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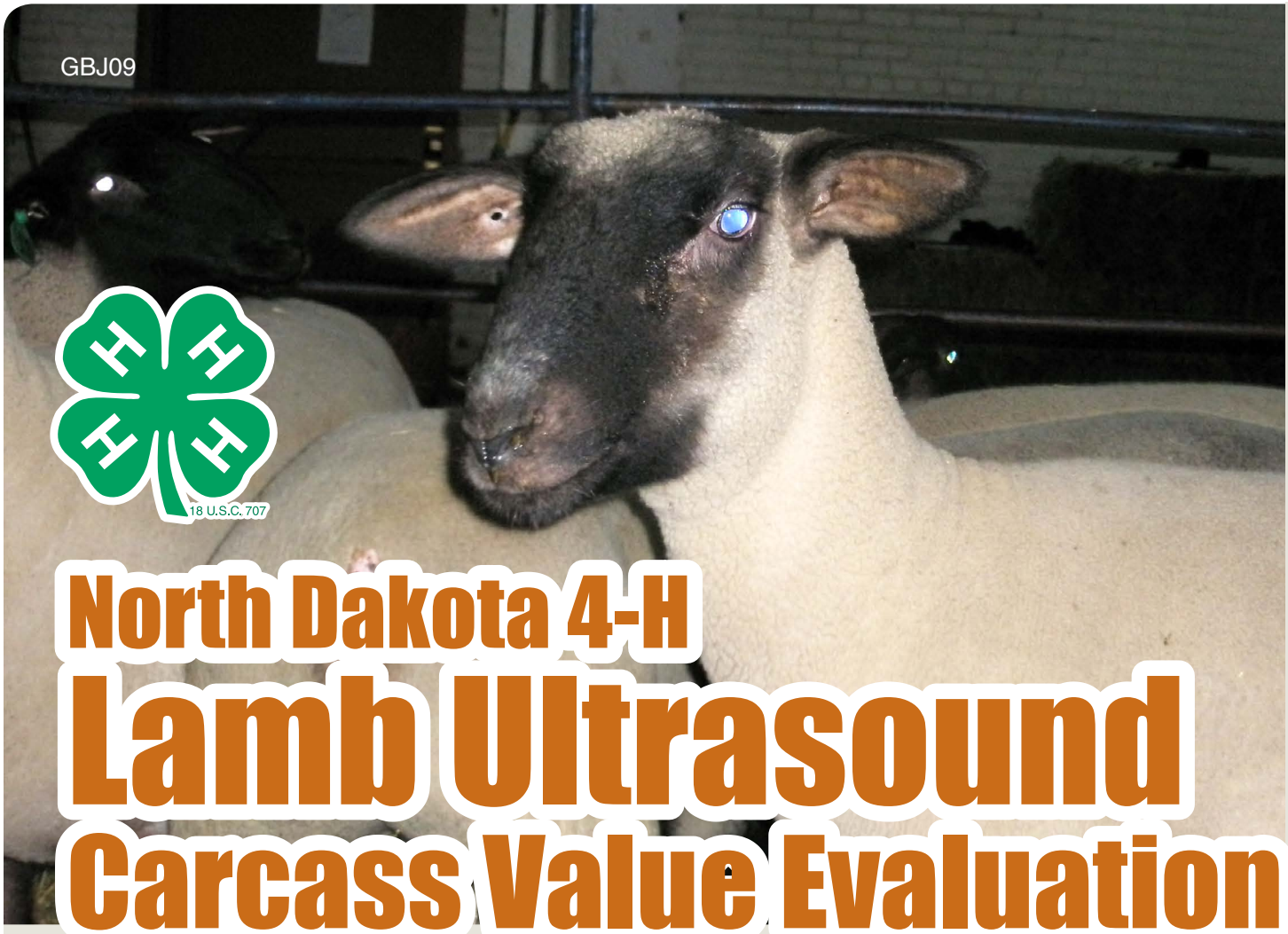

North Dakota 4-H Lamb Ultrasound Carcass Value Evaluation

Rob Maddock, NDSU Meat Specialist
Reid Redden, NDSU Sheep Specialist
Christopher Schauer, Director
Hettinger Research Extension Center

The ultimate value of lamb is determined by the yield and quality of the carcass. This system was developed to evaluate the carcass merit of 4-H club lambs using data from ultrasound scans. Lambs are weighed and assigned a leg score, and loin muscle area, fat thickness and body wall thickness ultrasound measurements are taken between the 12th and 13th rib. The data gathered will be used to evaluate the carcass value of lambs.

