Predicting Lamb Carcass Weight

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Factsheet

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INTRODUCTION

Lamb marketing is the main source of revenue for most Ontario sheep operations. It is an opportunity to maximize revenue from the lamb crop. There are marketing opportunities like forward contracting through a value chain, direct marketing to restaurants or farmers markets, or direct sales to consumers that can be used to increase revenue. In order to take advantage of these opportunities, it is important to be able to predict when lambs will be at the correct fat cover and carcass weight for the marketplace. This factsheet will describe the factors affecting dressing percentage and how to collect information that will build the skills needed to produce lambs that will meet target carcass weights. A companion OMAFRA factsheet, *Predicting Lamb Finishing Dates,* describes how to fat score market lambs.

Factors Affecting Dressing Percent

Dressing percent, or the weight of the carcass compared to the live weight, is important when selling direct or through a value chain when producers must meet target carcass weights. At live auction, buyers estimate the dressing percent of the lambs in the ring when they bid on lambs. Lambs that are thought to have a lower dressing percent will be bid on at a lower price. Missing the target weight range, when selling in a value chain, can result in price penalties or a missed opportunity to maximize financial return. This means that it is important for producers to understand what factors affect dressing percent.

Gut fill: One of the largest factors in dressing percent differences is the weight of the gut at weighing. Gut fill can vary between 10% and 22% of prefast live weight (Litherland, 2010). Feeds high in moisture won't be retained as gut fill for as long. The time off feed will affect gut fill. The Australian rules of thumb for changes in dressing percent related to time off feed are shown in Table 1.

Table 1. Effect of time off feed on dressing percent, due to gut fill

Hours	Effect on Dressing
0–3	0%
4–5	+ 1%
6–8	+ 2%
9–12	+ 2%–3%
13–24	+ 3.5%–4.5%

Source: *MLA Live Assessment Yard Book,* 2005.

Hide: The length of wool, moisture in the wool and manure attached to the wool (dags) will all affect the live weight and dressing percent. Meat and Livestock Australia reports that a 7.6-cm (3-in.) fleece too damp to shear will hold 0.2–0.5 kg of water (*MLA Live Assessment Yard Book*, 2005).

Muscling/breed/fatness: Animals with more lean muscle tend to have lower dressing percentages. As fat is added to the carcass, the internal organ weight stays relatively the same, resulting in more carcass weight compared to live weight. This means that breeds with larger mature weights or more muscling will have less fat at the same weight as a smaller breed or one with less muscling. Hopkins (1992) reported that in Dorset-sired lambs that weighed 35 kg, animals with a fat score of 2 had a dressing percent of 44%, whereas those with fat score of 4 had a dressing percent of 49.7%. Increases in fatness result in an increase in dressing percent. Litherland (2010) reported an increase of 0.45% in dressing percent for every increase of 1 mm at the girth rib (GR) site (11 cm off the midline on the 12th rib). Although Australian sheep are pasture based, the following table (Table 2) provides an idea of how the dressing percent changes with the fat score.

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Table 2. Australian dressing percent related to fat score*

Fat Score	Girth Rib (GR)	Unweaned	Weaned
1	1—5 mm	43%	41%
2	6–10 mm	45%	43%
3	11–15 mm	47%	45%
4	16–20 mm	49%	47%
5	21+ mm	51%	49%

Source: MLA Live Assessment Yard Book, 2005.

* Based on second cross lambs (Border Leicester Merino x Dorset) with wool length of about 2 in. Border Leicester/Merino and Merino lambs will dress 1.5%–3% less.

Live weight: As live weight increases, dressing percent increases for most breeds. However, the proportion of increase becomes greater at a diminishing rate (Hopkins, 1991). Litherland (2010) reported an average increase of 0.27% in dressing percent for each 1 kg increase in live weight.

Gender: At the same live weight, Litherland (2010) reported a 0.13%–0.3% higher dressing percent for ewes compared to wethers, but the same dressing percent at the same GR. Notter (1991) found that ram lambs were leaner, with a lower dressing percent than wethers or ewes. Tatum (1998) determined that ewe lambs reach the proper end point or finish at a weight 2.5 kg lighter than wether lambs.

Live weight gain: Litherland (2010) reported that at the same GR, dressing percent decreased by 0.7% for each increase of 100 g of live weight gain between weaning and finishing. At the same slaughter live weight, dressing percent decreased 1.6% per increase of 100 g of live weight gain, weaning to finish. Litherland also discussed that contrary to this finding, many published findings support that fast-growing lambs have higher dressing percentages. This is true given that "Lambs that grow faster to slaughter are often heavier, occasionally fatter and sometimes younger than their slower growing cohorts." (Litherland (2010), p. 125).

