

## BRIEF COMMUNICATION: Meta-analysis of beef cow live weights in the mid-2000s

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### Abstract

As traditional beef cows are rarely weighed, there are few quality data available on beef cow live weights. Data were collected on 12 farms between 2008/09 and 2009/10 as part of a project validating the data used in the New Zealand Agricultural Greenhouse Gas Inventory Model. Beef cow live weights were collected on both herd cows (mean 541.3 kg) and on cull cows (mean 552.6 kg). Carcass data were collected at slaughter to obtain better values for dressing-out (42.6%). Carcass data provided by Landcorp Farming Ltd indicated that their average beef cow live weights were 568 kg in 2008/09. Carcass data collected by the B+LNZ Economic Service from 8511 beef cows in 2007/08 indicated that cow live weights averaged 537 kg. An unpublished MAF Sustainable Farming Fund study reported weights for 1120 cows across 15 farms and found an average beef cow live weight of 576 kg in 2006/07. An average across all these studies suggested that beef cow weaning weights between 2006 and 2010 were around 553 kg.

**Keywords:** beef cow; liveweight; dressing-out %

### Introduction

New Zealand's Agricultural Greenhouse Gas Inventory Model calculates methane emissions from animal live weights and estimated energy and feed intakes (Clark 2008). Accurate live weight values are important as they can have a significant impact on methane values when scaled up over the national herd. Live weights are calculated from carcass weight but in the case of beef cows, this calculation is difficult because the carcass weights of dairy and beef cows are not separated in national slaughter statistics. The Agricultural Greenhouse Gas Inventory Model, therefore, uses a number of assumptions to estimate the beef carcass weight and uses a dressing-out percentage of 45% to estimate beef cow live weight (433 kg in the 2007/08 season). This project set out to collect data on beef cow live weight because of the paucity of current data available on beef cow live weight or dressing-out percentage (Muir et al. 2008).

### Materials and methods

Data on breeding cow live weights were collected from 12 North Island farms in 2008/09 and 2009/10 (Table 1). Live weights were collected at weaning/pregnancy testing cows to be retained in the herd (1065 cows were weighed in 2008/09 and 735 cows were weighed in 2009/10). Where herds were very large, a sub-sample of at least 20% of the herd was weighed. All cull cows were weighed (188 in 2008/09 and 371 in 2009/10). Live weight was recorded soon after yarding. Carcass weight (as per killing sheets) was collected from the cull cows on a mob basis and this was used to calculate dressing-out percentage. Breed data was as supplied by the farmers. No data analysis was undertaken as in some cases the data was provided by the farmers as group means.

Additional data were collected from three sources (Table 2). Unpublished South Island data was supplied

by Craig Thomas of Mid-Canterbury Vet Services from a Ministry of Agriculture and Fisheries Sustainable Farming Study (MAF SFF) involving 2100 breeding cows across 15 South Island farms in 2006/07. Geoff Nicol of Landcorp Farming Ltd provided carcass data from 96,176 cull beef cows slaughtered between 1997/98 and 2008/09. The B+LNZ Economic Service, which undertakes an annual survey of 560 sheep and beef farms, collected carcass weights from 8511 beef cows in 2007/08.

### Results and discussion

On average, the North Island beef cows being retained in the herd were 541 kg and the cows being culled were 546 kg (Table 1). There was a large difference in cow weights between years (510 kg in 2008/09 and 573 kg in 2009/10). Data were collected in late summer/autumn when cows are likely to be at their heaviest and, thus, this may overestimate beef cow live weight over the year. For example, over three years (2001-2003) beef cow live weights averaged 511 kg at weaning and 505 kg in winter (Morris et al. 2006). However, the same study showed that the largest variation was between years, with weaning weights ranging from 475 kg to 552 kg. Since beef cows are used to harvest and manage surplus grass it is not surprising that within-year and between-year fluctuations in feed supply impact beef cow live weights. During the 2008/09 farm survey, cull cows were heavier than herd cows (527 kg vs 510 kg) but in 2009/10 the cull cows were lighter than their herd mates (566 kg vs 573 kg). These differences probably reflect the feed conditions and culling decisions being made at the time. The cull cows had an average dressing-out of 42.6% – compared with a figure of 45% used in the Inventory model.

The majority of the 2100 breeding cows across the 15 South Island farms in 2006/07 were Angus or Hereford x Angus crosses with an average weight of 568 kg.

