

A review of dressing out percentage in New Zealand livestock

Final Report

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Introduction

Acronyms

CCW	Cold Carcass Weight
DO%	Dressing Out Percentage (Carcass Weight / Liveweight) *100
ELW	Empty (starved) Liveweight (12-24 h off pasture)
HCW	Hot Carcass Weight
LWP	Liveweight off Pasture
MoE	NZ Ministry for the Environment

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Introduction

An accurate knowledge of dressing out percentage (DO%) for different livestock classes is important to farmers as it enables them to accurately estimate carcass weight from on-farm liveweight. This enables them to target the carcass weight ranges which will maximise returns for their own farming operation.

Dressing out percentage is also important on a national scale for the calculation of animal liveweights. New Zealand has good survey data on animal numbers and an accurate system of collecting, auditing and collating the carcass weight data collected by meat processing companies. From the carcass weights we can calculate the liveweight of a particular class of stock on a national basis if we accurate dressing out percentages. These figures are significant because methane emissions are closely related to feed intake and from the combined figures for livestock numbers, liveweight and production level we can predict methane production.

A number of production factors affect DO%, such as an animal's fatness, breed and stage of maturity. Moreover, there are a number of ways of calculating and expressing DO%. This report reviews the New Zealand literature on the relationship between liveweight and carcass weight with a view to improving the accuracy of the DO% figures used in the New Zealand methane model.

Methods

This review is based on an electronic search of the literature using the following journals:

- Proceedings of the New Zealand Society of Animal Production
- Proceedings of the New Zealand Grasslands Association
- New Zealand Journal of Agricultural Research
- New Zealand Veterinary Journal
- New Zealand Journal of Experimental Agriculture
- Journal of Dairy Science (*specifically for dairy cows*)

All references pertaining to DO% have been included but the focus and discussion has centred on hot carcass weight and fresh (unfasted liveweight) as these provide the data most relevant to the statistics collected and to the methane model. Where data is lacking (e.g. ewes) or where the literature is dated (e.g. lambs) unpublished data has been sourced.

A Microsoft Access database was created to allow readers to assess the actual data relevant to this review. Two reports are provided in Appendix 1 and Appendix 2.

Effect of method of calculation on dressing out percentage

Farmers are typically paid on the weight of carcass at slaughter after removal of the head, feet, skin and digestive tract. The digestive tract varies in weight depending on what the animal has been eating and Kirton et al. (1968) indicated that the digestive tract could account for 10-22% of lamb liveweight. The method of calculation also affects dressing out percentage and there are four possible ways of calculating dressing out percentage. Moreover, many researchers¹ do not make clear which one they have used. This review refers to four weights which are used when calculating DO%.

Fresh Liveweight (LWP): Liveweight recorded straight off pasture. This is the best indicator of liveweight, is a good predictor of carcass weight and the most readily accepted measure by farmers. Since the animals grazing and emitting methane will be standing in the paddock, “full” or “fresh liveweight is likely to be the most relevant predictor of methane emission.

Empty Liveweight (ELW): Liveweight recorded after an overnight (or longer fast). The difficulty with this weight is that the type of feed affects the results with high quality feeds having faster rumen transit times than low quality, bulky, fibrous feeds. The length of fasting also has a large effect on the liveweight recorded. Many researchers, particularly historically, have used fasted liveweights to report DO%.

Hot Carcass Weight (HCW): The weight of the carcass immediately after the skin, head, feet and internal organs have been removed. Up until 30th September 1994 farmers were paid on cold carcass weight and data was reported in this manner. Prior to this time, meat processors were weighing hot carcass weights and then applying a shrinkage factor to account for moisture loss whilst being chilled (typically 3 to 5%) and to estimate a cold carcass weight on which farmers were subsequently paid. Since this system was potentially open to abuse, legislation was changed so that from 1st October 1994, farmers were paid on hot carcass weight and these were the figures used in reporting to MAF. Kirton et al. (1971) noted that scales in the abattoir automatically deducted 4.5% from the hot carcass weight. In the year ended 30th September 1994, the NZ Meat Board used a hot carcass weight of 15.42 kg and a cold carcass weight figure of 14.97 kg which implies a 3% shrinkage in lambs. Between 15/11/05 and 27/2/08 Muir (unpublished data) recorded hot and cold carcass weights of 1831 slaughtered lambs and found a 2.3% loss in weight between hot and cold carcass weights. Historically, carcass weight loss between slaughter and boning could be as high as 5% but with modern spray chilling techniques these losses can be as low as 1%. One of the difficulties for this review is that in some of the research prior to 1994, authors are not clear about whether hot carcass weight is actually as stated or minus 4.5% to approximate cold carcass weight.

Cold Carcass Weight (CCW): This is the carcass weight recorded after chilling is complete. It is the most important figure for a meat processor as it is the weight of product entering the boning room that they have to work with.

¹ Note that the references in Appendix 2 indicate which method of calculation of DO% has been used.

Introduction

Kirton et al. (1984) assessed 2200 lambs, over a three-year period and showed the extent to which DO% is influenced by the calculation method used. These values were obtained for lambs weighing on average 27.7 kg (LWP). For a carcass of 13 kg, estimated liveweight ranged from 28.6 to 32.3 kg (a difference of 13%) depending on the figures used (Table 1). It is clearly critical that researchers state how DO% has been calculated.

Table 1. Effect of method of calculation on the estimation of DO%

Method of calculation	Dressing Out Percentage	Live weight estimated from Dressing Out for an average carcass of 13 kg
hot carcass weight x 100/fresh liveweight	42.2	30.8
cold carcass weight x 100/fresh liveweight	40.3	32.3
hot carcass weight x 100/empty liveweight	45.4	28.6
cold carcass weight x 100/empty liveweight	43.3	30.0

Sheep - lambs

Many researchers have reported DO% in lambs (Appendix 1) and although there is much early work on DO%, it's relevance to the current sheep flock is questionable. Lambs slaughtered 20 and 30 years ago were normally smaller and fatter than they are today. Also, given the impact of method of calculation on estimate of DO%, those papers that are not clear about methodology are less helpful than those which provide hot carcass weight (HCW) against live weight off pasture (LWP). Table 2 summarises the number of references (in brackets) for each category.

Table 2 Summary of DO% for lambs reported in the literature

Class	DO% Calculation not stated	Livewt (Pasture) : CCWt	Livewt (Starved) : CCWt	Livewt (Starved) : HCWt	Livewt (Pasture) : HCWt	Value used in a modelling exercise
Ewe lambs	45 (1)	46.4 (1)			44.6 ² (1)	
Ram lambs	42.4 (1)			49.1 (1)	43.3 ³ (4)	
Wether lambs	44.7 (2)				44.2 (2)	
Mixed sex	45.4 (3)	41.0 (1)	47.7 (2)		44.1 (10)	41.5 (4)

The effect of liveweight on DO% in lambs

There is conflicting evidence for an effect of increasing liveweight on DO% in lambs. Kirton et al. (1984) summarised their own data as well as earlier work on DO% in lambs. They reported data from 2207 shorn, weaned lambs in the early 1970's with live weights varying from 10 to 46 kg (average 27.7 kg). They concluded that lamb DO% increases with increasing liveweight.

A very large and recent (1998-2007) data set for lambs has been collected by On-Farm Research in Hawkes Bay (Muir, unpublished data). This data set is valuable because of the large number of animals involved and the detail relating to each animal. Lambs were slaughtered over a wide range of liveweights (30 – 65 kg) with an average of 45 kg. These weights are representative of current industry practice. For the 6,200 lambs killed, an average DO% of 43.8% was obtained (Muir, unpublished data). If lamb DO% increases with increasing liveweight, then the slope of the regression line must change as liveweight increases. The data presented below does not

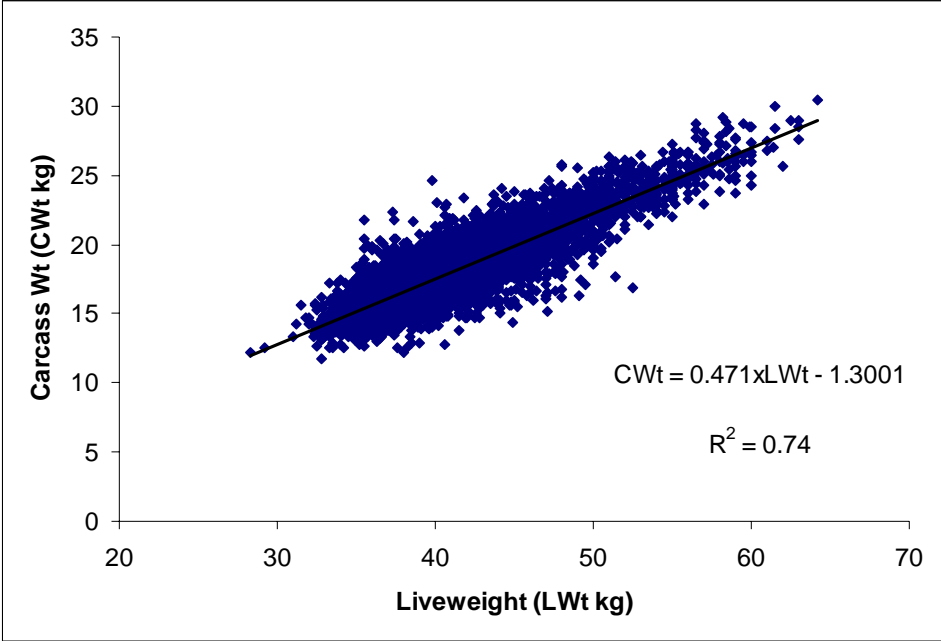
² Over 2787 ewe lambs from 1998-2007 Muir et al. (unpublished data) recorded a DO% of 44.6.

³ Over 3412 ram lambs from 1998-2007 Muir et al. (unpublished data) recorded a DO% of 43.2, very close to the (literature) mean of 43.3.

Sheep- Lambs

support this assertion. However, these animals tended to be drafted on fatness rather than weight which may have helped obscure any trend of increasing lamb DO% with increasing fatness.

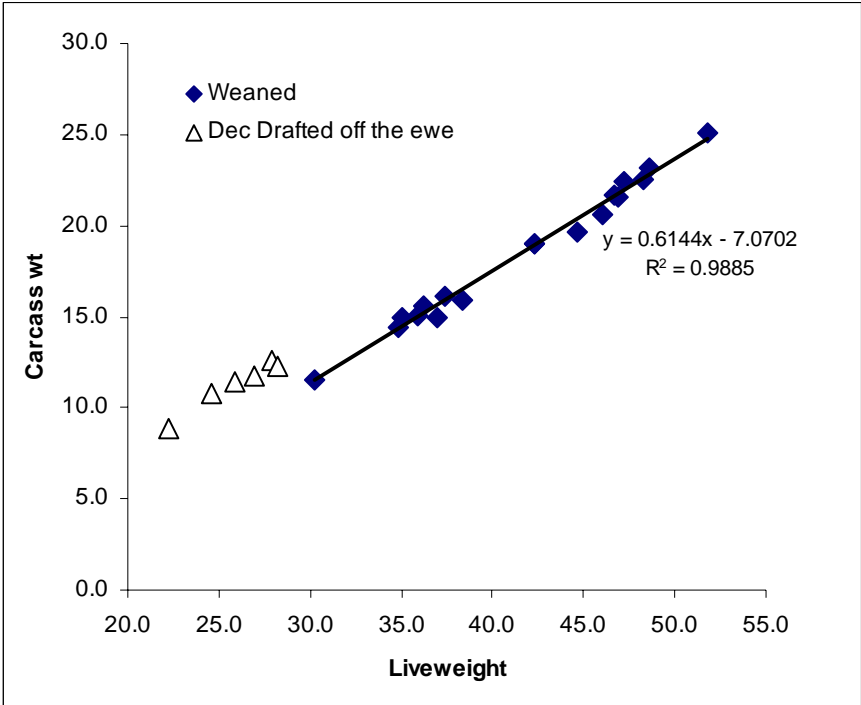
Figure 1. Relationship between liveweight and carcass weight (Muir, unpublished data)



Recently published data, based on heavy lambs either weaned or unweaned by Scales et al. (2000) show a similar trend, for DO% to remain constant in weaned lambs over a range of commercial liveweights (Figure 2).

Sheep- Lambs

Figure 2. Relationship between liveweight and carcass weight for 1578 lambs born to different sires over merino ewes, weaned and unweaned (Redrawn from Scales et al., 2000).



DO% was higher in lambs drafted directly off the ewes and if these had been included, the relationship would be suggestive of a curvilinear relationship. This may help explain why other researchers (Kirton et al. 1984) have stated that DO% increases with increasing liveweight.

Further evidence is available from the data of Devine et al (1993). Liveweight data was not provided in this paper but fasted liveweights have been supplied by P. Muir. In this experiment, a fast growing group of 7 month old shorn lambs had a higher fat content and higher DO% than 14 month old lambs of a similar genotype which were grown slowly to a similar carcass weight and slaughtered at the same time (Table 3). This is the most convincing data set that we can find for an increasing DO% as lambs get heavier and fatter. It is likely that it is a fatness effect and that in many situations the effect is masked because the differences in carcass weight are small or because the lambs are actually drafted on carcass fatness in order to avoid over fat penalties.

Sheep- Lambs

Table 3. Effect of fast and slow growth rates on lamb DO% and carcass fatness.