Carcass definition: Whether the carcass is hot or cold when weighed and what parts are included affect the carcass weight and dressing percent. Some rules of thumb are:

- add 4% for kidney and pelvic fat
- subtract 3% for a chilled carcass vs. a hot carcass

Scale calibration: Differences between scales or a malfunctioning or non-zeroed scale can cause changes to dressing percent. Retail scales are governed by Measurement Canada and must be certified and inspected. Farm scales should be properly zeroed and checked occasionally with a known weight to ensure the scale is weighing accurately.

These factors are the most common reasons for differences in dressing percent between animals. Some producers also report seasonal differences in average dressing percent on their farms.

Estimating Dressing Percent

To estimate dressing percent, you must know the live weight of an animal prior to slaughter and the carcass weight.

Dressing percent = carcass weight/live weight x 100.

Dressing percent may vary widely from farm to farm with similar animals, due to the factors already discussed. As a result, if you are marketing direct and aiming for a specific carcass weight, you must calculate dressing percentages on your own animals to determine what an average dressing percent is on your farm. Table 3 shows examples of this calculation.

To make the calculation, record the animal identification and live weight on farm before marketing. After receiving sale carcass weights, the dressing percent can be calculated for each animal, provided the carcass information includes the identification number of the live animal. This information can be analyzed to provide an idea of the range and average of dressing percent numbers on your farm, which can be used to determine what target live weights are needed to produce a particular carcass weight.

Table 3. Examples of dressing percent calculations

Animal	(A) Live Weight	(B) Carcass Weight	(B/A*100) Dressing
Example 1	108 lb (48.9 kg)	49.7 lb (22.5 kg)	46%
Example 2	98 lb (44.4 kg)	43.1 lb (19.5 kg)	44%

The tables in Appendix 1–3, can be used to determine what carcass weight will result from different live weights at different dressing percentages. For example, a lamb weighing 36 kg (80 lb) live will have a carcass weight of 17.1 kg (37.6 lb) if the dressing percent is 47%. These tables can be used to determine on average what live weight is needed to produce a particular carcass weight based on the average dressing percent calculated for the farm.

Selling Lambs on a Carcass Basis

When selling lambs on a carcass basis, there is a target carcass weight, a target fat range and a preferred muscling. In order to meet a target fat range, lambs must be live graded. To learn the correct feel for the target fat range, start with the fat scoring system described in the OMAFRA factsheet *Predicting Lamb Finishing Dates*. Then compare the estimated live scores to the actual fat depth at the GR site (11 cm (4 in.) off the midline at the 12th rib) on the carcass. Table 4 shows examples of records of live weight, estimated fat scores and comparisons to carcass measurements. Note that gender should be considered, as ewe lambs will be fatter at the same weight compared to ram lambs.

Record animal identification, live weight and fat score prior to marketing. Compare the fat score to the millimetres of fat actually on the carcass to determine what live score is going to produce lambs that meet the target fat range. Use the carcass weight and live weight to determine dressing percent. This information will allow you to fine tune the target live weights needed to produce lambs that best fit the target carcass weight range and millimetres of fat at the GR site.

Table 4. Examples of dressing percent calculations and fat score estimates

Animal	(A) Live Weight	Live Fat Score	(B) Carcass Weight	Fat	(B/A*100) Dressing
Example 1	108 lb (48.9 kg)	3	49.7 lb (22.5 kg)	14 mm	46%
Example 2	98 lb (44.4 kg)	2	43.1 lb (19.5 kg)	8 mm	44%

Most lambs sold on the rail or by carcass weight are sold in kilograms, and their carcass weights are reported in kilograms. In Ontario, market lambs are commonly weighed in pounds on farm, due to the fact that auction market prices are published in pounds. The table in Appendix 2 can be used to determine carcass weight at different dressing percentages for a live weight in the same way as Appendix 1. However, this table provides the live weight in pounds and the resulting carcass weight in kilograms. For example, an 80-lb live weight lamb that dresses 47% will result in a 17.1-kg carcass.

CONCLUSION

Producing a target carcass weight of lamb requires record keeping and attention to detail. Comparing live weights to carcass weights will provide an average dressing percent that can be used to determine a live weight range that can be used on the individual farm that will meet the target carcass weight. The dressing percent can be expected to vary between animals, farms and seasons due to a range of environmental and genetic factors.

