast dryland, hill country

Key messages

- Cull dry dairy cows provide a flexible pasture management tool. They can be purchased in autumn on a low beef schedule and used to control spring and summer feed surpluses
- Profitability varies according to buy and sell price and growth rates achieved, but averaged 14.1 cents/kg DM consumed in this study
- Cows need to be pregnancy tested on arrival to ensure they are not in-calf. They are usually in poor condition and need to be fed well for the first few weeks and gradually transitioned to hill country.

Introduction

On many sheep/beef farms the beef cow fulfils an important role in maintaining pasture quality for other stock classes. However, climate change and increasingly variable pasture growth on East Coast hill farms has resulted in a need for more flexible beef systems that can carry out a similar role to the traditional beef cow. Cull cows from the dairy industry have the potential to fill this role on drought-prone East Coast hill country. They are available in large numbers in early winter and can be purchased when prices are low. They can be wintered on low quality pasture, used to control surplus spring pasture and slaughtered on a higher schedule. The performance and returns from cull cows on hill country were examined across several farms and years.

Methods and Analysis

Data were collected on cull dairy cows farmed on one property in 2009 and on three properties in each of 2012 and 2014. On two of the properties, data collection was repeated in different years meaning five different properties were involved (Table 1). Cows were purchased across a range of dates, weights (Table 1) and breeds. Within a week of arrival, cows were weighed and pregnancy tested and pregnant cows slaughtered, with little or no loss of value. Data were available on 52, 159 and 81 cows in 2009, 2012 and 2014, respectively. Cows were re-weighed at the end of winter and again pre-slaughter. Pasture samples were collected for botanical dissection and NIR analysis (Table 2) at approximately monthly intervals during winter on all farms during 2012 and 2014. On Farm 1/09, cows were run as a separate mob and then set-stocked with ewes and lambs during winter. On Farms 1/12 and 2/12, cows were run as a separate mob through winter and spring. On Farm 3/12, cull cows were wintered with beef cows and then set-stocked with ewes throughout lambing. In 2014, cull cows were used as a separate mob to clean

Table 1 Liveweight and purchase date of cull cows farmed across seven properties.

Year	Farm	Date	LW[1] (kg)
2009	1/09†	15/4/2009	380
2012	1/12	30/5/2012	442
	2/12‡	17/5/2012	443
	3/12†	18/6/2012	431
2014	1/14	21/6/2014	445
	2/14‡	29/7/2014	389
	3/14	13/5/2014	437
Mean		27/5/2014	424

[1]Liveweights (unfasted) recorded within a few days of arrival
†‡ Farms with the same symbol were used in different years

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up rough winter feed and were kept as separate mobs throughout spring. In all cases, their role was to control spring feed surpluses.

Dressing out % (DO%) was calculated from pre-slaughter liveweight (collected on farm) and carcass weight. On Farm 1/12, cows were on-sold to another farmer and on Farm 3/14, they were sold at a stock sale. For these farms, carcass weights were calculated using the average DO% obtained from the other five farms.

Samples of the winter feed on offer were taken by cutting to a residual of approximately 500 kg DM/ha on all properties in 2012 and 2014. Samples were dissected into ryegrass, other grasses, dead matter, legumes and weeds. Subsamples were submitted to Lincoln University for NIR analysis for metabolisable energy (ME) and protein (Table 2). The estimated intakes were

Table 2 Feed quality of winter pasture on offer – botanical dissections (% of DM) and NIR results.

Year	Farm	Dead %	Legume %	Weed %	Ryegrass %	Other %	MJME (MJME/kg DM)	Protein %
2012	1/12	59	1	0	16	24	8.6	10.3
	2/12	58	1	1	36	4	8.0	7.9
	3/12	58	1	5	12	34	8.7	10.9
	Mean	58	1	2	21	18	8.4	9.7
2014	1/14	58	3	1	18	20	8.5	10.8
	2/14	38	0	3	29	30	8.8	13.0
	3/14	50	0	0	22	28	7.6	11.3
	Mean	49	1	1	23	26	8.3	11.7

Table 3 Liveweight and growth rate of cull cows farmed on seven properties.