Growth rate to the same liveweight	Fasted liveweight	Cold carcass weight	DO%	GR (mm)
Fast growth rate (7 months)	40.1	17.5	43.7	6.7
Slow growth rate (14 months)	43.2	17.2	39.8	4.0

Effect of increasing age on DO% in lambs

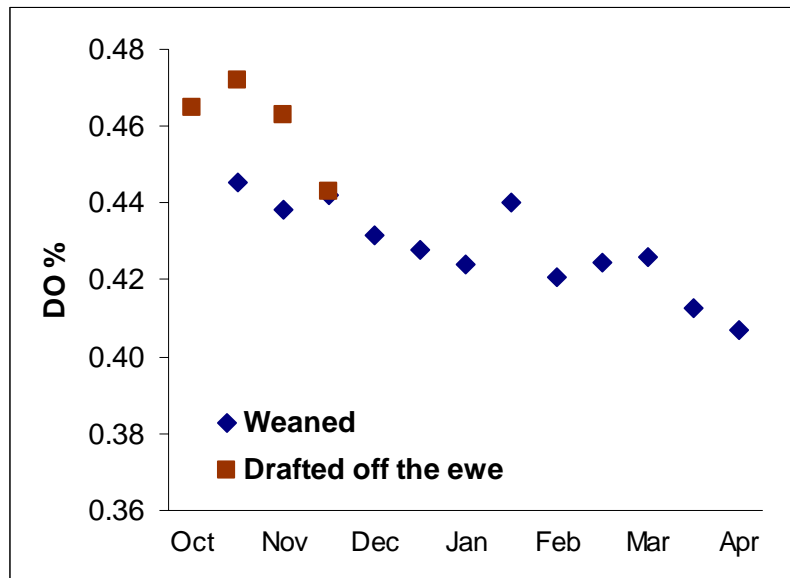
The data from the 6000 lambs slaughtered from 1998 to 2007 (Muir et al. unpublished data) show that as lambs age, their DO% declines (Figure 3) in spite of being slaughtered at similar liveweights. This is not surprising as older lambs have a bigger and more functional rumen and a greater amount of wool at slaughter.

Effect of weaning on DO% in lambs

Unweaned lambs (as expected and noted by others e.g. Kirton, et al. 1984) have a higher DO% than weaned lambs as a result of a less developed rumen. Of the 6213 lambs studied by Muir (unpublished data) 889 were slaughtered off the ewe and DO% calculated (Figure 3). Slaughter groups have been grouped across years into either the first half or second half of each month. DO% was highest in the youngest lambs drafted directly off the ewes. However, even when lambs were still left on the ewe but drafted later, their DO% trended towards their weaned counterparts as their reliance on milk declined. This trend was also evident in the unweaned lambs - as they got older and developed larger and more functional rumen and produced more wool. Ultimately, the DO% of lambs killed in April trended towards the DO% values obtained for ewes (Bray, unpublished data) as they became more mature.

Sheep- Lambs

Figure 3. Effect of weaning and age on DO% in 5300 weaned lambs and 889 lambs drafted directly off the ewe (Muir et al. unpublished data).



Breed effects on DO% in lambs

A number of research teams have assessed breed effects on the carcass attributes of lambs. Kirton et al. (1995) reported 7885 lambs from 15 ram breeds over Romney cast for age ewes between 1963 and 1972 (Table 4). DO% ranged from 41 to 44.5 when based on HCW to LWP. However, their HCW included kidneys and channel fat which would tend to increase the DO% compared to standard practice today. In their study, Romney and Merino lambs had lower dressing out percentages. Merinos, in particular, are noted for their leanness and others have also noted the low dressing out percentage in merino lambs - 39% compared to other breeds at 45% (Scales, et al., 2000), although these authors stated that these differences were largely due to differences in carcass weight between the lighter merinos and other breeds.

Sheep- Lambs

Table 4. Effect of breed and method of calculation of DO% in 7885 lambs slaughtered between 1963 to 1972 (Kirton et al. 1995).

Sire Breed	Lambs No	LWP	ELW	HCW	Full DO%	Fasted DO%
		LW off pasture (kg)	Empty LW (kg)	Hot Carcass Weight (kg)	(HCW/LWP)	(HCW/ ELW)
Stud Southdown	3259	30.7	28.2	13.7	44.5	48.5
Flock Southdown	798	31.0	28.4	13.8	44.4	48.5
Romney	444	28.6	26.1	11.8	41.0	45.1
Dorset Horn	299	33.5	30.8	14.9	44.4	48.3
Poll Dorset	258	33.4	30.9	14.8	44.5	48.1
Hampshire	289	34.0	31.3	14.8	43.7	47.3
Border Leicester	253	34.1	31.2	14.8	43.2	47.3
Suffolk	264	33.5	30.8	14.7	43.8	47.7
Dorset Down	?	32.8	30.5	14.7	44.5	48.1
South Suffolk	295	32.8	29.9	14.4	43.9	48.1
Sth Dorset Down	290	32.7	30.2	14.4	43.9	47.5
Cheviot	274	31.7	28.9	13.8	43.5	47.8
English Leicester	200	32.0	29.4	13.5	42.4	46.1
Ryeland	230	30.6	28.1	13.1	42.7	46.6
Lincoln	223	29.7	27.2	12.5	42.0	45.9
Merino	281	28.7	26.2	12.0	41.7	45.8
Estimated Ave 31.6 kg					43.4	47.3

Nicoll et al (1998) evaluated lambs from four breeds with carcass weights up to 25 kg. They found that Texel sired lambs had the highest DO% in virtually all slaughter groups (range = 43.32 to 49.8%) whereas Romney sired lambs were lower (range = 40.7 to 47.5; $p < 0.001$). Mean dressing out percentages were not given by these authors.

The data provided by On-Farm Research (Muir, unpublished data) provides DO% for approximately 6000 lambs from 15 ram breeds (Table 5). The differences between sire breeds were smaller than those observed by Kirton et al. (1995). This may be because no “extreme” sire breeds (e.g. merino) were included and because lambs were also drafted on fatness to avoid over-fat penalties. This may have reduced any sire effects.

Sheep- Lambs

Table 5. Effect of sire breed on DO% (Muir, unpublished data).

Breed of Sire	Number of lambs	DO% based on Estimated HCW [#] / LWP
Composite	438	0.45
Dorset Down	314	0.43
Dorper	61	0.45
East Friesian	77	0.44
Finn Texel cross	25	0.44
Growbulk	29	0.42
Oxford Down	54	0.44
Poll Dorset	1405	0.45
Poltex	94	0.43
Romney	890	0.43
Southdown	63	0.44
South Suffolk	174	0.43
Suffolk	1769	0.44
Texel	561	0.45
White Suffolk	33	0.43
Grand Total	5987	0.438

Cold carcass weight was multiplied by 1.0242 to provide estimated HCW. This value was derived from within the dataset, where both hot and cold carcass weights were known.

Effect of sex on DO% in lambs

The data from Poukawa (Muir, unpublished data) also provides the best estimate available of any sex differences in lambs from breeds under commercial conditions and with current carcass weights. A total of 2787 ewe lambs were slaughtered at an average weight of 38.8 kg and a DO of 44.6%. Being leaner, the 3412 ram lambs were slaughtered at heavier weights (average weight of 41.8 kg) with a DO of 43.2%. Overall mean was 43.8%.

Effect of time off feed on DO% in lambs

Bray (unpublished) provides some of the best data on the effect of time off feed on liveweight and DO% in groups of 10 lambs. The value of most interest is a dressing out percentage of 41.7 (HCW/LWP) for lambs straight off pasture. The data shows a clear trend for DO% to increase up to 24 hours off feed (Table 6). Considerable work was done by Kirton and others with smaller lambs than are normal today (Kirton, et al. 1968 and Appendix 1) but the trends were similar.

Sheep- Lambs

Table 6. Effect of time off feed on liveweight (kg) and DO% in lambs (Bray, unpublished data).

		Time off feed (hours)						
		0	2	4	6	10	21.5	24
Live Wt (kg)	Mean	25.5	25.2	24.8	24.4	24.3	23.4	23.3
	SD	1.93	1.92	1.97	1.76	1.91	1.74	1.73
DO%		41.7	42.3	43.0	43.8	44.0	45.7	45.8
	SD	1.71	1.65	1.79	1.80	1.62	1.70	1.60

Effect of wool on DO% in lambs

Kirton et al. (1984) published a significant study on the dressing percentages in lambs. Their work showed that at about 100 days of age down cross lambs had 0.8 kg wool, whereas Romney and English Leicester cross lambs had about 1.1 kg of wool. They noted that if these lambs had been slaughtered woolly instead of shorn, the DO% would have been reduced by just over one unit with the reduction being greater for long wool cross breeds than down cross lambs. More recent work (Devine et al., 1993⁴) showed 14 month old lambs of approximately 43 kg fasted liveweight had a DO% of 39.8 kg when shorn (2.96 kg wool) and 37.4% when woolly.

⁴ Additional data has been provided by Muir, to allow DO% calculations not presented in the published paper.

Sheep – adult

There is far less data available on dressing out percentage in adult sheep when compared with lambs (Table 7).

Table 7. Summary of DO% for adult sheep reported in the literature

Class	DO% Calculation not stated	Livewt (Pasture) : CCWt	Livewt (Starved) : CCWt	Livewt (Starved) : HCWt	Livewt (Pasture) : HCWt	Value used in a modelling exercise
Ewes		39.7 (1)	45.3 (1)	43.6 (1)	44.0 (2)	
Rams		43.3 (1)	44.1 (1)			50 (1)

Ewes

Three papers are summarised in Table 8. Kirton et al. (1985) provided DO% for cast for age Romney, Cheviot and Dorset x Romney ewes. Dressing out percentage (estimated HCW/LWP) averaged 39.9%. Bray (unpublished data) slaughtered 96 ewes, with a liveweight range from 45-69 kg and found an average DO% (HCW/LWP) of 38.3%. This DO% was essentially unaffected by the type of feed when hay (DO% 38.4%) or pasture (DO% 38.2%) when both feed types were fed at 1.5 x maintenance. This contrasts strongly with data from McCoard et al. (1996) who reported a DO% of 49.1% for spring lambing ewes (day 0 of pregnancy) and a DO% of 44.6% for autumn lambing ewes (day 0 of pregnancy). These authors only used 6 ewes per treatment and did not specify full or fasted liveweights. It seems reasonable to assume that these are fasted weights. Given the large difference between these estimates we suggest further research is warranted to establish a more accurate DO% for adult ewes.

Dairy cows

Table 8. Estimates of DO% in ewes

Authors	Breed	LWP kg	Carcass weight kg	Method of calculation of DO%			
				CCW : LWP	CCW : ELW	HCW : ELW	HCW: LWP
Kirton et al. 1985	Romney n=20	50.6	20.1 CCW	39.7	45.3		40.5 [#]
	Cheviot n=20	48.7	19.3 CCW	39.6	45.5		40.4 [#]
	Dorset x Romney n=20	47.7	18.2 CCW	38.2	44.1		38.9 [#]
Bray unpublished	Breed not stated n=96	56.9	21.8 HCW				38.3
McCoard et al. 1996	Romney n=6	58.5 Autumn lambing	26.1 HCW			44.6*	
		55.4 Spring lambing	27.2 HCW			49.1*	
[#] HCW was estimated from CCW plus 2% * McCoard et al. DO% calculations, assumed to be based on ELW not LWP.							

Rams

The only data on DO% in adult rams was presented by McCutcheon et al. (1993). Twenty six Romney rams (13 control and 13 from a fleece selected line) were weighed off pasture (DO% 43.3% CCW:LWP). If hot carcass weights had been collected it is likely that they would be about 2% heavier (Kirton, 1984; Muir, unpublished data) than the cold carcass weights recorded here. If that were the case, then the DO% would be 44.2% for a HCW:LWP estimation. This seems high given that young lambs only average 43.8%.

Dairy cows

There is a paucity of data on dressing out percentage in dairy cows. This is because there are no target weights (as with lambs) and cows are a by-product of the milk industry. There is little to be gained from weighing them prior to slaughter. There is some un-referenced US data available on a market based web site⁵ which indicates a range from 35% to 58% for DO% in Holstein-Friesian cows. From studies that have included dairy breeds and dairy crosses (Barton et al. 1994; Khadem et al. 1996; Knight and Death, 2000; Morris et al. 1992 & 1993; Muir et al. 2000) it is apparent that, in general, the DO% in dairy animals is lower than their beef counterparts.

Beef cattle, including dairy/beef crosses

Results from the papers covering cattle and dressing out percentage resulted in 46 records⁶ in the database. However only 9 of these were clearly referenced as full liveweight – hot carcass weight.

Table 9. Summary of DO% for cattle reported in the literature

Class	DO% Calculation not stated	Livewt (Pasture : CCWt	Livewt (Starved) : CCWt	Livewt (Starved) : HCWt	Livewt (Pasture) : HCWt	Value used in a published modeling exercise
Beef Cattle						
Cows						
Heifers	49.3 (6)					
Steers	52.6 (3)	51.8 (1)		56.4 (5)	53.3 (6)	
Bulls	53.3 (5)			56.9 (2)	53.7 (3)	50.0 (2)
Dairy Cattle						
Cows					?	

⁵ [http://agebb.missouri.edu/mkt/lvst/bull10\\$.htm](http://agebb.missouri.edu/mkt/lvst/bull10$.htm)

⁶ One research paper could result in more than one record in the database as more than one calculation of DO% may have been presented - either by method of calculation or sex or sometimes breed of animal.

Conclusions

Effect of diet on DO% in cattle

Cattle have a large rumen capacity⁷ and we might expect large differences between animals grazing on bulky fibrous feeds and those grazing on high quality ryegrass/white clover prior to slaughter (Preston and Willis 1970). Although there is only limited NZ data available on these effects, Morris et al. (1997) assessed the effect on DO% of grazing steers on concentrate plus straw, concentrate plus pasture and pasture alone for 30 days prior to slaughter (Table 10).

Table 10. Effect on DO% (HCW:ELW) in groups of 15 Angus cross steers fed concentrate plus straw, concentrate plus pasture and pasture alone for 30 days prior to slaughter.