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APPENDICES

The tables in the following appendices can be used to determine carcass weight of an animal using live weight and dressing percent. They can also be used to determine dressing percent from carcass weight and live weight. Three tables are provided for ease of use:

- Appendix 1 is for producers with live weight in pounds who have or are calculating carcass weight in pounds.
- Appendix 2 is for producers with live weight in pounds who receive or need to calculate carcass weight in kilograms.
- Appendix 3 is the same table in kilograms of live weight and carcass weight.

Appendix 1: Carcass weight in pounds, calculated from different live weights in pounds, at different dressing percentages

Live Weight (lb)	Dressing Percent											
	40%	41%	42%	43%	44%	45%	46%	47%	48%	49%	50%	51%
80	32.0	32.8	33.6	34.4	35.2	36.0	36.8	37.6	38.4	39.2	40.0	40.8
82	32.8	33.6	34.4	35.3	36.1	36.9	37.7	38.5	39.4	40.2	41.0	41.8
84	33.6	34.4	35.3	36.1	37.0	37.8	38.6	39.5	40.3	41.2	42.0	42.8
86	34.4	35.3	36.1	37.0	37.8	38.7	39.6	40.4	41.3	42.1	43.0	43.9
88	35.2	36.1	37.0	37.8	38.7	39.6	40.5	41.4	42.2	43.1	44.0	44.9
90	36.0	36.9	37.8	38.7	39.6	40.5	41.4	42.3	43.2	44.1	45.0	45.9
92	36.8	37.7	38.6	39.6	40.5	41.4	42.3	43.2	44.2	45.1	46.0	46.9
94	37.6	38.5	39.5	40.4	41.4	42.3	43.2	44.2	45.1	46.1	47.0	47.9
96	38.4	39.4	40.3	41.3	42.2	43.2	44.2	45.1	46.1	47.0	48.0	49.0
98	39.2	40.2	41.2	42.1	43.1	44.1	45.1	46.1	47.0	48.0	49.0	50.0
100	40.0	41.0	42.0	43.0	44.0	45.0	46.0	47.0	48.0	49.0	50.0	51.0
102	40.8	41.8	42.8	43.9	44.9	45.9	46.9	47.9	49.0	50.0	51.0	52.0
104	41.6	42.6	43.7	44.7	45.8	46.8	47.8	48.9	49.9	51.0	52.0	53.0
106	42.4	43.5	44.5	45.6	46.6	47.7	48.8	49.8	50.9	51.9	53.0	54.1
108	43.2	44.3	45.4	46.4	47.5	48.6	49.7	50.8	51.8	52.9	54.0	55.1
110	44.0	45.1	46.2	47.3	48.4	49.5	50.6	51.7	52.8	53.9	55.0	56.1
112	44.8	45.9	47.0	48.2	49.3	50.4	51.5	52.6	53.8	54.9	56.0	57.1
114	45.6	46.7	47.9	49.0	50.2	51.3	52.4	53.6	54.7	55.9	57.0	58.1
116	46.4	47.6	48.7	49.9	51.0	52.2	53.4	54.5	55.7	56.8	58.0	59.2
118	47.2	48.4	49.6	50.7	51.9	53.1	54.3	55.5	56.6	57.8	59.0	60.2
120	48.0	49.2	50.4	51.6	52.8	54.0	55.2	56.4	57.6	58.8	60.0	61.2
122	48.8	50.0	51.2	52.5	53.7	54.9	56.1	57.3	58.6	59.8	61.0	62.2
124	49.6	50.8	52.1	53.3	54.6	55.8	57.0	58.3	59.5	60.8	62.0	63.2
126	50.4	51.7	52.9	54.2	55.4	56.7	58.0	59.2	60.5	61.7	63.0	64.3
128	51.2	52.5	53.8	55.0	56.3	57.6	58.9	60.2	61.4	62.7	64.0	65.3
130	52.0	53.3	54.6	55.9	57.2	58.5	59.8	61.1	62.4	63.7	65.0	66.3

Appendix 2: Carcass weight in kilograms, calculated from different live weights in pounds, at different dressing percentages

