



# FACT SHEET

JUNE 2014

## GROWING CATTLE FAST ON PASTURE

### Summary

Achieving lifetime cattle growth rates of >1 kg liveweight gain/day (LWG) on pasture has been demonstrated on three Northland farms. These farms achieved average of mob liveweights of >540 kg at 16 months of age. Growing cattle fast opens up slaughter options for cattle during summer if weather conditions or schedule movements are challenging. In addition cattle avoid a second winter where maintenance feed requirements are high and pugging damage can be significant. Increasing cattle growth rates on pasture usually will require a decrease in stocking rate. In many situations stocking rate and liveweight gain balance each other so there is little change to system profitability.

### Monitoring of three farms that achieved high cattle LWG has shown that:

- Achieving high growth rates is mostly about feeding - quality and quantity
- It is easier to achieve high LWG on flat to easy contoured land compared to steep land - good quality pastures are essential
- Good weaning weights make early finishing easier, cattle were >240kg at 6 months of age
- Good cattle genetics make it easier and sex matters - bulls respond better than steers or heifers
- Every day needs to be a cattle growing day, no period of time when cattle are just on maintenance
- Winter and spring are the most critical times to grow cattle, don't rely on summer as it is fickle
- Two of the three farms had pasture renewal programmes

### Project background

'Finished by 20 Months' is a Beef + Lamb New Zealand project supported by the MPI Sustainable Farming Fund and the Hine Rangi Trust. This project focused on how Northland beef farmers might improve farm profitability and sustainability through growing cattle faster and finishing them at a younger age.

### Increasing young cattle LWG provides improvements in:

- Feed Conversion Efficiency
- Meat quality
- Less pugging damage (fewer big animals going through a second or third winter)
- Animal health and welfare
- Potentially more profitable, resilient and sustainable farm systems

The study reported in this paper focused on how three farmers achieve average lifetime cattle growth rates of 1 kg/day.

- Pasture quality was maintained at times with other stock classes or mowing/mulching - especially essential on kikuyu pastures
- All farms had good soil fertility
- Two of the three farms had very good levels of clover within pastures (up to 50% of pasture)
- Two of the three farms used short rotation ryegrass and nitrogen to ensure they had adequate winter/early spring feed
- Farms ran a lower stocking rate to ensure high feed levels - mainly around 2 bulls/ha
- Programmed animal health treatments minimise the negative effects of disease

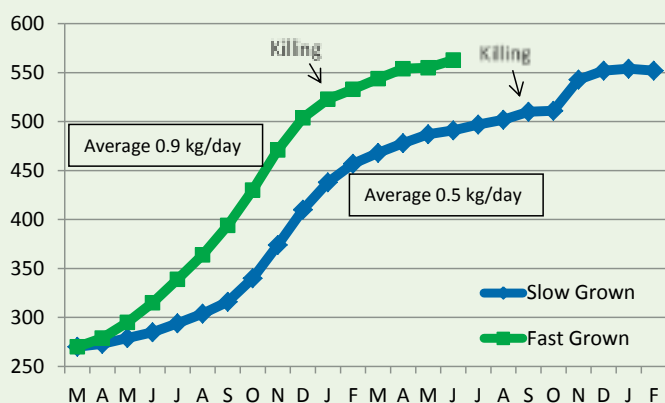


## Choosing a target growth path for cattle

Cattle finishing systems are very dynamic. For most beef finishers the objective is to maximise profit while maintaining (or improving) the farm. There is no one finishing system that is best for all farms as differences in climate, contour, soil, pastures, infrastructure and farmer dictate different constraints.

Some farms have the option of choosing an early finishing policy. This usually requires a compromise of stocking rate to ensure cattle are well fed, a trade-off between stocking rate and liveweight gain.

The figure below shows two common growth paths for well grown weaners (270kg liveweight in March) to achieve slaughter at 550 kg liveweight. In the fast growth path cattle slaughter begins at 17 months of age (assuming September birth), whereas the slow growth path begins slaughter at 24 months of age. With the fast growth path 54% of feed goes to maintenance while 70% goes to maintenance in the slow growth path.