**Table 1** North Island beef-cow live weights and carcass weights (kg) recorded in 2008/09 and 2009/10.

Farm	Breed	Herd cow weight (kg)	Cull cow weight (kg)	Carcass weight (kg)	Dressing-out %
2008/09					
1	A	505.7	547.7*	224.0	40.8
2	A	474.0	489.7	205.6	42.0
3	A × F	539.1	539.2	229.3	42.5
4	A	459.9	479.8	200.4	41.7
5	A × S	543.6	587.4	262.0	44.6
6	A	534.8	554.9	203.3	36.6
Mean		509.6	533.1	220.8	41.4
SD		35.8	40.96	23.38	2.66
2009/2010					
1	A × F	515.2	515.0*	202.8	39.4
2	H × F	543.0	626.3	274.9	43.9
3	A	632.8	570.7	265.7	46.6
4	A	635.7	586.0	265.6	45.3
5	A	524.4	533.9	231.2	43.3
6	H × F	586.7	600.1*	269.7	44.9
Mean		573.0	572.4	251.7	43.9
SD		53.7	71.7	33.9	2.36
Overall Mean		541.3	552.6	236.2	42.6

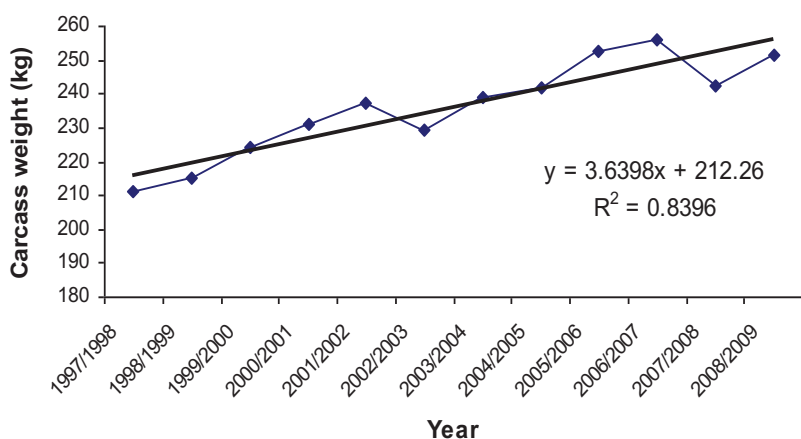
\*Weight prior to slaughter. Cull cows were farmed on before slaughter.  
 A = Angus, A × F = Angus x Friesian, A × S = Angus × Simmental, H × F = Hereford × Friesian

**Table 2** Summary of beef cow data collected from four sources (North Island farms, South Island farms, Landcorp Farming Ltd and Beef & Lamb NZ Economic Service).

	Live weight (kg)	Carcass weight (kg)	DO%
Current study (2008/09 and 2009/10)	541	236.2	42.6
Thomas (Unpublished data 2006/07)	568 (2100 cows)		
Landcorp Farming Ltd (2007/08)	568* (8995 cows)	242	
B+LNZ Econ Service (2007/08)	537* (8511 cows)	229	
Average liveweight	553.5	235.7	42.6

\* Live weight calculated from carcass weight using dressing-out of 42.6%

**Figure 1** Changes in carcass weight (kg) of cull Angus beef cows between 1997/98 and 2008/09 (Landcorp Farming Ltd) (P < 0.001 for fitted line)



In 2007/08 the average carcass weight of the 8995 cows slaughtered across Landcorp Farming Ltd. was 242 kg. Using the dressing-out of 42.6% collected in the present study, the live weight of cows on Landcorp farms would have averaged 568 kg in 2007/08. There is also evidence of a linear trend with carcass weights increasing by 3.64 kg a year between 1997/98 and 2008/09 (Figure 1). Using a dressing-out of 42.6%, this suggests that Landcorp beef cow live weights have been increasing by 8.5 kg/year.

The average carcass weight from 8511 beef cows collected by the B+LNZ Economic Service was 229 kg and using a dressing-out of 42.6% from the present study, the average live weight of these cull cows would have been 537 kg.

The data on beef cow live weights have been summarized in Table 2. Average beef cow live weights appear to be around 553 kg for the period in which data were collected (2007-2010). This is significantly higher than the 433 kg predicted by the inventory model for 2007/08. The data from Landcorp Farming Ltd also indicates that beef cow live weights have been increasing at 8.5 kg/year. Current beef cow live weights of 553 kg can be contrasted with the beef cow live weights of 422 kg reported by Smeaton et al. (1986) for Angus and Hereford x Friesian cows. These heavier weights are likely to be a result of on-going selection for larger animals as well as a move away from high stocking rates associated with farming subsidies in the 1980s to high-performance sheep systems of the 1990s. Whilst beef cow live weight will vary with breed, feed supply and time of the year, beef cow live weights are clearly heavier than many believe. This may mean that the stock-unit relativity between cows and ewes needs to be re-examined, as previously suggested by Nicol and Brookes (2007).

**Acknowledgements**

To the farmers who willingly cooperated in supplying data for this report and to the late Geoff Nicoll of Landcorp Farming Ltd for beef cow carcass weights. Craig Thomas of Mid-Canterbury Vet Services provided South Island data on beef cow live weights from the MAF SFF project on beef-cow efficiency (Grant 06/11). Data on beef-cow carcass weight was kindly provided by Rob Davison of B+LNZ.

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