	Concentrate (DMD ¹ 81%) plus straw (DMD 37%)	Concentrate (DMD 81%) plus pasture (DMD 52%)	Pasture alone (DMD 52%)	
ELW kg	546	548	547	NS
HCW	293	315	313	RSD ² 20
Fat Depth	6.5 ^a	10.2 ^b	9.7 ^b	
DO% (HCW:ELW)	53.6	57.4	57.2	
¹ DMD = Dry matter Digestibility				
² RSD = Residual Standard Deviation				

The inclusion of low quality straw in the diet reduced the DO%.

Effect of liveweight and fatness on DO% in cattle.

Preston and Willis (1970) state that the DO% of cattle increases as cattle get heavier. However, it appears more likely that it is related to the level of fatness of the animals – as cattle get heavier they also generally get fatter. The data from Morris et al. (1997) confirm the influence of fat on DO% (Table 10). Even though these animals had the same carcass weight, DO% increased as fat depth increased. Others have shown a less pronounced relationship between increasing fatness and increasing DO% (Muir et al. 1992, Muir et al. 2000).

Effect of sex on DO% in cattle.

Of the 9 beef cattle papers reporting DO% calculated as HCW:LWP (Table 9) there are 6 records involving steers and 3 with bulls. The 6 papers pertaining to steers have an average DO% of 53.3 and average carcass weights of 282 kg. Since average steer carcass weights were 317 kg in 2006/07 (MAF⁸) this DO% may actually understate the current situation. Similarly the 3 papers

⁷ <http://www.omafra.gov.on.ca/english/livestock/beef/facts/91-066.htm>

⁸ <http://www.maf.govt.nz/mafnet/rural-nz/statistics-and-forecasts/sonzaf/2007/tables-for-web-index.htm>

Conclusions

concerned with bulls have an average DO% of 53.7 for papers reporting an average carcass weight of 279 kg. Since the national average slaughter weights for bulls were 313 kg in 2006/07, the DO% may be slightly higher if the current animals being slaughtered are fatter as well as being heavier (Morris et al. 1997).

Table 11. Summary of DO% (HCW/LWP) from different classes of beef cattle

Type of Cattle	Literature	HCW	DO% (HCW:LWP)	DO% Average from the literature
Beef - Heifer				
Beef - Steer	Purchas et al. 1993 (10 Friesian cross steers)	253	48.3	53.3
	Purchas and Morris 2007	269	50.2	
		295	51.6	
	Muir et al. 2000	326	52.7	
	Johnson et al. 1986	170	53.0	
	Muir et al. 1992	389	53.4	
		316	56.7	
	358	51.6		
McMullan 1973	217	57.3		
	227	58.3		
	Mean	282kg	53.3	
Beef - Bull	Purchas et al. 1993	272	51.3	53.7
	Muir et al. 2006	270	53.7	
	Morris et al. 1992	295	56.2	
	Mean	279	53.7	
Beef - Cows	No NZ data obtained			

Effect of fasting on DO% in cattle

As with sheep, fasting and trucking also affects DO% (Johnson et al., 1986, Table 12). Values were based on 445 steers, over 4 years and show a consistent DO% for beef steers of around 53% for steers of a relatively light carcass weight (170 kg).

Conclusions

Table 12. The effect of fasting on DO% (Johnson, et al., 1986).

Sire breed	Dam breed	Liveweight off pasture prior to trucking to Abattoir & DO%		Liveweight just before slaughter, after an overnight fast & DO%		Hot carcass weight
		kg	DO%	kg	DO%	
Angus	Angus	295	52.2	283	54.4	154
Hereford	Angus	335	53.4	325	55.1	179
Angus	Hereford	330	53.6	319	55.5	177
Hereford	Hereford	322	52.2	312	53.8	168
Mean		321	53.0	310	54.8	170

Effect of breed on DO% in cattle.

Preston and Willis (1970) state that traditional beef breeds have higher DO% than dairy cattle, due to their higher fat content. This assertion is supported by NZ data presented here. Barton and Pleasants (1997) demonstrated that DO% in dairy breeds (49.9%) is consistently lower than the DO% in traditional beef breeds (53.2%; Table 13). Additional abattoir data is available (Table 14) that shows that Friesians tend toward a lower DO% than other breeds. As this DO% has been calculated from an empty liveweight collected prior to slaughter, the data is consistently higher than other reports.

Conclusions

Table 13. Effect of breed on DO% (Barton and Pleasants, 1997)

Dairy Breeds	Carcass Weight	DO%		Number of steers
Ayrshire	258	49.2	Mean of Dairy Breeds 49.9	30
Friesian	280	51.2		72
Jersey	211	48.6		29
Milking shorthorn	277	50.4		29
Beef Breeds			Mean of Beef breeds 53.2	
Angus	271	52.7		71
Galloway	252	53.3		29
Hereford	288	54.1		15
Beef Shorthorn	276	53.6		28
Red Poll	281	52.5		14
Mean	273.6	51.7		Total = 157

Table 14. Effect of breed on DO% (HCW:ELW) for cattle at Manawatu Beef Packers

Breed	Number of steers	Carcass weight Kg	Dressing out Percentage
Angus	13,853	314	56.3
Charolais	1,069	345	57.4
Limousin	648	330	57.2
Hereford	4,462	315	56.0
Simmental	3,045	331	56.6
Friesian	2,077	312	54.0

from <http://www.waikari.co.nz/theglencharolais/charolais.html> May 2008.

Beef cattle – mature cows

As with dairy cows, there is no data on beef cow DO%. However, Khadem et al. (1996) reported data from once bred Hereford x Friesian at 211 kg carcass, since these were 105 days pregnant with their second pregnancy they are more like cows than heifers. DO% was reported as 48.9%.

Conclusions

Deer

There were four papers on DO% in deer which provided 11 values for DO% (Table 15). There was some evidence that DO% increased on improved pastures (chicory, lotus and sulla = 57%) compared with more traditional ryegrass based pastures (54%). Average DO% (HCW:LWP) was 55.9% for stags and 55.6% for hinds. The overall DO% was 55.9%. The reason for the apparent anomaly here is that the database is using mixed sex values to calculate the average for the total, but these values are not included in either the stag or hind data.

Table 15. Effect of pasture on DO% in yearling hinds and stags.

Class of stock	Literature	Pasture type (no. animals)	HCW (kg)	DO% HCW:LWP	Mean DO%
Hinds	Min et al., 1997	Pasture (n=4)	48.5	55.2	55.2
	Hoskin et al., 1999	Pasture (n=4)	50.0	55.1	
	Min et al., 1997	Mean of chicory and lotus (n=8)	52.8	59.7	58.1
	Hoskin et al., 1999	Mean of chicory and sulla (n=6)	54.2	56.5	
Stags	Min et al. 1997	Pasture (n=8)	51	53.2	53.7
	Hoskin et al., 1999	Pasture (n=5)	57.9	54.2	
	Min et al., 1997	Mean of chicory and lotus (n=17)	55.6	56.6	56.2
	Hoskin et al. 1999	Mean of chicory and sulla	61.4	55.7	
Mixed sex	Kusmartono et al., 1995 ¹	Pasture, (no difference between reds and hybrids). n=15	56.8	54.1	56.1
		Chicory (Hybrids were 10 kg heavier carcass weight than reds) n=14	68.1	58.5	
	Hoskin et al., 2003	Mean of chicory and pasture n=68	33.8	55.8 ²	

¹ Assumed to be LWP, not ELW, ² HCW : ELW.

Conclusions

For this review, the focus has been on DO% calculated for hot carcass weight and liveweight measured directly off pasture. Many papers were of limited use because they did not provide enough information on the DO% calculation

Lambs: Whilst there is evidence for differences in DO% between lambs of different sex (Table 16), there is no differentiation of lamb carcasses at slaughter so there seems little point in having a separation based on sex. Therefore, we suggest the average lamb DO of 44% be adopted instead of the model's current figure of 45%. It is possible that there has been a slight change in DO% between 1990 and the present day as lamb carcass weights have increased and breed make up has changed. This could be an area of further analysis as it might demonstrate lighter lamb liveweights than those currently predicted by the methane inventory model (Clark et al. 2003).

Ewes: There are only three data sets (1 unpublished) pertaining to fresh liveweights and hot carcass weights in ewes. One estimate is very high and was obtained with a small number of light, shorn ewes and seems unrealistic. The other two estimates are 39.3% and 38.3% and when averaged provide us with an average DO of 38.8%. This is close to the figure for 40% observed for 9 month old lambs. We suggest that the ewe DO% be revised to 39% but given the likely contribution of ewe liveweight to the methane model it would seem appropriate to obtain a wider data set on ewe DO%.

Rams: The only figure in the literature for DO% in rams is 43.3% calculated using cold carcass weight. If we use the correction factors for hot to cold carcass weight (Kirton et al., 1984) we get a DO% of 44.2%. Whilst rams are likely to be more muscled and have a higher DO% than ewes (at 39%) it seems unlikely that rams would have a higher DO% than lambs (at 44%). We suggest that in the meantime a DO% of 39% be adopted – the same as recommended for ewes. It would seem prudent to collect more data but we note that rams will make a much smaller contribution to total sheep liveweight than do breeding ewes.

Dairy cows: There is no New Zealand data available for dairy cows to support the figure of 40% used in the methane model. An American website suggests an average of 52% for dairy cows with a range from 35% to 58% dependent on the fatness of the animal. There is also little data per se on other dairy animals as the data is usually presented in breed comparison involving a range of beef animals. Generally, the DO% of dairy animals is 2-3% lower than that for comparable beef breeds. Given the increasing importance of dairying, there is justification for further data on DO% for dairy cows.

Beef heifers: There are no good data reporting heifer DO%. However, since heifers will be fatter than steers and bulls, it seems reasonable that their DO% will be the same or higher than that of steers. For this reason we recommend adopting a DO% figure of 54% - the same being used for steers. A wider, international literature search of the DO% for heifers versus steers might provide a better resolution.

Conclusions

Beef steers: There is a reasonable amount of data on beef steers. The six trials produced an average DO% of 53.3% at an average carcass weight of 282 kg. Since average steer carcass weights were 317 kg in 2006/07 (MAF web site) it seems likely that the DO% in these heavier (and presumably fatter) would be slightly higher. We suggest that the figure of 50% being used in the methane model be increased to 54%.

Bulls: The 3 papers reporting full liveweight suggest an average DO% of 53.7% at a carcass weight of 279 kg. Since average bull slaughter weights were 313 kg for bull in the 2006/07 year it seems reasonable to assume that the actual DO% would be even higher in these heavier animals. We suggest a DO% of 54% be adopted for heifers, steers and bulls.

Beef cows: There are no data on beef cows but a single paper on light heifers which were over a third of the way through their second pregnancy gave DO% of 48.9%. This suggests that the 45% used in the methane model may be low. Given the contribution of approximately 1.5 million beef cows to methane production it would seem worthwhile to collect some data on beef cow DO%.

Deer: There are only four papers on deer DO% (HCW:LWP) with an average of 55.6. This indicates that the value of 55% used in the methane model could be increased slightly to 56%.

Conclusions

Table 16. Summary of DO% estimates for different livestock classes

Species	Category	Ave DO% from literature	Data used from the literature	Methane model	Proposed new value in model
Sheep	Ewe lambs	44.6	44.6	45	44
	Ram lambs	43.3	41.7, 42.5, 43.2, 44.6	45	44
	Wether lambs	44.2	43.6, 44.6, 44.7	45	44
	Mixed lambs	45.0	40.7, 43.8, 44.7, 45, 45.4, 45.8, 49.7	45	44
	Adult ewes	38.8	38.3, 39.3	43	39*
	Adult rams	44.1 ⁹		43	39*
Cattle	Dairy cows			40	No data
	Beef heifers			50	54
	Beef steers	53.3	48.3, 50.9, 53, 53.9, 57.3, 58.3	50	54
	Beef bulls	53.7	51.3, 53.7, 56.2	50	54
	Beef cows			45	49*
Deer	Hinds	55.6	55.1, 55.2, 56.5, 59.7	55	56
	Stags	54.9	53.2, 54.2, 55.7, 56.6	55	56
	Mixed	56.3	54.1, 58.5	55	56

* Proposed new figure based on very limited data. Suggest more data be collected.

⁹ Value was from McCutcheon et al. (1993) CCW:ELW

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Recommendations

1. That the data on DO% on lambs be re-analysed to determine if different DO% need to be used for the lighter lambs (e.g. 13.7 kg in 1990/91) compared to the heavier lambs (e.g. 17.5 kg in 2004/05).
2. Obtain better data on the DO% of beef and dairy cows and of ewes and rams.

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Annex 2 References – providing key detail, sorted by class of stock and authors – output from database

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1993

Relationships between objective and subjective measurements of carcass muscularity

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Sex: Male (entire)

Age: Mature

Age Weeks:

Dressing Out % 55.8 Range in values of DO% 52.0 - 61.1

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
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Fasted Liveweight:	kg	Cold Carcase Weight:	296 kg
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Number of animals (where stated): 90

Detail/explanation:-

MLC conformation classes were used- 2 animals were in the best (E) class, and recorded dressing out percentages of 61.1 (average). Class U with 28 animals recorded a DO% of 57.8; class R with 50 animals recorded a DO% of 55.2 and class O with 10 animals recorded a DO% of 52.0. Carcass weights were between 264 and 315 (averages in each class). Carcass weights are assumed to be cold carcass weights and the figure provided is an average of the 90 animals.

Barton, R. A.; Donaldson, J.J.; Barnes, F.R.; Jones, C.F.; Clifford, H.J.

1994

Comparison of Friesian, Friesian-Jersey-cross, and Jersey steers in beef production

New Zealand Journal of Agricultural Research 37:51-58

Sex: Male (castrated)

Age:

Age Weeks:

Dressing Out % 51.8 Range in values of DO% 51.2 - 52.2

Dressing Out % was based on: Liveweight (Pasture) : CCWt

Liveweight on Pasture:	416 kg	Hot Carcase Weight:	kg
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Fasted Liveweight:	kg	Cold Carcase Weight:	216 kg
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Number of animals (where stated):

Detail/explanation:-

This related to a beef operation, and therefore although the breeds are 'dairy' breeds, the intent was beef production.