Farm systems computer modelling using Farmax has shown that low stocking rate and high liveweight gain cattle finishing systems can be as profitable as high stocking rate and low liveweight gain cattle systems. However not all farms and pastures can sustain high cattle growth rates. If pasture quality is medium to low due to poor species, low soil fertility, steep contour, etc, then high liveweight gains are unlikely to be achieved. Reducing stocking rate will not be fully compensated by higher liveweight gains and will lead to a low profit system. This is illustrated in the figure below.



High stocking rate and low LWG systems are likely to be more suitable for properties with medium to poor quality pastures. Getting the right stocking rate and achievable targets with flexibility to handle climatic variances is critical to optimising profit and sustainability.

## Three case studies where high liveweight gains are being regularly achieved

Laurie Copland *Broadwood*

### Key points

- Well grown weaners coming off well fed beef cows gives calves a good start, 1.15 kg/day between birth and weaning
- Bulls mostly grazing easy contoured land with some new and short rotation pastures, good feeding levels from weaning on
- Top bull mob averaged 577 kg at less than 16 months of age over both years
- Average carcass weights over two years - top line of bulls averaged 330 kg carcass at 17 months of age, middle line of bulls averaged 314 kg carcass at 18 months of age
- This data illustrates the importance of weaning weight and post weaning feeding in getting bulls finished at an early age at good weights
- 11 kg response to copper supplementation in one year, no response in the following seasons

### Farm background

Laurie Copland farms a mix of broken hill country west of Broadwood in the Far North. Breeding cows start calving on 20th September and all progeny is finished. In addition some beef weaners are bought in. Each stock class on the farm tends to be run in its own system with some movement of cows to do tidy up as needed.

Approximately 10% of the property is flat. This is where he finishes his top priority stock classes - usually bulls. These flats have been regularly renovated with new ryegrass, herbs and clovers. Soil fertility on the farm is relatively good. He targets to finish all bulls before the second winter, aiming to have a good proportion of these killable any time from December on at 15 months of age. This early finishing provides flexibility for summer dry and catching the market before the normal summer/autumn slide in schedule.

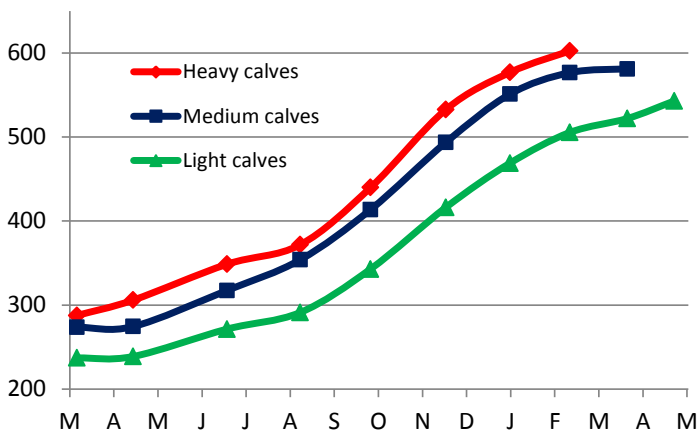
Two of the three mobs monitored were run on flat/easy land from weaning on, while the lightest mob of bulls had approximately 2/3rds medium hill within their system. Stocking rates averaged 2.1 bulls/ha.

### Bull liveweights

Bull weights and pasture conditions were monitored at the Copland's for two years. Bulls were split into three mobs at weaning based on weaning weight. Average liveweight for each mob is shown in the graph below. Over the two seasons, liveweight gains during winter averaged 0.55 kg/head/day, spring 1.38 kg/day and summer 0.90 kg/day.

Overall the achievement of liveweight at 17 months of age was largely determined by the weight of bulls at weaning. The LWG of the two heavy and medium calf mobs was very similar with the light calves showing poorer LWG, largely due to the hill country within their system.