		Farm			
Year		**1**	**2**	**3**	**Mean**
2009	Purchase LW (kg)	380			380
	End winter LW (kg)	431			431
	Pre- slaughter LW (kg)	599			599
	Total weight gain (kg)	219			219
	Winter growth rate (g/d)	291			291
	Spring growth rate (g/d)	945			945
	Autumn growth rate (g/d)	578			578
	Overall growth rate (g/d)	550			550
2012	Purchase LW (kg)	442	443	431	438
	End winter LW (kg)	455	456	442	451
	Pre- slaughter LW (kg)	512	525	494	510
	Total weight gain (kg)	70	82	63	71
	Winter growth rate (g/d)	110	123	198	144
	Spring growth rate (g/d)	687	966	493	715
	Overall growth rate (g/d)	309	625	305	413
2014	Purchase LW (kg)	445	389	437	423
	End winter LW (kg)	483	417	464	455
	Slaughter LW (kg)	597	521	531	550
	Total weight gain (kg)	152	133	94	126
	Winter growth rate (g/d)	431	475	265	390
	Spring growth rate (g/d)	802	569	697	689
	Overall growth rate (g/d)	633	611	462	569

calculated for each season using the ME requirements of Nicol & Brookes (2007) and the estimated ME of the pasture eaten.

Results and Discussion

In 2009, cows were initially grazed in easier contoured paddocks with some steep sidings. Covers were around 3000 kg DM/ha and as covers declined, cows were able to move onto the steeper areas within the same paddock. Thereafter, cows were set-stocked on hill paddocks with covers of around 1500 kg DM/ha. In 2012 and 2014, cows were used in a winter clean-up role on all farms. Summer feed surpluses meant that initial covers were typically around 4000 kg DM/ha, declining to around 1500 kg DM/ha in mid-August. In both years, winter pastures on offer were typically unimproved species with only 12-36% ryegrass and the rest predominantly danthonia and browntop, and between 49 and 60% dead material (Table 2). Pastures were of poor quality with average ME levels of 8.4 and 8.3 MJME/kg DM and 9.7% and 11.7% crude protein for 2012 and 2014, respectively (Table 2).

During winter, cows grew at an average of 291 g/d, 144 g/d and 390 g/d in 2009, 2012 and 2014, respectively (Table 3). The end of winter weight was taken later in 2009 and 2014 than in 2012, thus winter growth rates in these years are likely to have included some of the "spring" growth component. During spring, cows were set-stocked and liveweight gains averaged 945, 715 and 689 g/head/day in 2009, 2012 and 2014, respectively (Table 3). A wet summer in 2009 meant that cows were retained until autumn to clean up surplus feed and increased in liveweight by an average of 219 kg. In 2012, cows only increased by 71kg (Table 3) as the East Coast experienced a dry spring with the Poukawa Research Farm only recording 87 mm of rain between the 1st August and 31st December. These dry conditions meant that on Farms 2/12 and 3/12, there was no surplus spring feed and pasture covers declined to 1000 kg DM/ha and cows were slaughtered in November - much earlier than planned. Farm 1/12 had feed available until mid-January when the cows were on-sold to another farmer. The final year of the study (2014) was a more typical year and cows increased in liveweight by an average of 126 kg (Table 3).

In 2009, cows averaged 380 kg at time of purchase at a cost of $1.12/kg liveweight (inclusive of transport). In 2012, cows averaged 438 kg ($1.33/kg liveweight) whilst in 2014, purchase liveweights averaged 423 kg ($1.57/kg liveweight; Table 5). Increases in purchase price between years reflected higher export prices and competition from meat processors for cull dairy cows.

Table 4 Estimated returns for cull cows across seven properties.

		Farm			
Year		**1**	**2**	**3**	**Mean**
2009	Purchase date	15/4/2009			15/4/2009
	Total purchase price ($/kg)	1.12			1.12
	Sale date	14/5/2010			14/5/2010
	Net sale price ($/kg LW)	1.49			1.49
	Feed consumed (kg)**	3031			3031
	Returns c/kg DM	13.4			13.4
2012	Purchase date	30/5/2012	17/5/2012	18/6/2012	1/6/2012
	Total purchase price ($/kg)	1.26	1.32	1.40	1.33
	Sale date	14/1/2013	12/11/2012	28/11/2012	8/12/2012
	Net sale price ($/kg LW)	1.39	1.43	1.42	1.41
	Feed consumed (kg)**	1587	1349	1131	1356
	Returns c/kg DM	9.8	12.2	8.7	10.2
2014	Purchase date	21/6/2014	29/7/2014	13/5/2014	20/6/2014
	Total purchase price ($/kg)	1.56	1.67	1.47	1.57
	Sale date	7/2/2015	6/2/2015	5/12/2014	16/1/2015
	Net sale price ($/kg)	1.50	1.69	1.91	1.69
	Feed consumed (kg)**	1792	1516	1399	1569
	Returns (c/kg DM consumed)	11.1	15.3	28.1	18.2

**Assumes average pasture consumed over winter has an ME of 9 MJ/kg DM and that consumed over spring/summer has an ME of 11 MJ/kg DM

At slaughter, cow liveweights averaged 598 kg, 510 kg and 550 kg in 2009, 2012 and 2014, respectively. The average carcass weights were 292.9, 215.9 and 227.0 kg and dressing out percentages were 43.9%, 42.4% and 41.4% for 2009, 2012 and 2014 respectively (Table 4). After deducting slaughter levies, per kg carcass returns averaged $2.85 or $1.39/kg liveweight in 2009, $3.34 or $1.41/kg liveweight in 2012 and $4.06 or $1.70/kg liveweight in 2014 (Table 5).