Reference List - Sorted by Livestock and Authors
--

Barton, R.A.; Pleasants, A.B.

1997

Comparison of the carcass characteristics of steers of different breeds and pre-weaning environments slaughtered at 30 months of age

New Zealand Journal of Agricultural Research 40: 57-68

Sex: Male (castrated) Age: Mature Age Weeks: 130

Dressing Out % 51.7 Range in values of DO% 48.6 - 54.1

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):	317		

Detail/explanation:-

Dressing out percentage was the ratio of carcass weight to pre-slaughter liveweight.

Burke, J.L.; Purchas, R.W.; Morris, S.T.

1998

A comparison of growth, carcass, and meat characteristics of Jersey-and Friesian-cross heifers in a once-bred heifers system of beef production

New Zealand Journal of Agricultural Research 41: 91-99

Sex: Female Age: Age Weeks:

Dressing Out % 50 Range in values of DO% 48.7 - 51.3

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	447 kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	222 kg
Number of animals (where stated):	102		

Detail/explanation:-

Final liveweight was the liveweight on farm, prior to transport for slaughter. Unclear whether hot or cold carcass weight was used. Carcass weight (normal commercial conditions) was 222kg. Hereford Friesian cross heifers were 466kg and Hereford Jersey cross heifers were 427 kg.

Reference List - Sorted by Livestock and Authors
--

Candy, R.A.; McAdam, L.M.

1973

Development on the pumice in the Taupo area

Proceedings of the New Zealand Grassland Association, 35:182-187

Sex: Male (entire)

Age:

Age Weeks:

Dressing Out % 52 Range in values of DO%

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	199 kg

Number of animals (where stated):

Detail/explanation:-

Farmer results, dressing out calculation details not stated.

Carruthers, V.R.; Morris, C.A.

1988

Weights of some body organs from cattle selected for high and low susceptibility to bloat

Proceedings of the New Zealand Society of Animal Production 1988, 48

Sex: Mixed Sex

Age: Mature

Age Weeks:

Dressing Out % 52.7 Range in values of DO% 52.3 - 53.1

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	180 kg
Fasted Liveweight:	338 kg	Cold Carcase Weight:	kg

Number of animals (where stated): 82

Detail/explanation:-

The pre-slaughter liveweight, hot carcass weight, dressing out percentage, digesta weight and carcass composition of animals of high and low susceptibility to bloat was measured. Dressing out percentage was unaffected by bloat characteristics. Animals were starved for 12-16 hours. The dressing out percentage range is the range across the two groups.

Reference List - Sorted by Livestock and Authors
--

Cosgrove, G.P.; Knight, T.W.; Lambert, M.G.; Death, A.F.

1996

Effects of post-pubertal castration and diet on growth rate and meat quality of bulls

Proceedings of the New Zealand Society of Animal Production 56

Sex: Male (entire)

Age: Mature

Age Weeks:

Dressing Out % 55 Range in values of DO%

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	262 kg
Fasted Liveweight:	485 kg	Cold Carcase Weight:	kg
Number of animals (where stated):		10	

Detail/explanation:-

There were five treatments (n = 10); steers (castrated pre-puberty at 10 months of age) and castrates (castrated post-puberty at 17 months of age) on the feedlot, and bulls, steers and castrates on pasture. Bulls were castrated pre puberty (176 kg +/- 5kg LW) in July 1994, at 10 months of age (steers) or post-puberty (388 +/- 2 kg LW) in Jan 1995 at 17 months of age (castrates). Feeding tmts were commenced on 14 Feb 1995 and slaughter was in late may 1995. It is unclear if the data refer to hot or cold carcass weight, but it is almost certainly a hot carcass weight. Some further data is available for animals grazed on feedlots, but, the methodology of late castration means that these animals may be atypical of a normal steer in the std NZ situation.

Godley, W.C.; Godbey, E.G.; Kyzer, E.D.; Wheeler, R.F.

1960

Crossbred and pure bred dams for the production of slaughter calves

Journal of Animal Science, 19: 203-207

Sex: Mixed Sex

Age: Young

Age Weeks: 30

Dressing Out % 58.8 Range in values of DO% 58.2 - 59.8

Dressing Out % was based on: Liveweight (Starved) : CCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		167	

Detail/explanation:-

Various breeds, all sired by the same shorthorn bull and out of Angus, Brahman x Angus, Hereford x Angus and Brahman x Hereford cows. These matings produced calves which were slaughtered at 30 weeks. Average starved weight was 527 lb.

Reference List - Sorted by Livestock and Authors
--

**Jago, J.G.; Lasenby, R.R.; Trigg, T.E.; Claxton, P.D.; Matthews, L.R.; Bass, J.J.
1995**

**The effect of immunological castration on behaviour and growth of young bulls
Proceedings of the New Zealand Society of Animal Production 1995, 55:190-192**

Sex: Male (entire) Age: Young Age Weeks: 62

Dressing Out % 58.7 Range in values of DO%

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	325.1 kg
Fasted Liveweight:	554 kg	Cold Carcase Weight:	kg
Number of animals (where stated):		10	

Detail/explanation:-

Three groups, 10 in each, steers, immunocastrates and bulls. Friesian calves. This group were entire bulls.

**Jago, J.G.; Lasenby, R.R.; Trigg, T.E.; Claxton, P.D.; Mathews, L.R.; Bass, J.J..
1995**

**The effect of immunological castration on behaviour and growth of young bulls
Proceedings of the New Zealand Society of Animal Production 1995, 55:190-192**

Sex: Male (castrated) Age: Young Age Weeks: 62

Dressing Out % 58.8 Range in values of DO% 58 - 59.5

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	297 kg
Fasted Liveweight:	506 kg	Cold Carcase Weight:	kg
Number of animals (where stated):			

Detail/explanation:-

Three groups, 10 in each, steers, immunocastrates and bulls. Friesian calves. This group were the average of steers and immunocastrates, with the range shown. Fasted liveweight in Friesian immunocastrates was 525 and in steers it was 486 kg.

Reference List - Sorted by Livestock and Authors
--

Johnson, D.L.; Baker, R.L.; Morris, C.A.; Carter, A.H.; Hunter, J.C.

1986

Reciprocal crossbreeding of Angus and Hereford cattle. 2. Steer growth and carcass traits

New Zealand Journal of Agricultural Research. 29:433-441

Sex: Male (castrated) Age: Mature Age Weeks: 88

Dressing Out % 53 Range in values of DO% 52.2 - 53.6

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 321 kg Hot Carcase Weight: 170 kg

Fasted Liveweight: 310 kg Cold Carcase Weight: kg

Number of animals (where stated): 445

Detail/explanation:-

Data were set to a constant slaughter age of 618 days. Breeds being evaluated here were Angus and Hereford crosses. Refer text of literature review.

Johnson, D.L.; Baker, R.L.; Morris, C.A.; Carter, A.H.; Hunter, J.C.

1986

Reciprocal crossbreeding of Angus and Hereford cattle. 2. Steer growth and carcass traits

New Zealand Journal of Agricultural Research. 29:433-441

Sex: Male (castrated) Age: Mature Age Weeks: 88

Dressing Out % 54.8 Range in values of DO% 53.8 - 55.5

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture: 321 kg Hot Carcase Weight: 170 kg

Fasted Liveweight: 310 kg Cold Carcase Weight: kg

Number of animals (where stated): 445

Detail/explanation:-

Data were set to a constant slaughter age of 618 days. Breeds being evaluated here were Angus and Hereford crosses. Refer text of literature review.

Reference List - Sorted by Livestock and Authors
--

Khadem, A.A.; Purchas, R.W.; Morris, S.T.; McCutcheon, S.N.; Parker, W.J.

1994

Carcass and meat quality characteristics of pasture-fed unbred and once-bred Herefordx Friesian heifers

New Zealand Journal of Agricultural Research 38:187-196

Sex: Female

Age: Mature

Age Weeks:

Dressing Out % 48.9 Range in values of DO%

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture: 435 kg Hot Carcase Weight: kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 15

Detail/explanation:-

Bred heifers, (approx 6 months older than the unbred line) weighed off pasture and killed as per normal commercial conditions. Unclear if the value for carcass weight is hot or cold - 211 kg.

Khadem, A.A.; Purchas, R.W.; Morris, S.T.; McCutcheon, S.N.; Parker, W.J.

1994

Carcass and meat quality characteristics of pasture-fed unbred and once-bred Hereford X Friesian heifers

New Zealand Journal of Agricultural Research 38:187-196

Sex: Female

Age: Mature

Age Weeks:

Dressing Out % 51.1 Range in values of DO%

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture: 468 kg Hot Carcase Weight: kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 10

Detail/explanation:-

Unbred heifers, weighed off pasture and killed as per normal commercial conditions. Unclear if the value for carcass weight is hot or cold- 240 kg.

Reference List - Sorted by Livestock and Authors
--

Knight, T. W. ; Death, A.F.

2000

Reducing fat colour in beef by grazing steers on turnip bulbs

Proceedings of the New Zealand Society of Animal Production 60: 143-146.

Sex: Male (castrated) Age: Mature Age Weeks: 78

Dressing Out % 57 Range in values of DO% 56.1 - 57.7

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture: 495 kg Hot Carcase Weight: 268.5 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 30

Detail/explanation:-

Thirty 18-month old Angus and Angus crossbreed steers were randomly allocated to pasture (PS) and turnip (TS) groups. Carcass characteristics for steers grazing pasture (PS) and turnip bulbs (TS). Assumption is made that the carcass weight was a hot carcass weight. The calculation of DO% is either in error or the researchers used a fasted liveweight that is not provided in the data.

Knight, T. W.; Cosgrove, G.P.; Death, A.F.; Anderson, C.B.

2000

Effect of age of pre- and post-pubertal castration of bulls on growth rates and carcass quality

New Zealand Journal of Agricultural Research 43: 585-588

Sex: Male (castrated) Age: Mature Age Weeks: 346

Dressing Out % 56.3 Range in values of DO% 56.0 - 56.6

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture: kg Hot Carcase Weight: 289 kg

Fasted Liveweight: 518 kg Cold Carcase Weight: kg

Number of animals (where stated): 59

Detail/explanation:-

Steers castrated at birth had the highest DO% 56.6, while those castrated at 12 months had a DO% of 56.0- note, differences were not significant and have been averaged in data presented here.

Reference List - Sorted by Livestock and Authors
--

McMullan, M.J.

1973

Effects of subclinical parasitism on beef production

NZ Veterinary Journal 21:38-42.

Sex: Male (castrated) Age: Young Age Weeks: 35

Dressing Out % 57.3 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 378.9 kg Hot Carcase Weight: 217 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 19

Detail/explanation:-

Animals in this group were not treated with any products to control internal parasites.

McMullan, M.J.

1973

Effects of subclinical parasitism on beef production

NZ Veterinary Journal 21:38-42.

Sex: Male (castrated) Age: Young Age Weeks: 35

Dressing Out % 58.3 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 389.6 kg Hot Carcase Weight: 226.8 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 20

Detail/explanation:-

These were treated with thiabendazole three times during the trial.

Reference List - Sorted by Livestock and Authors
--

Morris, S.T.; Parker, W.J.; Purchas, R.W.; McCutcheon, S.N.

1992

Dairy crossbreeding alternatives to improve New Zealand beef production.

Proceedings of the New Zealand Grassland Association 54:19-22

Sex: Male (entire)

Age: Mature

Age Weeks:

Dressing Out % 56.2 Range in values of DO% 54.0 - 57.8

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	295 kg
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Fasted Liveweight:	kg	Cold Carcase Weight:	kg
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Number of animals (where stated):

Detail/explanation:-

Average dressing out percentages was given for bulls of Friesian (CWT= 285 kg; DO% = 54%), Belgian Blue x Friesian (CWT = 303 kg; DO% = 56.7%) and Piedmontese x Friesian crosses (CWT = 298 kg; DO% = 57.8%), killed at 17, 18 and 20 months. There is a possibility that the HCWt, recorded here, had 4.5% taken from it automatically, as these carcasses were weighed under standard commercial abattoir conditions. (Appears to have errors in the data- approx 480 kg at 18 months and 800 kg at 20 months?).

Morris, S.T.; PARKER, W.J.; Purchas, R.W. ; McCutcheon, S.N.

1992

Dairy crossbreeding alternatives to improve New Zealand beef production.

Proceedings of the New Zealand Grassland Association 54:19-22

Sex: Female

Age: Mature

Age Weeks: 130

Dressing Out % 50 Range in values of DO% 48.9 - 51.1

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	kg	Hot Carcase Weight:	226 kg
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Fasted Liveweight:	kg	Cold Carcase Weight:	kg
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Number of animals (where stated):

Detail/explanation:-

Non-mated heifers had a DO% of 48.9% while mated heifers had a DO% of 51.1%- the method of calculation was not stated, and it is unclear what the conditions of the 1966 trial were.

Reference List - Sorted by Livestock and Authors
--

Morris, S.T.; Parker, W.J.; Grant, D.A.

1993

Herbage intake, liveweight gain, and grazing behaviour of Friesian, Piedmontese x Friesian, and Belgian Blue x Friesian bulls

New Zealand Journal of Agricultural Research. 36(2):231-236

Sex: Male (entire) Age: Mature Age Weeks: 82

Dressing Out % 56.2 Range in values of DO% 53.8 - 57.9

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	526 kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		90	

Detail/explanation:-

Unfasted liveweight seems to be used, but unclear as to whether these data are based on hot or cold carcass. Dairy breed- (Friesian DO% = 53.8) were lower DO% than the beef breeds (Piedmontese x Friesian = 57.9 and Belgian Blue x Friesian bulls 57.0).