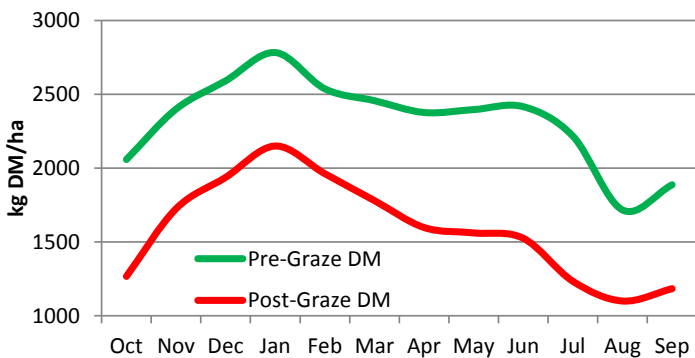
**Figure 1.** Average liveweights (kg) of the 2010 born and 2011 born bulls for the three monitored mobs



### Pasture conditions

Pre and post grazing pasture levels were in the sweet zone of 2500 kg DM/ha to 1500 kg DM/ha. However these levels dropped during winter and early spring. Bull growth rates were good during this early spring period despite these low feeding levels. This may be due to the fast rotation during that time of 15 - 20 days, where cattle were receiving a fresh pick every day.

**Figure 2.** Average of two years pre and post grazing levels (kg DM/ha)

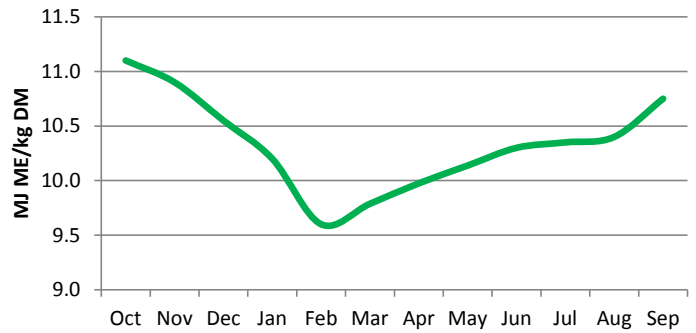


Quality of pasture varied through the seasons in direct contrast to the grazing levels. Pasture quality was maintained during autumn by bringing cows down onto the finishing area when needed.



Heavy bulls averaging 577 kg at 16 months of age

**Figure 3.** Average of two years pasture metabolisable energy



### Slaughter weights and timing

In both seasons the majority of bulls were slaughtered before bulls were 20 months of age at an overall average carcass weight of 314 kg. Average slaughter weights and average age of bulls at slaughter are shown in the table below. This early slaughter avoided having heavy bulls on these vulnerable soils which are easily damaged during wet weather. The fast growth rates provided the ability to slaughter bulls as desired during summer/autumn thus providing flexibility to respond to dry periods or falling schedule.

**Table 1.** Carcass weights and age for the two monitored years

	2010 born bulls		2011 born bulls	
	Carcass weight	Age at slaughter	Carcass weight	Age at slaughter
Heavy bulls	321 kg	16 months	339 kg	18 months
Medium bulls	305 kg	17 months	323 kg	19 months
Light bulls	282 kg	19 months		

### Animal health treatments

Bulls were drenched 6 weekly with oral combination or pour-on treatments from weaning through to 14 months of age.

For 3 years, half of the bulls within each mob received a copper injection in mid-July to determine if there was any response to this treatment. In the first season there was a statistical response of 11 kg liveweight after 6 months. The following 2 seasons showed no response.



Light bulls averaging 469 kg at 16 months of age

# Landcorp Kapiro Station *Business Manager Andrew Kirk*

## Key points

- Mobs averaging just over 1 kg/day during full lifetime
- Cows well fed during lactation to get good weaning weights
- Genetics contributing to achieving good LWG
- Grow bulls early - not relying on summer on these light soils
- Annual ryegrass & nitrogen ensures winter/spring pasture on hand for good growth
- Control pastures during summer/autumn with other stock classes to maintain quality
- Feed, feed, feed