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Carcass Traits

Carcass traits used to evaluate lamb carcasses are based on industry standards for dressing percentage and ultrasound measurements of fat and muscling.

- **Hot carcass weight and dressing percentage:** The weight of the carcass after slaughter is referred to as hot carcass weight. The relationship between live weight and hot carcass weight is called dressing percentage, which is figured by dividing hot carcass weight by live weight. For lambs, the dressing percentage can vary between 45 and 57 percent. For this evaluation, we used a value of 54 percent, which is based on research data from club lambs. For example, a 150-pound lamb is estimated to have a hot carcass weight of 81 pounds (150 pounds x 54 percent).
- **Backfat thickness:** This is the thickness of the fat from the ribeye muscle to the outer surface of the carcass measured at the midpoint of the ribeye muscle at the 12th rib location (Figure 1). Backfat thickness is the only factor used in the assignment of yield grades. Figure 1 illustrates the location of the backfat measurement over the center of the ribeye, between the 12th and 13th ribs. Fat thickness may be adjusted up or down to account for unusual fat distribution at the point of measurement. Backfat on carcasses usually ranges from 0.1 to 0.5 inch.
- **Body wall thickness:** This is a measurement across the lean, bone and fat of the lower rib 5 inches from the midline of the carcass (Figure 1). This area accumulates excess fat in some animals and is an indicator of expected trimmed cut yield from the carcass. Body wall thickness usually ranges from 0.5 to 1.2 inches.
- **Ribeye area (REA):** This is an objective measure of muscling in lambs and is measured in square inches between the 12th and 13th ribs (Figure 1). REA measurements usually range from 1.5 to 4.0 square inches. REA is affected by the weight and muscularity of the live animal and provides a good estimate of the percentage of lean to bone in the carcass.
- **USDA yield grade:** U.S. Department of Agriculture yield grades are calculated by using the following formula: YG = 0.4 + (10 × adj. fat thickness). USDA yield grades (1, 2, 3, 4, 5) categorize carcasses into groups according to the expected yield of trimmed, retail cuts. Yield grade 1 has the highest expected yield and 5 the lowest. For example, a lamb with 0.15 inch of backfat will have a USDA yield grade of 1.9 (0.4 + (10 x 0.15).

1 describes the assignment of yield grades based on backfat ranges and the average yield of semiboneless cuts for each yield grade.

Table 1. Lamb Carcass Yield Grade Information.

Yield Grade	Backfat Range	Average Estimated % Semiboneless Yield
1	0.15 inch and less	50.3
2	0.16 to 0.25 inch	49.0
3	0.26 to 0.35 inch	47.7
4	0.36 to 0.45 inch	46.4
5	0.46 inch and greater	45.1

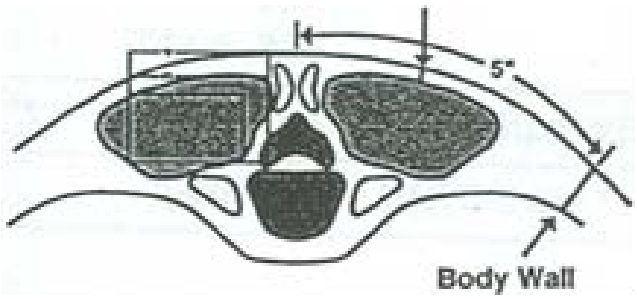

Figure 1. Locations of measurement of ribeye area, backfat thickness and body wall thickness are shown in this figure, which represents a cross section of the lamb carcass at the 12th rib. Ribeye area is the area of the longissimus muscle (ribeye).