Morris, S.T.; Purchas, R.W.; Burnham, D.L.

1997

Short-term grain feeding and its effect on carcass and meat quality

Proceedings of the New Zealand Society of Animal Production 57:275

Sex: Male (castrated) Age: Mature Age Weeks:

Dressing Out % 53.6 Range in values of DO% 53.6 - 57.4

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	292.9 kg
Fasted Liveweight:	546 kg	Cold Carcase Weight:	kg
Number of animals (where stated):		15	

Detail/explanation:-

45 Angus cross steers were weighed and randomly allocated to three groups. The third group were on a feedlot for the month of the trial. Allocation of 8 kg of concentrate, and 2 kg of barley straw/hd/day. Barley straw digestability was 37%. Low dressing out percentage, as a result of steers consuming low quality barley straw. Others (Muir et al, 1992) found a similar trend in the early stage of feed lot feeding. Animals were growing at 0.33 kg/hd/day.

Reference List - Sorted by Livestock and Authors
--

Morris, S.T.; Purchas, R.W.; Burnham, D.L.

1997

Short-term grain feeding and its effect on carcass and meat quality

Proceedings of the New Zealand Society of Animal Production 57:275

Sex: Male (castrated) Age: Age Weeks:

Dressing Out % 57.2 Range in values of DO% 53.6 - 57.4

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	313 kg
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Fasted Liveweight:	547 kg	Cold Carcase Weight:	kg
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Number of animals (where stated): 15

Detail/explanation:-

45 Angus cross steers were weighed and randomly allocated to three groups. One group that grazed pasture alone- The DO% of 57.2 is for this, with a dry matter digestibility of 52% at an allowance to allow a liveweight gain of approximately 0.5 kg per day. Pasture alone group lost weight at a rate of -0.05 kg/hd/day. The second group grazed a similar pasture allowance, but were supplemented with a four kilograms per head per day of concentrate ration - the dry matter digestibility was 81%. The third group were penned on a feedlot and fed an allocation of 8 kg of concentrate, and 2 kg of barley straw/hd/day. Barley straw digestibility was 37%. Steers were slaughtered after 30 days of these treatments.

Morris, S.T.; Purchas, R.W.; Burnham, D.L.

1997

Short-term grain feeding and its effect on carcass and meat quality

Proceedings of the New Zealand Society of Animal Production 57:275

Sex: Male (castrated) Age: Mature Age Weeks:

Dressing Out % 57.4 Range in values of DO% 53.6 - 57.4

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	314.9 kg
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Fasted Liveweight:	548 kg	Cold Carcase Weight:	kg
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Number of animals (where stated): 15

Detail/explanation:-

45 Angus cross steers were weighed and randomly allocated to three groups. The second group grazed a similar pasture allowance to the first gp, but were supplemented with a four kilograms per head per day of concentrate ration - the dry matter digestibility was 81%. These animals grew at 0.42 kg/hd/day. Steers were slaughtered after 30 days of these treatments.

Reference List - Sorted by Livestock and Authors
--

Muir, P.D.; Fugle, C.J. Smith, N.B.; Ormond, A.W.A.

2001

A comparison of bull beef production from Friesian type and selected Jersey type calves.

Proceedings of the New Zealand Grassland Association 63: 203-207

Sex: Male (entire)

Age: Mature

Age Weeks:

Dressing Out % 54.3 Range in values of DO% 53.8 - 54.8

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
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Fasted Liveweight:	kg	Cold Carcase Weight:	kg
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Number of animals (where stated): 63

Detail/explanation:-

Friesian and Jersey cross type bulls were compared, grazed on a technosystem, on pasture. Carcass weights were 337 kg on average.

Muir, P.D.; Fugle, C.J.; Smith, N.B.; Ormond, A.W.A.

2001

A comparison of bull beef production from Friesian type and selected Jersey type calves.

Proceedings of the New Zealand Grassland Association 63: 203-207

Sex: Male (entire)

Age: Mature

Age Weeks: 126

Dressing Out % 52 Range in values of DO% 51.9 - 52.2

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
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Fasted Liveweight:	kg	Cold Carcase Weight:	kg
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Number of animals (where stated): 133

Detail/explanation:-

Friesian DO 51.9% at a carcass weight of 290 kg;

1/4 Jersey x 3/4 Friesian DO 52.2% at a carcass weight of 289 kg;

1/2 Jersey x 1/2 Friesian DO 51.9% at a carcass weight of 271 kg.

Reference List - Sorted by Livestock and Authors
--

Muir, P.D.; Nieuwenhuis, G.; Smith, N.B.; Ormond, A.W.A.

2000

A comparison of rearing systems for dairy beef calves.

Proceedings of the New Zealand Grassland Association, 62:9-11

Sex: Male (entire)

Age:

Age Weeks:

Dressing Out % 50 Range in values of DO%

Dressing Out % was based on: Value used in a Model

Liveweight on Pasture: kg Hot Carcase Weight: kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated):

Detail/explanation:-

Friesian bulls as a beef rearing enterprise- it appears that the DO% of 50% is one that was taken from the literature, not measured with these animals.

Muir, P.D.; Cruickshank, G.J.; Smith, N.B.; MacLean, K.S.; Wallace, G.J.

1992

A comparison of grain and pasture finishing of heavyweight cattle

Proceedings of the New Zealand Society of Animal Production 52:93-95

Sex: Male (castrated)

Age: Mature

Age Weeks:

Dressing Out % 56.7 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 558 kg Hot Carcase Weight: 316 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 10

Detail/explanation:-

10 rising three year old angus steers slaughtered, as part of a wider experiment. These animals had come in from hard feed on a truck and were weighed soon after being put out on pasture. The lack of total gut contents and capacity is shown by the relatively high DO%.

Reference List - Sorted by Livestock and Authors
--

**Muir, P.D.; Cruickshank, G.J.; Smith, N.B.; MacLean, K.S.; Wallace, G.J.
1992**

**A comparison of grain and pasture finishing of heavyweight cattle
Proceedings of the New Zealand Society of Animal Production 52:93-95**

Sex: Male (castrated) Age: Mature Age Weeks:

Dressing Out % 51.6 Range in values of DO% 51.2 - 51.9

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	695 kg	Hot Carcase Weight:	358 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		20	

Detail/explanation:-

Average of 20 steers, killed between 10 and 14 weeks into a trial, where this group were fed on high quality pasture. Angus beef steers were used.

**Muir, P.D.; Cruickshank, G.J.; Smith, N.B.; MacLean, K.S. Wallace, G.J.
1992**

**A comparison of grain and pasture finishing of heavyweight cattle
Proceedings of the New Zealand Society of Animal Production 52:93-95**

Sex: Male (castrated) Age: Mature Age Weeks:

Dressing Out % 53.4 Range in values of DO% 53.4 - 53.4

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	728 kg	Hot Carcase Weight:	389 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		20	

Detail/explanation:-

Twenty steers, fed for between 10 (10 steers) or 14 weeks (10 steers) on 70% maize and 30% pasture silage.

Reference List - Sorted by Livestock and Authors
--

Muir, P.D.; Thomson, B.C.; Fugle, C.J.

2006

The effect of colostrum intake on mortality and growth of Friesian bulls from birth to slaughter.

Proceedings of the New Zealand Society of Animal Production 66: 382

Sex: Male (entire) Age: Mature Age Weeks: 95

Dressing Out % 53.7 Range in values of DO% 53.2 - 53.9

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 499 kg Hot Carcase Weight: 270 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 45

Detail/explanation:-

Four day old Friesian bull calves, that had low, medium or high levels of colostrum were fed in a standard manner for 22 months and slaughtered. Results presented here are the average over the three groups, as there were no significant differences in DO%. Approximately 45 animals completed the trial - 42% of the low colostrum calves died.

Muir, P.D.; Smith, N.B.; Wallace, G.J.

1995

The cost of producing feedlot beef in New Zealand

Proceedings of the New Zealand Society of Animal Production 55:255

Sex: Mixed Sex Age: Mature Age Weeks:

Dressing Out % 53 Range in values of DO%

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture: kg Hot Carcase Weight: kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated):

Detail/explanation:-

The figure of 53% for dressing out was based on three experiments. Steers grew from 621 - 761 kg, 574- 674 kg, and 563 kg to 657 kg in experiments 1, 2 and 3, respectively. Average liveweight gains were 1.6 kg per day and average feed conversion efficiency was 9.5 kg feed to 1 kg of liveweight gain.

Reference List - Sorted by Livestock and Authors
--

Muir, P.D.; Smith, N.B.; Smith, D.R.; Ball, A.J.

1997

Effect of compensatory growth on production of carcasses to specification.

Recent Advances in Animal Nutrition 1997:260

Sex: Male (castrated)

Age:

Age Weeks:

Dressing Out % 59 Range in values of DO% 57.3 - 60.8

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
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Fasted Liveweight:	kg	Cold Carcase Weight:	521 kg
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Number of animals (where stated):	56
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Detail/explanation:-

Data provided by Muir allowed DO to be calculated - these data were not provided in the paper.

Ad lib Angus had DO% of 60.8% with LWt of 801kg.

Compensating Angus DO% of 57.3% and LWt of 812 kg.

Ad lib Simmental DO% 59.6% and LWt of 948kg.

Compensating simmental DO% 58.4% and LWt of 972 kg.

Muir, P.D.; Wallace, G.J.; Dobbie, P.M.; Bown, M.D.

2000

A comparison of animal performance and carcass and meet quality characteristics in Hereford, Hereford x Friesian, and Friesian steers grazed together at pasture

New Zealand Journal of Agricultural Research, 43:193-205

Sex: Male (castrated)

Age: Mature

Age Weeks: 117

Dressing Out % 52.7 Range in values of DO% 51.3 - 54.3

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	640 kg	Hot Carcase Weight:	326 kg
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Fasted Liveweight:	kg	Cold Carcase Weight:	kg
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Number of animals (where stated):	75
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Detail/explanation:-

75 animals were divided into 5 treatments, described in the literature review.

Reference List - Sorted by Livestock and Authors
--

Nicol, A.M.

1990

A simple dryland beef production system

Proceedings of the New Zealand Grassland Association 52:129-132

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 50 Range in values of DO%

Dressing Out % was based on: Value used in a Model

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg

Number of animals (where stated):

Detail/explanation:-

The author uses the value of 50% for dressing out, when estimating carcass weights at purchase from liveweight.

Purchas, R. W.; Morris, S.T.

2007

A comparison of carcass characteristics and meat quality for Angus, Hereford x Friesian, and Jersey x Friesian steers

Proceedings of the New Zealand Society of Animal Production 67:18-22

Sex: Male (castrated)

Age: Mature

Age Weeks: 117

Dressing Out % 50.2 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	542 kg	Hot Carcase Weight:	269 kg
Fasted Liveweight:	516 kg	Cold Carcase Weight:	kg

Number of animals (where stated): 15

Detail/explanation:-

The Jersey x Friesian animals (data for these presented here) had a slightly lower (sig. at 5% level) DO% than the Angus and Hereford x Friesian steers. It is likely that DO% is based on a hot carcass weight, that was adjusted for carcass weight differences.

Reference List - Sorted by Livestock and Authors
--

Purchas, R. W.; Morris, S.T.

2007

A comparison of carcass characteristics and meat quality for Angus, Hereford x Friesian, and Jersey x Friesian steers

Proceedings of the New Zealand Society of Animal Production 67:18-22

Sex: Male (castrated) Age: Mature Age Weeks: 117

Dressing Out % 51.55 Range in values of DO% 51.4 - 51.7

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 571 kg Hot Carcase Weight: 295 kg

Fasted Liveweight: 541 kg Cold Carcase Weight: kg

Number of animals (where stated): 29

Detail/explanation:-

Seems most likely that the DO% is based on a hot carcass weight. The range of DO% for Angus 51.7 and Hereford x Friesian steers (51.4) was not significantly different.

Purchas, R.W.; Keohane, B.E.

1997

Sources of variation in the ultimate pH of M. longissimus from prime steers

Proceedings of the New Zealand Society of Animal Production 1997, 57

Sex: Male (castrated) Age: Age Weeks:

Dressing Out % 56.6 Range in values of DO% 56.4 - 56.7

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture: kg Hot Carcase Weight: 341 kg

Fasted Liveweight: 603 kg Cold Carcase Weight: kg

Number of animals (where stated): 405

Detail/explanation:-

Seems most likely that this was a liveweight starved to hot carcass weight, but we cannot be entirely sure.

Reference List - Sorted by Livestock and Authors
--

Purchas, R.W.; Grant, D.A.

1995

Liveweight gain and carcass characteristics of bulls and steers farmed on hill country

New Zealand Journal of Agricultural Research 38:131-142

Sex: Male (entire) Age: Mature Age Weeks: 87

Dressing Out % 49.4 Range in values of DO% 48.7 - 50.0

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	525 kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		80	

Detail/explanation:-

Dressing out % for Friesian bulls at 48.8 was lower than Hereford x Friesian bulls (50.0); carcass weight on average was 264 kg- not sure if hot or cold carcass weight. Approx 87 weeks old. The range is from 48.7 - 50.0 as the animals dressed out at 50.0% when killed at 20 months, and 48.7 at 28 months.

Purchas, R.W.; Grant, D.A.

1995

Liveweight gain and carcass characteristics of bulls and steers farmed on hill country

New Zealand Journal of Agricultural Research 38:131-142

Sex: Male (castrated) Age: Mature Age Weeks: 87

Dressing Out % 49.2 Range in values of DO%

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	492 kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):			

Detail/explanation:-

Dressing out % for Friesian cross (Hereford x Angus) steers 49.2 was similar to the bulls in the study - not sure if hot or cold carcass weight was used in the calculation. Approx 87 weeks old.

Reference List - Sorted by Livestock and Authors
--

Purchas, R.W.; Thomson, N.A.; Waghorn, G.C.; Death, A.F.