## Background

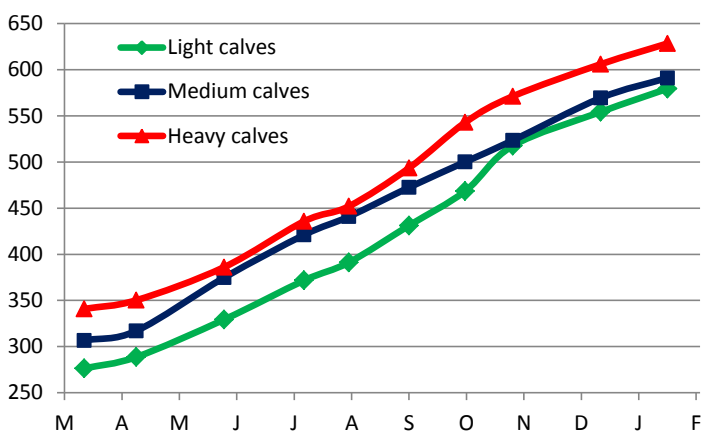
Landcorp's Kapiro Station is located just north of Kerikeri. The property incorporates an Angus stud. Bulls are weaned and put into mobs of around 90 bulls. Bulls are run on the volcanic ash portion of the farm from weaning until dispersal and wintered behind a wire. The mob sizes are reduced from the middle of October as bulls are either joined with the herd, dispersed as sires or sold as dairy tail up bulls.

Achieving good growth rates on the bulls is important to ensure they are ready for sale. As the farm's light soils are prone to summer dry it is important that bulls are grown early and at target weights before Christmas.

## Bull liveweights

Bulls were split into three grazing groups based on weight at weaning. The average liveweights of the three mobs over two years are shown in the graph below. Average of all mobs over two years showed LWG of 0.87 kg/day in winter, 1.28 kg/day in spring and 0.77 kg/day in summer.

**Figure 3.** Average liveweights of the 2010 born and 2011 born bulls



The difference in liveweight at 18 months of age was largely determined by weaning weight differences. The table below shows how similar the post weaning LWG was between the different groups. Though these bulls went for breeding rather than slaughter, if they were to be slaughtered then this could occur prior during early summer depending on summer moisture and beef schedule movements.

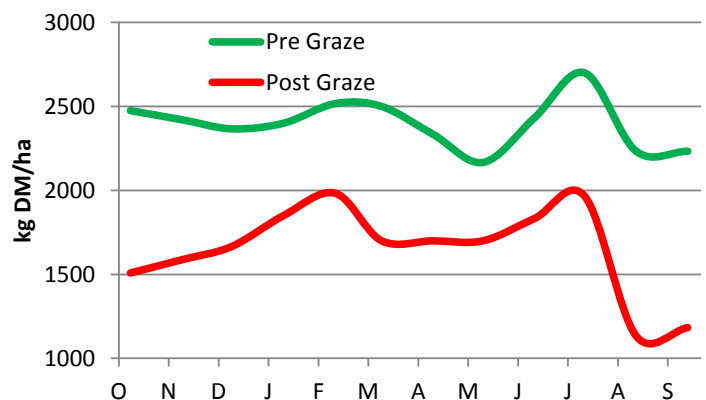
**Table 2.** Average of two years liveweights (kg) and liveweight gains (kg LWG/day)

Wean weight	Weaning weight	18 month kg LWT	LWG Pre-wean	LWG Post Wean	Lifetime LWG
Light bull calves	276	579	1.07	0.99	1.03
Medium bull calves	307	591	1.19	0.93	1.04
Heavy bull calves	341	628	1.28	0.94	1.09

## Pasture conditions

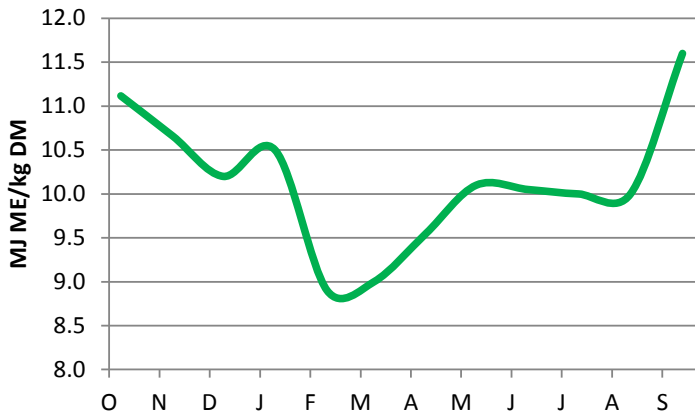
Pre and post grazing levels were kept in the sweet zone of around 2400 to 1600 kg DM/ha for most of the two years apart from late winter/early spring when covers dropped to low levels. Some of the areas grazed by the bulls was undersown with annual ryegrass during autumn. Nitrogen was used when needed to maintain pasture covers during the winter/spring period.