Although average winter feed quality was 8.3-8.4 MJME, cows would have exercised some degree of selection and the average quality of winter feed consumed was estimated at 9 MJME/kg DM. During spring the quality of the feed consumed was estimated at 11 MJME. Based on their liveweight, weight gain and the time on the property, total average feed consumed has been calculated at 3031 kg DM/head in 2009, 1356 kg DM/head in 2012 and 1569 kg DM/head in 2014 (Table 5). This resulted in average returns per kg of feed DM consumed of 13.4 cents/kg in 2009, 10.2 cents/kg in 2012 and 18.2 cents/kg in 2014. The return was influenced by the purchase price, weight gain and date of sale. For example, in 2009, cows were purchased early and kept for more than 12 months to clean up surplus summer feed. In late 2014, there was intense competition at sale yards from meat companies and cows from Farm 3/14 were sold at auction (5th December) giving a high return (28.1 c/kg DM).

In 2014, cows on the 3 farms were classified into their likely breed groups (Jersey, Kiwi and Friesian) based on colour (Table 6). In spite of large differences in purchase weight, the different breed groups all put on between 120 and 130 kg and had similar overall growth rates (460-490 g/day). This contrasts with the perception that larger framed animals have greater potential for growth and will grow faster. However, it is likely that if cattle were grown to heavier weights, the larger framed animals would have had greater growth potential. Nevertheless, it does raise questions about the large differences in per kg buy-in price currently existing for animals of different size.

Table 5 Slaughter data for cull cows across seven properties.

Year	Values	Farm	Farm	Farm	Mean
2009	Sale LW (kg)	599			599
	DO%	44			44
	Carcass weight (kg)	293			293
2012	Sale LW (kg)	512	525	494	510
	DO%	NM	42	42	42
	Carcass weight (kg)	217*	224	207	216
2014	Sale LW (kg)	597	521	531	550
	DO%	39	44	NM	41
	Carcass weight (kg)	232	228	221*	227

*Animals not killed so mean DO% from the other two farms in that year was used to calculate carcass weights. NM = not measured

Conclusions

A key feature of farming dry, cull cows is their flexibility and this was demonstrated throughout this study. For example, in 2009 a wet spring and summer meant good summer pasture growth and cows were kept through to the following autumn. On the other hand, the cows purchased in 2012 were able to clean up poor quality winter feed but the following spring/summer was the driest recorded on the East Coast in 75 years and cows had to be slaughtered early. This provided a much-needed safety valve for the farmers concerned.

Across 7 farms and 3 years, average purchase and sale dates were 27/5 and 18/1, respectively, meaning cows were typically farmed for 34 weeks. Average cow weight at purchase was 424 kg increasing by 115 kg at point of sale. Across the 3 years, returns averaged 14.1 cents/kg DM consumed. This does not include any benefits of removing low quality feed and performing a pasture control role in spring. Nevertheless, returns are competitive with the estimated 8.9 c/kg DM returns for a high performance beef cow (Morris & Smeaton 2009). There was a wide spread of returns which were affected by many variables including purchase price, time of purchase and amount of surplus feed available, increase in weight and sale date. There is also a trade-off between timing of sale and using cows to achieve maximum clean up. A late spring slaughter generally means higher prices, whereas holding cows to clean up summer feed to increase weights and improve feed quality for other stock usually means lower returns per kg carcass weight.

There are management issues which need to be considered with this class of stock. For example, it is important that cull dairy cows are not pregnant or are pregnancy tested on arrival as there are undesirable consequences (mastitis, metabolic diseases) if these cows are left to calve in extensive hill country. Cull

Table 6 Start and finish liveweight and average growth rate of cows classed as Jersey, Kiwi or Friesian on coat colour across three properties (2014).

Breed	% of cows purchased	Start weight (kg)	Finish weight (kg)	Growth rate (kg/day)
Jersey	7.6	336	456	0.46
Kiwi	27.2	424	522	0.49
Friesian	65.2	469	593	0.47

Note: Breeds were well distributed across the properties and the above figures are raw means

dairy cows are often in light condition when purchased so they need to be looked after on arrival and require several weeks to adjust to the steeper slopes of hill country. There is also an increase in disease risk for a breeding property purchasing trading stock (e.g. tuberculosis and theileria).

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