1993

A comparison of carcass and meat characteristics and organ weights of castrate and entire male buffalo and cattle

Proceedings of the New Zealand Society of Animal Production 53: 407-411.

Sex: Male (castrated) Age: Mature Age Weeks: 126

Dressing Out % 48.3 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	527 kg	Hot Carcase Weight:	253 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		10	

Detail/explanation:-

10 Friesian cross steers - the authors list a number of other papers with similar findings- ie. Bulls dress out better than steers.

Purchas, R.W.; Thomson, N.A.; Waghorn, G.C.; Death, A.F.

1993

A comparison of carcass and meat characteristics and organ weights of castrate and entire male buffalo and cattle

Proceedings of the New Zealand Society of Animal Production 53: 407-411.

Sex: Male (entire) Age: Mature Age Weeks: 126

Dressing Out % 51.3 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	526 kg	Hot Carcase Weight:	272 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		16	

Detail/explanation:-

6 Friesian cross bulls - the authors list a number of other papers with similar findings- ie. Bulls dress out better than steers.

Reference List - Sorted by Livestock and Authors
--

Ridler, B.J.; Stachurski, L.J.; Brookes, I.M.

1988

Incorporation of Matua prairie grass into grazing systems

Proceedings of the New Zealand Grassland Association, 49:181-184

Sex: Male (entire)

Age:

Age Weeks:

Dressing Out % 50 Range in values of DO%

Dressing Out % was based on: Value used in a Model

Liveweight on Pasture: 465 kg Hot Carcase Weight: kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated):

Detail/explanation:-

The authors used these values in a model to assess profitability in a bull beef system.

Cattle (Dairy)

Robertson, Duane

2008

Missouri Dept. of Agriculture- Market Report for April 2008.

[http://agebb.missouri.edu/mkt/lvst/bull10\\$.htm](http://agebb.missouri.edu/mkt/lvst/bull10$.htm)

Sex: Female

Age: Mature

Age Weeks:

Dressing Out % 52 Range in values of DO% 35 - 58

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture: kg Hot Carcase Weight: kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated):

Detail/explanation:-

Slaughter cows in the USA- Jefferson City, Missouri:

	Percent lean	Avg Dressing	High dressing	Low dressing
Breaking	70-80	50.0 - 54.0	54.5 - 56.0	
Boning	80-85	50.0 - 54.0	54.5 - 58.0	
Lean	85-90	45.0 - 51.0	51.5 - 54.5	35.00-44.00

Clearly it is difficult to extrapolate from cows in the USA, with breaking, boning and lean categories- to determine how relevant these data are to the NZ situation. There is a need to research the situation for NZ conditions.

Deer

**Hoskin, S. O.; Barry, T.N.; Wilson, P.R.; Charleston, W.A.G.; Kemp, P.D.
1999**

Growth and carcass production of young farmed deer grazing sulla (*Hedysarum coronarium*), chicory (*Cichorium intybus*), or perennial ryegrass (*Lolium perenne*)/White clover (*Trifolium repens*) pasture in New Zealand

New Zealand Journal of Agricultural Research 42: 83-92

Sex: Male (entire) Age: Young Age Weeks:

Dressing Out % 54.2 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	57.9 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		5	

Detail/explanation:-

Hybrid hinds (0.75 red : 0.25 elk) were grazed on either Pasture or Sulla or chicory and dressing out percentage calculated. Data are for animals grazing pasture.

**Hoskin, S. O.; Barry, T.N.; Wilson, P.R.; Charleston, W.A.G.; Kemp, P.D.
1999**

Growth and carcass production of young farmed deer grazing sulla (*Hedysarum coronarium*), chicory (*Cichorium intybus*), or perennial ryegrass (*Lolium perenne*)/White clover (*Trifolium repens*) pasture in New Zealand

New Zealand Journal of Agricultural Research 42: 83-92

Sex: Female Age: Young Age Weeks:

Dressing Out % 55.1 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	50 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		4	

Detail/explanation:-

Deer grazing on pasture.

References on Deer, sorted by Authors

**Hoskin, S. O.; Barry, T.N.; Wilson, P.R.; Charleston, W.A.G.; Kemp, P.D.
1999**

Growth and carcass production of young farmed deer grazing sulla (*Hedysarum coronarium*), chicory (*Cichorium intybus*), or perennial ryegrass (*Lolium perenne*)/White clover (*Trifolium repens*) pasture in New Zealand

New Zealand Journal of Agricultural Research 42: 83-92

Sex: Male (entire) Age: Young Age Weeks:

Dressing Out % 55.7 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	61.4 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg

Number of animals (where stated):

Detail/explanation:-

Red and hybrid stags were grazed on either Pasture or Sulla or chicory and dressing out percentage calculated. These are the mean of sulla and chicory.

**Hoskin, S. O.; Barry, T.N.; Wilson, P.R.; Charleston, W.A.G.; Kemp, P.D.
1999**

Growth and carcass production of young farmed deer grazing sulla (*Hedysarum coronarium*), chicory (*Cichorium intybus*), or perennial ryegrass (*Lolium perenne*)/White clover (*Trifolium repens*) pasture in New Zealand

New Zealand Journal of Agricultural Research 42: 83-92

Sex: Female Age: Young Age Weeks:

Dressing Out % 56.5 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	54.2 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg

Number of animals (where stated): 6

Detail/explanation:-

Hybrid hinds (0.75 red : 0.25 elk) were grazed on either Pasture or Sulla or chicory and dressing out percentage calculated. Mean or chicory and sulla.

References on Deer, sorted by Authors

Hoskin, S.O.; Pomroy, W.R.; Reijrink, I.; Wilson, P.R.; Barry, T.N.

2003

Effect of withholding anthelmintic treatment on autumn growth and internal parasitism of weaner deer grazing perennial ryegrass-based pasture or chicory

Proceedings of the New Zealand Society of Animal Production 63:269-273

Sex: Mixed Sex

Age: Young

Age Weeks:

Dressing Out % 55.8 Range in values of DO% 53 - 58

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	33.8 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		68	

Detail/explanation:-

Weaner deer, grazed on chicory. Two treatments- anthelmintic at high or lower levels. Note the fasted liveweight is not given in the paper.

Kusmartono,; Barry, T.N.; Wilson, P.R.; Kemp, P.D.; Stafford, K.J.

1995

Nutritive value of chicory (*Cichorium intybus* L) for venison production

Proceedings of the New Zealand Society of Animal Production 55:169-173

Sex: Mixed Sex

Age: Young

Age Weeks:

Dressing Out % 54.1 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	105 kg	Hot Carcase Weight:	56.8 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		15	

Detail/explanation:-

A grazing trial using 24 Red and 24 Hybrid (0.75 Red/0.25 Elk) deer weaners was conducted from 1st March to 12th December 1993, to compare the feeding value of chicory (*Cichorium intybus* L) with that of perennial ryegrass (*Lolium perenne*) / white clover (*Trifolium repens*) pasture for increasing venison production by one year of age. Data presented here are for the animals grazing pasture. Red and hybrids showed no difference.

References on Deer, sorted by Authors

Kusmartono,; Barry, T.N.; Wilson, P.R.; Kemp, P.D.; Stafford, K.J.

1995

Nutritive value of chicory (*Cichorium intybus* L) for venison production

Proceedings of the New Zealand Society of Animal Production 55:169-173

Sex: Mixed Sex

Age: Young

Age Weeks:

Dressing Out % 58.5 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	116.4 kg	Hot Carcase Weight:	68.1 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		14	

Detail/explanation:-

A grazing trial using 24 Red and 24 Hybrid (0.75 Red/0.25 Elk) deer weaners was conducted from 1st March to 12th December 1993, to compare the feeding value of chicory (*Cichorium intybus* L) with that of perennial ryegrass (*Lolium perenne*) / white clover (*Trifolium repens*) pasture for increasing venison production by one year of age. Data presented here are for the animals grazing Chicory. Red and hybrids showed no difference. The Chicory pasture, improved dressing out percentage fr 54.1 (on the ryegrass/clover pasture) to 58.5%, when either Red or hybrids were grazing chicory.

Min, B.R.; Barry, T.N.; Wilson, P.R.; Kemp, P.D.

1997

The effects of grazing chicory (*Cichorium intybus*) and birdsfoot trefoil (*Lotus corniculatus*) on venison and velvet production by young red and hybrid deer

New Zealand Journal of Agricultural Research 40:335-347

Sex: Male (entire)

Age: Young

Age Weeks:

Dressing Out % 53.2 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	51 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		8	

Detail/explanation:-

Pure red deer and Hybrids (0.25 elk : 0.75 Red deer) were grazed on either pasture (ryegrass/white clover) or chicory or lotus.

Data here are for the red deer which had carcasses of between 48.6 and 56 kg. The average here is for the ryegrass/white clover. However, they showed that moving to improved pastures will increase DO%.

References on Deer, sorted by Authors

Min, B.R.; Barry, T.N.; Wilson, P.R.; Kemp, P.D.

1997

The effects of grazing chicory (*Cichorium intybus*) and birdsfoot trefoil (*Lotus corniculatus*) on venison and velvet production by young red and hybrid deer

New Zealand Journal of Agricultural Research 40:335-347

Sex: Male (entire)

Age: Young

Age Weeks:

Dressing Out % 56.6 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	55.6 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):	17		

Detail/explanation:-

Pure red deer and Hybrids (0.25 elk : 0.75 Red deer) were grazed on either pasture (ryegrass/white clover) or chicory or lotus. These data are the mean of chicory and lotus.

Min, B.R.; Barry, T.N.; Wilson, P.R.; Kemp, P.D.

1997

The effects of grazing chicory (*Cichorium intybus*) and birdsfoot trefoil (*Lotus corniculatus*) on venison and velvet production by young red and hybrid deer

New Zealand Journal of Agricultural Research 40:335-347

Sex: Female

Age: Young

Age Weeks:

Dressing Out % 59.7 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	52.8 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):	8		

Detail/explanation:-

Pure red deer and Hybrids (0.25 elk : 0.75 Red deer) were grazed on either pasture (ryegrass/white clover) or chicory or lotus.

Data here is for the mean of deer on chicory or lotus.

References on Deer, sorted by Authors

Min, B.R.; Barry, T.N.; Wilson, P.R.; Kemp, P.D.

1997

The effects of grazing chicory (*Cichorium intybus*) and birdsfoot trefoil (*Lotus corniculatus*) on venison and velvet production by young red and hybrid deer

New Zealand Journal of Agricultural Research 40:335-347

Sex: Female

Age: Young

Age Weeks:

Dressing Out % 55.2 Range in values of DO% 55.2 - 60.9

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	48.5 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		4	

Detail/explanation:-

The hybrid hinds (0.25 elk: 0.75 red deer) grazed either of the three pasture options, which included standard r/grass and white clover. These hinds grazed pasture.

Stevens, D.R.; Gibson, A.K.; Casey, M.J.

2000

Improving on-farm profitability of sheep and deer systems using pasture renewal in the southern South island

Proceedings of the New Zealand Grassland Association 62:201-205

Sex: Mixed Sex

Age: Young

Age Weeks:

Dressing Out % 52 Range in values of DO%

Dressing Out % was based on: Value used in a Model

Liveweight on Pasture:	kg	Hot Carcase Weight:	50 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):			

Detail/explanation:-

Hot carcass weight of 50 kg was an approximate mid point in the model.

Sheep (Adult)

Bray, A. (unpublished data)

2008

Factors affecting the reliability and accuracy of carcass weight measures as predicted from fasted or full liveweights in lambs and ewes

unpublished data.

Sex: Female

Age: Mature

Age Weeks:

Dressing Out % 43.6 Range in values of DO% 42.8 - 44.3

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture:	56.9 kg	Hot Carcase Weight:	21.8 kg
Fasted Liveweight:	50 kg	Cold Carcase Weight:	kg
Number of animals (where stated):		96	

Detail/explanation:-

96 ewes, (45-69 kg liveweight), breed not stated, fed on hay or pasture, at 1.5 x maintenance.

Bray, A. (unpublished data)

2008

Factors affecting the reliability and accuracy of carcass weight measures as predicted from fasted or full liveweights in lambs and ewes

unpublished data.

Sex: Female

Age: Mature

Age Weeks:

Dressing Out % 38.3 Range in values of DO% 38.2 - 38.4

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	56.9 kg	Hot Carcase Weight:	21.8 kg
Fasted Liveweight:	50 kg	Cold Carcase Weight:	kg
Number of animals (where stated):		96	

Detail/explanation:-

96 ewes, (45-69 kg liveweight), breed not stated, fed on hay or pasture, at 1.5 x maintenance

References on Adult Sheep, sorted by Authors
--

Kirton, A.H.; Dalton,; Winn; Duganzich.

1985

Body composition of cull Romney, Dorset x Romney, and Cheviot ewes from New Zealand hill country.

New Zealand Journal of Agricultural Research 28:241-247

Sex: Female

Age: Mature

Age Weeks:

Dressing Out % 39.7 Range in values of DO%

Dressing Out % was based on: Liveweight (Pasture) : CCWt

Liveweight on Pasture:	50.6 kg	Hot Carcase Weight:	kg
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Fasted Liveweight:	44.4 kg	Cold Carcase Weight:	20.1 kg
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Number of animals (where stated):	20
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Detail/explanation:-

Data for Romney ewes, culled for age, newly shorn, weighed directly off pasture.

Kirton, A.H.; Dalton,; Winn; Duganzich.

1985

Body composition of cull Romney, Dorset x Romney, and Cheviot ewes from New Zealand hill country.

New Zealand Journal of Agricultural Research 28:241-247

Sex: Female

Age: Mature

Age Weeks:

Dressing Out % 45.3 Range in values of DO%

Dressing Out % was based on: Liveweight (Starved) : CCWt

Liveweight on Pasture:	50.6 kg	Hot Carcase Weight:	kg
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Fasted Liveweight:	44.4 kg	Cold Carcase Weight:	20.1 kg
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Number of animals (where stated):	20
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Detail/explanation:-

This is for Romney ewes, which had been newly shorn and were cull ewes at maturity. They were weighed after an overnight fast.