**Figure 4.** Average of two years pre and post grazing levels (kg DM/ha)



Pasture ME remained relatively high (>10) during most of the two seasons apart from the February/March period. The proportion of the beef block in kikuyu is kept down by a regrassing programme. This leads to good grazing control on the kikuyu pastures that are present. Clover levels in the pasture were low averaging only 1%.

Figure 5. Average of two years pasture metabolisable energy



Kapiro bulls on annual ryegrass in October



Bulls averaging 628 kg at 18 months of age

# Lyndsay and Erica Whyte *Taupo Bay*

## Key points

- 2010 born steers had a lifetime average of 0.9 kg LWG/day to be 548 kg at 19 months of age
- 2011 born bulls had a lifetime average of 1.11 kg LWG/day to be 652 kg at 19 months of age
- Both generations above had the same genetics and similar feed/management -illustrating the greater growth rate possible from bulls
- Weaning weight of 288 kg for 2011 born bulls provided a good start
- Very developed pastures (up to 50% clover) support good cattle growth
- High attention to kikuyu control during summer/autumn (beef cows & mulching) ensures ryegrass dominance during winter/spring
- Soil fertility, intensive subdivision and precise grazing management enhance pastures
- Bulls on pastures with a higher proportion of Italian ryegrass showed no greater LWG than another mob on normal pasture

## Background

Lindsay and Erica Whyte farm a mix of hill and easy contoured land near Taupo Bay in the far north. Their breeding cow herd (Angus X and Hereford/Friesian X Angus) supplies most of their finishing cattle. Cows are mainly grazed on the hills during winter/spring and finishing cattle on easy land. Cows and calves clean-up behind the finishing cattle during summer/autumn.

Pastures are kikuyu based and the Whyte's pay a lot of attention to kikuyu control during summer/autumn. This is achieved through grazing cows and calves, taking off baleage (mainly fed to cows in winter) and mulching. Some Italian ryegrass has been broadcast in the past and makes up approximately 10% of the pasture during winter/spring. The farm is intensively subdivided and cattle are generally shifted every 2 days unless wet when daily shifts are used.

The objective is to finish all male cattle and some of the heifers before the second winter. This reduces the number of big cattle on during winter/early spring to minimise pugging damage on the soft soils.

## Monitored data

Liveweights and pasture conditions were monitored for two mobs of 2010 born steers and two mobs of 2011 born bulls. These two generations were identical genetically. Male cattle are top priority on the farm and are seldom hungry.

Male cattle liveweights are shown in the following graph. Feeding conditions were considered similar between generations, apart from drought conditions during the summer for the 2011 born bulls. Despite this the bulls averaged 100 kg heavier than the steers at 19 months of age (548 versus 652 kg liveweight).



Good feed under 19 month old steers at 540 kg liveweight

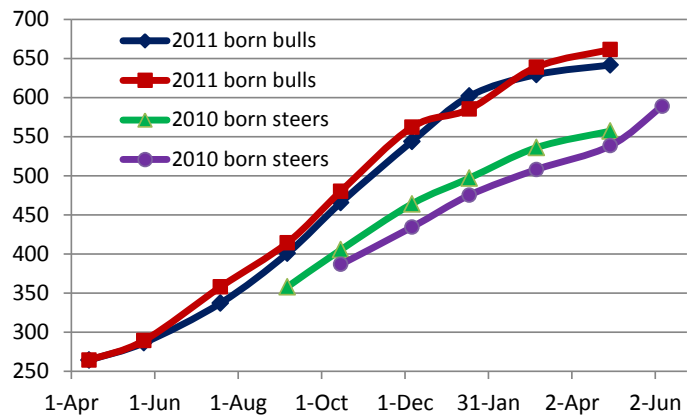


19 month old bulls at 642 kg liveweight



This illustrates the advantage of testosterone when cattle are under good feeding conditions. This difference would likely be less if cattle were under a poorer feeding regime.