Live Weight (lb)	Dressing Percent											
	40%	41%	42%	43%	44%	45%	46%	47%	48%	49%	50%	51%
80	14.5	14.9	15.3	15.6	16.0	16.4	16.7	17.1	17.5	17.8	18.2	18.5
82	14.9	15.3	15.7	16.0	16.4	16.8	17.1	17.5	17.9	18.3	18.6	19.0
84	15.3	15.7	16.0	16.4	16.8	17.2	17.6	17.9	18.3	18.7	19.1	19.5
86	15.6	16.0	16.4	16.8	17.2	17.6	18.0	18.4	18.8	19.2	19.5	19.9
88	16.0	16.4	16.8	17.2	17.6	18.0	18.4	18.8	19.2	19.6	20.0	20.4
90	16.4	16.8	17.2	17.6	18.0	18.4	18.8	19.2	19.6	20.0	20.5	20.9
92	16.7	17.1	17.6	18.0	18.4	18.8	19.2	19.7	20.1	20.5	20.9	21.3
94	17.1	17.5	17.9	18.4	18.8	19.2	19.7	20.1	20.5	20.9	21.4	21.8
96	17.5	17.9	18.3	18.8	19.2	19.6	20.1	20.5	20.9	21.4	21.8	22.3
98	17.8	18.3	18.7	19.2	19.6	20.0	20.5	20.9	21.4	21.8	22.3	22.7
100	18.2	18.6	19.1	19.5	20.0	20.5	20.9	21.4	21.8	22.3	22.7	23.2
102	18.5	19.0	19.5	19.9	20.4	20.9	21.3	21.8	22.3	22.7	23.2	23.6
104	18.9	19.4	19.9	20.3	20.8	21.3	21.7	22.2	22.7	23.2	23.6	24.1
106	19.3	19.8	20.2	20.7	21.2	21.7	22.2	22.6	23.1	23.6	24.1	24.6
108	19.6	20.1	20.6	21.1	21.6	22.1	22.6	23.1	23.6	24.1	24.5	25.0
110	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5
112	20.4	20.9	21.4	21.9	22.4	22.9	23.4	23.9	24.4	24.9	25.5	26.0
114	20.7	21.2	21.8	22.3	22.8	23.3	23.8	24.4	24.9	25.4	25.9	26.4
116	21.1	21.6	22.1	22.7	23.2	23.7	24.3	24.8	25.3	25.8	26.4	26.9
118	21.5	22.0	22.5	23.1	23.6	24.1	24.7	25.2	25.7	26.3	26.8	27.4
120	21.8	22.4	22.9	23.5	24.0	24.5	25.1	25.6	26.2	26.7	27.3	27.8
122	22.2	22.7	23.3	23.8	24.4	25.0	25.5	26.1	26.6	27.2	27.7	28.3
124	22.5	23.1	23.7	24.2	24.8	25.4	25.9	26.5	27.1	27.6	28.2	28.7
126	22.9	23.5	24.1	24.6	25.2	25.8	26.3	26.9	27.5	28.1	28.6	29.2
128	23.3	23.9	24.4	25.0	25.6	26.2	26.8	27.3	27.9	28.5	29.1	29.7
130	23.6	24.2	24.8	25.4	26.0	26.6	27.2	27.8	28.4	29.0	29.5	30.1

Appendix 3: Carcass weight in kilograms, calculated from different live weights in kilograms, at different dressing percentages

Live Weight (kg)	Dressing Percent											
	40%	41%	42%	43%	44%	45%	46%	47%	48%	49%	50%	51%
36	14.4	14.8	15.1	15.5	15.8	16.2	16.6	16.9	17.3	17.6	18.0	18.4
38	15.2	15.6	16.0	16.3	16.7	17.1	17.5	17.9	18.2	18.6	19.0	19.4
40	16.0	16.4	16.8	17.2	17.6	18.0	18.4	18.8	19.2	19.6	20.0	20.4
42	16.8	17.2	17.6	18.1	18.5	18.9	19.3	19.7	20.2	20.6	21.0	21.4
44	17.6	18.0	18.5	18.9	19.4	19.8	20.2	20.7	21.1	21.6	22.0	22.4
46	18.4	18.9	19.3	19.8	20.2	20.7	21.2	21.6	22.1	22.5	23.0	23.5
48	19.2	19.7	20.2	20.6	21.1	21.6	22.1	22.6	23.0	23.5	24.0	24.5
50	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5
52	20.8	21.3	21.8	22.4	22.9	23.4	23.9	24.4	25.0	25.5	26.0	26.5
54	21.6	22.1	22.7	23.2	23.8	24.3	24.8	25.4	25.9	26.5	27.0	27.5
56	22.4	23.0	23.5	24.1	24.6	25.2	25.8	26.3	26.9	27.4	28.0	28.6
58	23.2	23.8	24.4	24.9	25.5	26.1	26.7	27.3	27.8	28.4	29.0	29.6
60	24.0	24.6	25.2	25.8	26.4	27.0	27.6	28.2	28.8	29.4	30.0	30.6

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