- **Leg scores (Figure 2):** These are used to evaluate muscling subjectively. Variations in leg score do not affect yield grade but are used to evaluate the attractiveness and lean yield of the lamb carcass. Leg scores usually range from 15 (very thick muscling) to 9 (thin muscling). A leg score of 12 is considered average for lamb leg muscling (slightly thick muscling).

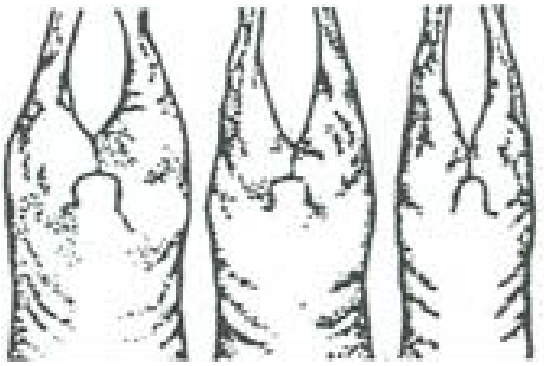

Figure 2. Examples of three leg scores are shown in Figure 2, with the thickest leg being a leg score 14, the middle example being a leg score 12 and the thinnest leg being a leg score 10.

Premium Certification Criteria

To be classified as North Dakota Premium Lamb, lamb must meet the following criteria. Lamb weight is multiplied by 54 percent to predict carcass weight. Carcasses must be between 50 and 85 pounds to qualify for premium certification. Lambs must be USDA yield grade 2 or 3, which is any lamb with an actual yield grade of 1.5 to 3.4. Lamb loin muscle area must be equal to or greater than the base area for the lamb's weight category. Lamb body wall thickness must be less than or equal to 1.25 inches. Lamb also must have a leg score equal to or greater than 12.

Table 2. North Dakota 4-H Premium Lamb Criteria.

Yield Grade	Carcass Weight (lbs.)	Required Ribeye Muscle Area (sq. in.)	Body Wall Thickness (in.)	Leg Score
1.5-3.5	50-55	≥ 2.8	≤ 1.25	≥ 12 leg score
	55-60	≥ 2.9		
	60-65	≥ 3.0		
	65-70	≥ 3.1		
	70-75	≥ 3.2		
	75-80	≥ 3.3		
	80-85	≥ 3.4		

Index System

If lambs make North Dakota premium lamb certification, the index system will rank lambs based on carcass merit. All premium lambs start with a base index value of 80. For each 0.1 inch increase in yield grade above 1.5, 0.25 point is deducted. For each 0.1 inch2 increase in loin muscle area above the base area for the lamb's weight class, lambs are given 1 point. For each 0.1 inch increase in body wall thickness above 0.8, lambs are deducted 2 points. Conversely, each 0.1 inch decrease in body wall thickness is rewarded with 2 points. Finally, lambs are given 2 additional points for each leg score above 12.

Table 3. North Dakota 4-H Lamb Live Lamb Carcass Index.

Yield Grade	Carcass Weight (lbs.)	Required Loin Muscle Area (sq. in.)	Body Wall Thickness (in.)	Leg Score
1.5	<50	2.7	Base = 0.8	Base = 12 leg score
	50-55	2.8		
	55-60	2.9		
	60-65	3.0		
	65-70	3.1		
	70-75	3.2		
	75-80	3.3		
	80-85	3.4		
	>85 lbs	3.5		
	(+ 0.1 in. = - 2 units)			
(+ 0.1 in. = - 0.25 units)	(+ 0.1 sq. in. = + 1 unit)		(- 0.1 in. = + 2 units)	(+1 leg score = +2 units)

Source:
Lamb Carcass Evaluation, Bernie O'Rourke, Ron Russell, and Dennis Buege
UW-Madison, Department of Animal Sciences
www.dcqmas.org/carcass_contest/Lamb%20Carcass%20Evaluation.pdf

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