References on Adult Sheep, sorted by Authors
--

McCoard, S.A.; Peterson, S.W.; Jenkinson, C.M.C.; Campbell, J.W.; McCutcheon, S.N.

1996

Seasonal effects on fetal growth in sheep

Proceedings of the New Zealand Society of Animal Production 56; 297

Sex: Female Age: Mature Age Weeks: 286

Dressing Out % 49.1 Range in values of DO%

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	55.4 kg	Hot Carcase Weight:	27.2 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg

Number of animals (where stated):

Detail/explanation:-

Study of fetal growth in sheep, mated for either autumn or spring lambing. Data are for day 0 of gestation with 6 (5-6 yr old Romney) ewes, killed in the Spring. The autumn killed animals had a lower DO%- 44.6. It seems likely that these animals were weighed after an overnight fast, (ELW) and the HCW used to calculate DO%.

McCoard, S.A.; Peterson, S.W.; Jenkinson, C.M.C.; Campbell, J.W.; McCutcheon, S.N.

1996

Seasonal effects on fetal growth in sheep

Proceedings of the New Zealand Society of Animal Production 56; 297

Sex: Female Age: Mature Age Weeks: 286

Dressing Out % 44.6 Range in values of DO%

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	58.5 kg	Hot Carcase Weight:	26.1 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg

Number of animals (where stated): 6

Detail/explanation:-

Study of fetal growth in sheep, mated for either autumn or spring lambing. Data are for day 0 of gestation with 6 (5-6 yr old Romney) ewes, killed in the Autumn. The spring killed animals had a higher DO%- 49.1. We assume these animals were weighed and killed after an overnight fast, but this isn't clear from the paper. Carcass weight is HCW.

References on Adult Sheep, sorted by Authors
--

McCutcheon, S.N.; Blair, H.T.; Purchas, R.W.

1993

Body composition and organ weights in fleeceweight-selected and control Romney rams

New Zealand Journal of Agricultural Research. 36:445-449

Sex: Male (entire) Age: Mature Age Weeks: 69

Dressing Out % 43.3 Range in values of DO%

Dressing Out % was based on: Liveweight (Pasture) : CCWt

Liveweight on Pasture: 47.6 kg Hot Carcase Weight: kg

Fasted Liveweight: 46.7 kg Cold Carcase Weight: 20.6 kg

Number of animals (where stated): 26

Detail/explanation:-

Two groups of 13 rams each (gp 1 romney control, and gp 2 were fleeceweight selected and all were slaughtered after a 12 hour fast. The carcasses were weighed after 12 hours chilling. Fleeceweight selection did not affect dressing out percentage.

McCutcheon, S.N.; Blair, H.T.; Purchas, R.W.

1993

Body composition and organ weights in fleeceweight-selected and control Romney rams

New Zealand Journal of Agricultural Research. 36:445-449

Sex: Male (entire) Age: Mature Age Weeks: 69

Dressing Out % 44.1 Range in values of DO%

Dressing Out % was based on: Liveweight (Starved) : CCWt

Liveweight on Pasture: 47.6 kg Hot Carcase Weight: kg

Fasted Liveweight: 46.7 kg Cold Carcase Weight: 20.6 kg

Number of animals (where stated): 13

Detail/explanation:-

Two groups of 13 rams each (gp 1 romney control, and gp 2 were fleeceweight selected and all were slaughtered after a 12 hour fast. Fasted liveweight is used to calculate DO%. The carcasses were weighed after 12 hours chilling. Fleeceweight selection did not affect dressing out percentage.

References on Adult Sheep, sorted by Authors
--

Purchas, R.W.

2000

A program to assess the efficiencies of sheep-meat production systems: a teaching aid

Proceedings of the New Zealand Society of Animal Production 60: 135-138

Sex: Female

Age: Mature

Age Weeks:

Dressing Out % 45 Range in values of DO% 39.0 - 53.0

Dressing Out % was based on: Value used in a Model

Liveweight on Pasture: kg Hot Carcase Weight: kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated):

Detail/explanation:-

The range of values for ewe dressing out percentage- from 39 - 53% is not discussed in this modelling paper.

Purchas, R.W.

2000

A program to assess the efficiencies of sheep-meat production systems: a teaching aid

Proceedings of the New Zealand Society of Animal Production 60: 135-138

Sex: Male (entire)

Age: Mature

Age Weeks:

Dressing Out % 50 Range in values of DO% 44 - 58

Dressing Out % was based on: Value used in a Model

Liveweight on Pasture: kg Hot Carcase Weight: kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated):

Detail/explanation:-

The range of values for ram dressing out percentage- from 44 - 58% is not discussed in this modelling paper.

Sheep (Lambs)

Bluett, S.J.; Hodgson, J.; Kemp, P.D.; Barry, T.N.

1997

Animal evaluation of Aries HD perennial rye grass selected for high digestibility

Proceedings of the New Zealand Grassland Association 59:245-249

Sex: Male (castrated)

Age:

Age Weeks:

Dressing Out % 45 Range in values of DO%

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	35.8 kg	Hot Carcase Weight:	kg
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Fasted Liveweight:	kg	Cold Carcase Weight:	kg
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Number of animals (where stated): 58

Detail/explanation:-

Weaned, Romney, wether lambs, carcass weights of 16.1 kg. The 35.8 kg liveweight ex pasture quoted here is based on a calculation from their data.

Bray, A. (unpublished data)

2008

Factors affecting the reliability and accuracy of carcass weight measures as predicted from fasted or full liveweights in lambs and ewes

unpublished data.

Sex: Male (entire)

Age: Young

Age Weeks:

Dressing Out % 41.7 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	25.5 kg	Hot Carcase Weight:	kg
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Fasted Liveweight:	kg	Cold Carcase Weight:	kg
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Number of animals (where stated): 10

Detail/explanation:-

10 Coopworth ram lambs, unshorn, DO% was 41.7 SD of 1.71. Note the low liveweight of these ram lambs.

References on Lambs, sorted by Authors

Brown, C.

1990

An integrated herbage system for Southland and South Otago

Proceedings of the New Zealand Grassland Association 52:119-122

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 40 Range in values of DO%

Dressing Out % was based on: Value used in a Model

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	13.6 kg

Number of animals (where stated):

Detail/explanation:-

Figures were obtained from Southland freezing works, processing 2 million lambs annually. Average carcass weight (cold) was 13.6 kg, and they quote a dressing out percentage of 40%. It is unclear, from the paper, whether this 40% is an actual measured value, or an estimate.

Deaker, J.M.; Young, M.J.; Fraser, T.J.; Rowarth, J.S.

1994

Carcass, liver and kidney characteristics of lambs grazing plantain (*Plantago lanceolata*), chicory (*Cichorium intybus*), white clover (*Trifolium repens*) or perennial ryegrass (*Lolium perenne*)

Proceedings of the New Zealand Society of Animal Production 54:197-200

Sex: Male (entire)

Age: Young

Age Weeks:

Dressing Out % 47.2 Range in values of DO% 45.1 - 48.2

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	18 kg
Fasted Liveweight:	37 kg	Cold Carcase Weight:	kg

Number of animals (where stated): 76

Detail/explanation:-

Seventy six, four month old Coopworth ram lambs, grazed on various pastures for 82 days, Jan to April. (24 hour fast prior to weighing and slaughter). DO% of 45.1 was recorded for lambs grazing ryegrass, while 48.2% was recorded for lambs grazing white clover.

Seventy-six Coopworth ram lambs were rotationally grazed either on Grasslands Lancelot plantain (n=17), Grasslands Puna chicory (n=20), Grasslands Huia white clover (n=19) or Grasslands Supemui perennial ryegrass (n=20) at an allowance averaging 1.8 kg green DM/lamb/day, for 82 days beginning 13 January. Lambs began grazing at 15 weeks of age and 23.4 (+/- 1.3, s.d.) kg fasted (24 hour) liveweight.

References on Lambs, sorted by Authors
--

Devine C.E., Graafhuis A.E., Muir, P.D.; Chrystall, B.B.

1993

The effect of growth rate and ultimate pH on meat quality of lambs.

Meat Science 35: 63-77

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 43.7 Range in values of DO%

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	17.5 kg
Fasted Liveweight:	40.1 kg	Cold Carcase Weight:	kg
Number of animals (where stated):		15	

Detail/explanation:-

Data are presented in Table 3 of the review.

These are the fasted liveweights. There were groups of 15 lambs in each treatment. Young lambs were produced from the same genotype of rams/ewes (born June) but grown fast to catch up with their slower growing older lambs produced the previous September. All lambs killed at same time the following January.

Average fleece weights for the 7 month old lambs were 2.44 kg and 2.96 kg for the 14 month old lambs.

7 month old lambs, shorn, with GR of 6.7, DO% = 43.7%. This is the gp presented here.

Older, 14 month old lambs that had grown more slowly, had a GR never greater than 4.9 and DO% of never more than 39.8%.

A key point is much greater DO% in fast growing fatter lambs (at the same carcass weight). This is not a weaning effect as they had been weaned for 3 months prior to slaughter.

Fennessy, P.F.; McEwan, J.C.; Lord, E.A.; Greer, G.J.; Bain, W.E.; Johnstone, P.D.

1990

Effect of Cimaterol implants on lamb growth and carcass traits.

New Zealand Journal of agricultural research 33:413-427

Sex: Mixed Sex

Age: Young

Age Weeks:

Dressing Out % 46 Range in values of DO% 43 - 52.6

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	18 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		126	

Detail/explanation:-

Data for dressing out was taken from animals that received no Cimaterol. ie. Control animals, there were 5 experiments. Coopworth and Suffolk x Coopworth lambs. 126 lambs over a total of 7 experiments. The 18 kg for hot carcass weight is an approximate figure only. Range from 13 kg to 23 kg.

References on Lambs, sorted by Authors

Fraser, T.J.; Scott, S.M.; Rowarth, J.S.

1996

Pasture species effects on carcass and meat quality

Proceedings of the New Zealand Grassland Association, 58:63-66

Sex: Mixed Sex

Age: Young

Age Weeks:

Dressing Out % 47.3 Range in values of DO% 45.2 - 48.3

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	kg	Hot Carcase Weight:	17.7 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg

Number of animals (where stated):

Detail/explanation:-

Hot carcass weights over three years and 5 pure pasture species (chicory, Plantain, white Clover, Lotus, rye grass)- were between 14.1 kg and 26 kg.

Garrick, D.J.; Purchas, R. W.; Morris, S. T.

1986

Consideration of alternative lamb drafting strategies

NZ Society of Animal Production 46:49-54

Sex: Mixed Sex

Age: Young

Age Weeks:

Dressing Out % 40.9 Range in values of DO% 40.5 - 41.3

Dressing Out % was based on: Value used in a Model

Liveweight on Pasture:	30 kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg

Number of animals (where stated):

Detail/explanation:-

The authors generated individual lamb weights using data from Kirton, 1984. The values used are provided here. Individual carcass weights (CCW) were generated for each lamb using the following regression equations for each sex:

Ram CCW = $-2.04 + 0.473 \text{ LWT}$

Wether CCW = $-1.92 + 0.473 \text{ LWT}$

Ewe CCW = $-1.80 + 0.473 \text{ LWT}$

A residual standard deviation 0.67 kg was included so that animals of the same live weight would have varying carcass weights. The average dressing out percentage for 30 kg live weight lambs were 40.5, 40.9 and 41.3 for rams, wethers and ewes, respectively (Kirton et al., 1984).

References on Lambs, sorted by Authors
--

Hickey, M.J.; Baxter, G.S.

1989

Winter feed value of 'Grasslands Moata' tetraploid Italian ryegrass in southland.

Proceedings of the New Zealand grassland Association 50:225-230

Sex: Male (entire)

Age:

Age Weeks:

Dressing Out % 42.4 Range in values of DO% 41.2 - 43.5

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
Fasted Liveweight:	51.5 kg	Cold Carcase Weight:	kg
Number of animals (where stated):		60	

Detail/explanation:-

60 Coopworth ram lambs in total, grazed in mobs of 30 on either Moata or Nui ryegrass. Weighed after overnight fast.

Holloway, I.J.; Purchas, R.W.; Power, M.T.; Thomson, N. A.

1994

A comparison of the carcass and meat quality of Awassi-cross and Texel-cross ram lambs

Proceedings of the New Zealand Society of Animal Production 54:209-213

Sex: Male (entire)

Age: Young

Age Weeks: 30

Dressing Out % 46.6 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	37.1 kg	Hot Carcase Weight:	17.3 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		36	

Detail/explanation:-

October born ram lambs, slaughtered in May of the following year. Liveweight ex pasture has been calculated from data provided.

References on Lambs, sorted by Authors
--

Holloway, I.J.; Purchas, R.W.; Power, M.T.; Thomson, N. A.

1994

A comparison of the carcass and meat quality of Awassi-cross and Texel-cross ram lambs

Proceedings of the New Zealand Society of Animal Production 54:209-213

Sex: Male (entire)

Age: Young

Age Weeks: 43

Dressing Out % 42.6 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 51.8 kg Hot Carcase Weight: 22.1 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 36

Detail/explanation:-

October born ram lambs, slaughtered in August of the following year. Liveweight ex pasture has been calculated from data provided. Dressing out percentage declined with age of these ram lambs. Awassi cross and texel cross lambs showed no breed effect on DO%. (mean = 44.6%).

Johnson, P.L.; Kenyon, P.R.; Burnham, D.L.; West, D.M.