**Figure 6.** Average liveweights of two mobs of 2010 born steers and 2011 born bulls



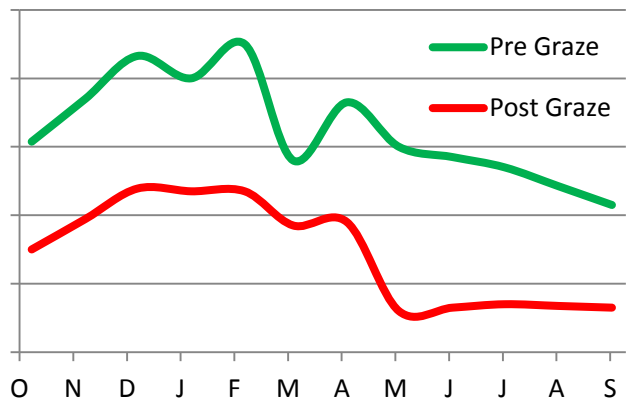
The weight gains achieved by the 2011 born bulls would allow bulls to be slaughtered any time after 16 months of age, though this option was not taken with these monitored cattle. Having this slaughter option adds flexibility to respond to dry conditions or a falling schedule.

### Pasture conditions

Pasture grazing levels are mainly kept in the sweet zone. If feed is tight then other stock classes tend to suffer first before the bulls are compromised. Baleage fed to cows is used to take pressure off feed supply within the farm system. No nitrogen is used on the farm.



**Figure 7.** Average of two years pre and post grazing levels (kg DM/ha)



Metabolisable energy (ME) within pasture showed a significant dip during late summer/autumn when kikuyu is rampant. Overall these ME levels are good compared to most kikuyu based beef farms. White and red clover proportion within the pasture was extremely good with levels of up to 50% clover. These good quality pastures are attributed to pasture management (especially kikuyu control), soil fertility and avoidance of pugging damage.

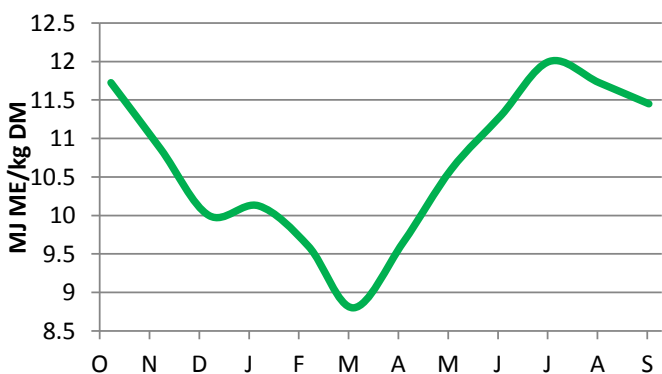


Breeding cows do the hard work cleaning up kikuyu pastures behind the bulls

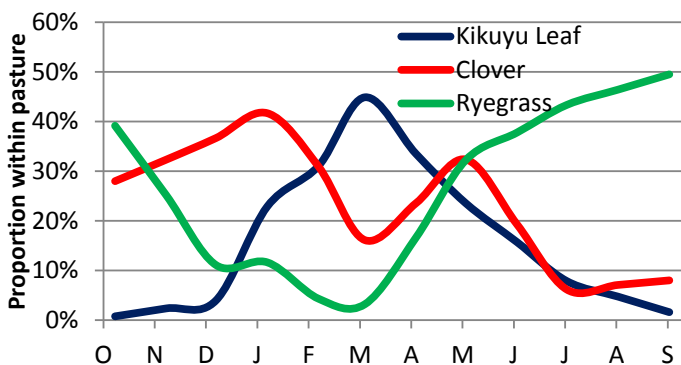


Very high clover levels

**Figure 8.** Average of two years pasture metabolisable energy



**Figure 9.** Proportion of pasture species within pasture



### Animal health and Italian ryegrass trials

Bulls are drenched with an oral combination 6 - 8 weekly until 12 months of age. A copper injection was given to half of the bulls within each mob, no liveweight response was observed. An extra drench was given to half of the bulls within each mob at 14 months, no liveweight response observed.

To investigate whether Italian ryegrass would enhance pasture growth and bull liveweight gain, an area was sown with Italian ryegrass during April 2012, through broadcasting seed and mulching. This increased the proportion of Italian ryegrass in the pasture during winter/spring from 9% to 28%. One of the monitored bull mobs was grazed on this area during winter/spring to investigate whether this would improve cattle growth rates. There was no difference in LWG of bulls grazed on normal pastures versus over-sown pastures.

### For more information

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