2007

To wether - short scrotum or leave lambs as entire rams? Revisiting an old question using new genetics

Proceedings of the New Zealand Society of Animal Production 67:44-47

Sex: Male (castrated)

Age:

Age Weeks:

Dressing Out % 43.6 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 40.3 kg Hot Carcase Weight: 17.6 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 186

Detail/explanation:-

Slaughter was within 5 days of last weighing- this uncertainty makes the calculation here of less value than would otherwise be the case.

References on Lambs, sorted by Authors
--

Kirton, A. H., Bennett, G. L., Dobbie, J. L., Mercer, G. J. K., Duganzich, D. M.

1995

Effect of Sire Breed (Southdown, Suffolk), Sex, and Growth Path on Carcass Composition of Crossbred Lambs

New Zealand Journal of Agricultural Research, 38: 105-114

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 45.5 Range in values of DO% 43.9 - 47.2

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 37.6 kg

Hot Carcase Weight: 17.1 kg

Fasted Liveweight: 34.4 kg

Cold Carcase Weight: kg

Number of animals (where stated): 698

Detail/explanation:-

Suffolk and Southdown sires over Romney, Border Leicester x Romney and Coopworth and Coopworth x Romney) ewes- produced a total of 698 lambs assessed over two years- 1985 and 1986. Male lambs were converted to short scrotum. Lambs were fed differently, but slaughtered at the same target liveweight.

Kirton, A.H.; Carter, A.H.; Clarke, J.N.; Duganzich, D.M.

1984

Dressing percentage of lambs

Proceedings of the New Zealand Society of Animal Production 44:231-233

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 41 Range in values of DO%

Dressing Out % was based on: Liveweight (Pasture) : CCWt

Liveweight on Pasture: 32 kg

Hot Carcase Weight: kg

Fasted Liveweight: kg

Cold Carcase Weight: 13.2 kg

Number of animals (where stated):

Detail/explanation:-

This is an important paper and details of their research are given in the text of the review. The values provided here are those predicted from their regression equation, for a lamb of 32 kg, weighed straight off pasture.

References on Lambs, sorted by Authors
--

Kirton, A.H.; Clarke, J.N.; Carter, A.H.

1967

Effect of pre-slaughter fasting on liveweight, carcass weight, and carcass composition of Southdown ram lambs.

New Zealand Journal of Agricultural Research 10:43-55

Sex: Male (entire)

Age:

Age Weeks:

Dressing Out % 50.9 Range in values of DO%

Dressing Out % was based on: Liveweight (Starved) : HCWt

Liveweight on Pasture:	28.9 kg	Hot Carcase Weight:	13.6 kg
Fasted Liveweight:	26.7 kg	Cold Carcase Weight:	13.4 kg
Number of animals (where stated):	50		

Detail/explanation:-

Frozen carcasses were 13.2 kg, after two weeks of freezing. The cold carcass weight is after overnight chilling.

Kirton, A.H.; Moss, R.A.; Taylor, A.G.

1971

Weight losses from milk and weaned lambs in mid-Canterbury resulting from different lengths of starvation before slaughter

New Zealand Journal of Agricultural Research, 14:149-60

Sex: Mixed Sex

Age: Young

Age Weeks:

Dressing Out % 47.6 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	31.5 kg	Hot Carcase Weight:	15 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):	25		

Detail/explanation:-

Experiment one, studied weaned lambs. The hot carcass weight here was corrected for the 4.5% loss taken off automatically by the works scales. If the cold carcass weight was used in this instance, a value of 45.5% is obtained (CCWt/LWPt).

References on Lambs, sorted by Authors

Kirton, A.H.; Quarterman, A.R.; Uljee, A.E.; Carter, W.A.; Pickering, F.S.

1968

Effect of 1 and 2 days anti-mortem fasting on liveweight and carcass losses in lambs

New Zealand Journal of Agricultural Research 11: 891-902

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 46.3 Range in values of DO% 46.3 - 51.1

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	28.3 kg	Hot Carcase Weight:	13.1 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		25	

Detail/explanation:-

Wether and ewe lambs were used in the study. The range of 46.3 (control) up to 51.2 was developed by starving the animals for 1 or 2 days prior to slaughter. The figures used were always the liveweight off pasture against Hot carcass weight.

Lambs of approx. 12.8 kg hot carcass weight, lost on average 0.8 kg when weighed cold (In this case frozen).

The Literature review provides further details.

Lord, E.A.; Fennessy, P.F.; Littlejohn, R.P.

1988

Comparison of genotype and nutritional effects on body and carcass characteristics of lambs

New Zealand Journal of Agricultural Research 31:13-19

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 44.8 Range in values of DO% 44.5 - 45.0

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	kg	Hot Carcase Weight:	14 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		128	

Detail/explanation:-

Romney ewes mated to either Invermay lean or Invermay fat Coopworth rams. 128 wether and ewe lambs- body and carcass characteristics measured. Hot carcasses were weighed, unclear when live animals were weighed- off pasture or after 24 h fast? The range quoted for DO% is from two feed types- lotus or clover.

References on Lambs, sorted by Authors
--

Lord, E.A.; Fennessy, P.F.; Littlejohn, R.P.

1988

Comparison of genotype and nutritional effects on body and carcass characteristics of lambs

New Zealand Journal of Agricultural Research 31:13-19

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 44.7 Range in values of DO% 43.3 - 46.1

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture: kg Hot Carcase Weight: 14 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 128

Detail/explanation:-

Romney ewes mated to either Invermay lean or Invermay fat Coopworth rams. 128 wether and ewe lambs- body and carcass characteristics measured. Hot carcasses were weighed, unclear when live animals were weighed- off pasture or after 24 h fast? The range quoted for DO% is from the two allowances- 2 or 4 kg DM/hd/day.

Lord, E.A.; Fennessy, P.F.; Littlejohn, R.P.

1988

Comparison of genotype and nutritional effects on body and carcass characteristics of lambs

New Zealand Journal of Agricultural Research 31:13-19

Sex: Male (castrated)

Age:

Age Weeks:

Dressing Out % 44.4 Range in values of DO%

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture: kg Hot Carcase Weight: 14 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 64

Detail/explanation:-

Approx. 64 wether lambs as part of this trial.

References on Lambs, sorted by Authors
--

Lord, E.A.; Fennessy, P.F.; Littlejohn, R.P.

1988

Comparison of genotype and nutritional effects on body and carcass characteristics of lambs

New Zealand Journal of Agricultural Research 31:13-19

Sex: Female

Age:

Age Weeks:

Dressing Out % 45 Range in values of DO%

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture: kg Hot Carcase Weight: 14 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 64

Detail/explanation:-

Approx. 64 ewe lambs as part of this trial.

Montossi, F.; Hodgson, J.; Morris, S.T.; Risso, D.F.

1996

Effects of condensed tannins on animal performance in lambs grazing Yorkshire fog (*Holcus lanatus*) and annual ryegrass (*Lolium multiflorum*) dominant swards

Proceedings of the New Zealand Society of Animal Production 56:118

Sex: Male (castrated)

Age: Young

Age Weeks:

Dressing Out % 44.7 Range in values of DO% 44.3 - 44.9

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 40.3 kg Hot Carcase Weight: 18 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 96

Detail/explanation:-

Study was done in Uruguay using castrated Corriedale lambs. Pasture type and use of added tannin (twice daily oral administration of polyethylene glycol to half the lambs on the two swards) had no effect on dressing out percentage. The range quoted for DO% is the range given for the four treatments, not based on the 96 animals.

References on Lambs, sorted by Authors
--

Montossi, F.; Hodgson, J.; Morris, S.T.

1997

Herbage intake, injestive behaviour and diet selection, and effects of condensed tannins upon body and wool growth in lambs grazing Lolium perenne and Holcus lanatus swards in summer

New Zealand Journal of Agricultural Research 40:449-461

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 41.6 Range in values of DO% 40.5 - 42.6

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 40.7 kg Hot Carcase Weight: 16.9 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 64

Detail/explanation:-

NZ based trial- Mixed sex (ewes and wethers) Suffolk x Romney lambs with a mean (fasted) weight of 28.3 kg at the start of a 98 day feeding trial- where lambs either grazed ryegrass or yorkshire fog based pastures with white clover in both. We have calculated dressing out percentage from data provided. It seems clear that final live weight was fresh off pasture; Lambs were woolly at slaughter.

Muir, P.D. (Unpublished data)

2008

Poukawa Research data

unpublished data

Sex: Female

Age:

Age Weeks:

Dressing Out % 44.6 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 38.8 kg Hot Carcase Weight: 17.3 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 278

7

Detail/explanation:-

Hot carcass weight was estimated from a cold : hot relationship developed in a sub-set of the data.

References on Lambs, sorted by Authors
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Muir, P.D. (Unpublished data)

2008

Poukawa Research data

unpublished data

Sex: Male (entire)

Age:

Age Weeks:

Dressing Out % 43.2 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 41.8 kg Hot Carcase Weight: 18.1 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 341

2

Detail/explanation:-

Muir, P.D. (Unpublished data)

2008

Poukawa Research data

unpublished data

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 43.8 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture: 40.4 kg Hot Carcase Weight: 17.7 kg

Fasted Liveweight: kg Cold Carcase Weight: kg

Number of animals (where stated): 621

3

Detail/explanation:-

Further detail provided in body of Literature Review.

References on Lambs, sorted by Authors
--

Muir, P.D.; Wallace, G.J.; McCall, D.G.; Dodd, C.J.

1999

Effect of ewe milk production on profitability of dryland lamb production systems.

Proceedings of the New Zealand Grassland Association 61: 101-105

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 44.9 Range in values of DO% 42.7 - 47.5

Dressing Out % was based on: DO% Calculation not stated

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg

Number of animals (where stated):

Detail/explanation:-

Approx 90 ewes were grazed to generate the lamb data here. Low fecundity ewes produced lambs with a mean DO% of 45.6 and high fecundity ewes produced lambs with a DO% of 43.9.

Nicoll, G.B.; Skerritt, J.W.; Dobbie, J.L.; Grimwood, T.J.

1998

Effect of sire genotype on lamb growth and carcass productivity

Proceedings of the New Zealand Society of Animal Production 58:136-139

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 44.1 Range in values of DO% 40.7 - 47.5

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg

Number of animals (where stated): 173

Detail/explanation:-

Note that the final liveweight was taken from between 2-5 days prior to the slaughter of these animals. Dressing out percentage would therefore be under-estimated. Romney sired lambs from Romney ewes - these had a dressing percentage of from 40.7 to 47.5, no mean was given- an estimate only is made here.

References on Lambs, sorted by Authors
--

Nicoll, G.B.; Skerritt, J.W.; Dobbie, J.L.; Grimwood, T.J.

1998

Effect of sire genotype on lamb growth and carcass productivity

Proceedings of the New Zealand Society of Animal Production 58:136-139

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 46.6 Range in values of DO% 43.3 - 49.8

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		195	

Detail/explanation:-

Note that the final liveweight was taken from between 2-5 days prior to the slaughter of these animals. This would tend to ensure that the values here are somewhat lower than would be the case if animals had been weighed just prior to slaughter. Texel sired lambs from Romney ewes - these had the highest dressing percentage of the various breeds. The mean value was not given, but has been estimated from the range.

Johnson, P.L.; Kenyon, P.R.; Burnham, D.L.; West, D.M.

2007

To wether - short scrotum or leave lambs as entire rams? Revisiting an old question using new genetics

Proceedings of the New Zealand Society of Animal Production 67:44-47

Sex: Male (entire)

Age:

Age Weeks:

Dressing Out % 42.5 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	40.5 kg	Hot Carcase Weight:	17.2 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg
Number of animals (where stated):		185	

Detail/explanation:-

Slaughter was within 5 days of last weighing- this uncertainty makes the calculation here of less value than would otherwise be the case.

References on Lambs, sorted by Authors
--

Purchas, R.W.

2000

A program to assess the efficiencies of sheep-meat production systems: a teaching aid

Proceedings of the New Zealand Society of Animal Production 60: 135-138

Sex: Mixed Sex

Age: Young

Age Weeks:

Dressing Out % 43 Range in values of DO% 38.5 - 49.0

Dressing Out % was based on: Value used in a Model

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg

Number of animals (where stated):

Detail/explanation:-

Dressing-out percentage for lambs was adjusted so that it increased with increasing lamb liveweight. $DO\% = [Dressing\ out\ \%] + 4.69 - (150/FW) = 42\%$ when $FW = 32\text{ kg}$. (Where $FW =$ lamb liveweight at slaughter). They used a default value of 43%.

Scales, G. H., Bray, A. R., Baird, D. B., O'Connell, D., Knight, T. L.

2000

Effect of sire breed on growth, carcass, and wool characteristics of lambs born to Merino ewes in New Zealand.

New Zealand Journal of Agricultural Research, 43: 93-100.

Sex Mixed Sex

Age:

Age Weeks:

Dressing Out % 45 Range in values of DO%

Dressing Out % was based on: Liveweight(Pasture) : HCWt

Liveweight on Pasture:	kg	Hot Carcase Weight:	kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg

Number of animals (where stated): 108
0

Detail/explanation:-

The data here are for the lambs from merino ewes mated to a wide range of (meat breed) sires. (Purebred merinos had a lower DO% of 39. The difference was to a large extent explained by the lower liveweights and therefore carcass weights of the merinos. More complete results are given in body of review.

References on Lambs, sorted by Authors
--

Stevens, D.R.; Gibson, A.K.; Casey, M.J.

2000

Improving on-farm profitability of sheep and deer systems using pasture renewal in the southern South island

Proceedings of the New Zealand Grassland Association 62:201-205

Sex: Mixed Sex

Age:

Age Weeks:

Dressing Out % 42 Range in values of DO%

Dressing Out % was based on: Value used in a Model

Liveweight on Pasture:	kg	Hot Carcase Weight:	17.5 kg
Fasted Liveweight:	kg	Cold Carcase Weight:	kg

Number of animals (where stated):

Detail/explanation:-

Based on carcass weights varying between 15 and 20 kg- these were estimated using the 42% DO%.