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## G83-675 Yield Grades and Quality Grades for Lamb Carcasses

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# Yield Grades and Quality Grades for Lamb Carcasses

This NebGuide discusses yield and quality grades for lamb carcasses and their importance to producers.

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- [Yield Grades](#)
- [Leg Conformation Score](#)
- [Ribeye Area](#)
- [Quality Grades](#)

Lamb carcass grades when applied by a USDA meat grader must consist of a yield grade and a quality grade. Yield grades estimate the percentage of closely trimmed, boneless retail cuts from the leg, loin, rib and shoulder. Quality grades indicate the palatability or eating characteristics of lamb.

Evaluating lamb carcasses for USDA Yield and Quality Grades recognizes carcasses with traits that influence live animal and carcass value, and identifies breeding animals that produce lambs of superior carcass merit.

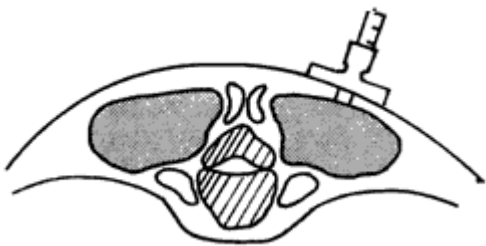
## Yield Grades

Yield grades reflect the "quantity" of retail cuts that can be expected from a lamb carcass. Yield grades are 1, 2, 3, 4 and 5 with yield grade 1 being more desirable than a yield grade 5 in the amount of retail cuts from the leg, loin, rib and shoulder. Adjusted fat thickness of the carcass is the only factor used to determine lamb yield grades. In addition the kidney and pelvic fat must be removed from the carcass, leaving no more than one percent in the carcass.

Yield grades are a numerical representation of % cutability. Cutability is the percentage of carcass weight represented by the boneless and bone-in closely trimmed (0.1 inch) retail cuts from the leg, loin, rib and shoulder. Yield grades and their corresponding % cutability are presented in *Table I*.

<b>Table I. Percentage Cutability and USDA Yield Grade.</b>	
<b>YG</b>	<b>% Cutability</b>
1.0	51.0
1.5	50.35
2.0	49.7
2.5	49.05
3.0	48.4
3.5	47.75
4.0	47.1
4.5	46.45
5.0	45.8
5.9	45.15

**Adjusted Fat Thickness:** Adjusted fat thickness is the most important predictor of cutability and for simplicity in applying the grades is the only yield grade factor. Fat thickness is measured between the 12th and 13th ribs over both ribeyes at the midpoint of the ribeye (*Figure 1*).



**Figure 1. Measuring fat thickness over the ribeye.**

The measurements are then averaged. However, the fat thickness measurement may be adjusted either up or down for unusually heavy or light fat deposits. Fat adjustments of .05 to .10 inch are typical. The amount of fat in the body wall, crotch, cod or udder, sirloin-loin juncture, shoulder and breast is considered in making fat adjustments. The body wall thickness measured from the inside of the rib to the outside fat at 4 inches below the ribeye provides a guideline for adjustments in fat thickness. *Table II* provides typical body wall measurements for each yield grade for a 50 and an 75 pound carcass.

**Yield Grade Calculation:** Yield grades are calculated by using the following formula:

$$\text{YG} = 0.4 + (10 \times \text{adj. fat thickness})$$

For example, to calculate the yield grade for a carcass that has an adjusted fat thickness of .25 inch would be as follows:

**Table II. Typical Body Wall Measurements for different Yield Grades.**

Yield Grade	Typical Body Wall Measurements	
	55 lbs HCW	75 lbs HCW
1	0.75	0.85
2	0.90	1.00
3	1.05	1.15
4	1.20	1.30
5	>1.20	>1.30

$$YG = 0.4 + (10 \times .25)$$

$$YG = 2.9$$

### Leg Conformation Score

Leg conformation score is not used in yield grading but is an indicator of carcass muscling.

Leg scores are normally coded, such as:

15 = Prime +            12 = Choice +            9 = Good +

14 = Average Prime    11 = Average Choice    8 = Average Good

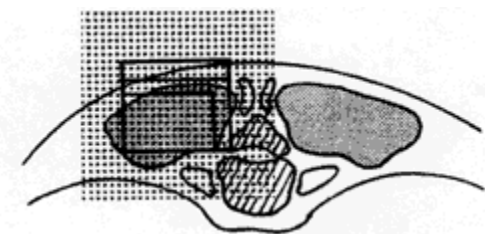
13 = Prime -            10 = Choice -            7 = Good -



**Figure 2. Examples of Average Prime, Average Choice and Average Good leg scores.**

Superior leg scores (higher number codes) are very wide and thick which should indicate a high lean to bone ratio. Narrow, angular legs (lower number codes) will have a lower proportion of edible meat to bone. Examples of three leg scores are shown in *Figure 2*.

### Ribeye Area



**Figure 3. Measuring the ribeye area.**

Although ribeye area is not a yield grade factor, ribeye size is important in evaluating the carcass merit of a lamb. Ribeye area is measured at the 12th rib by using a plastic grid (*Figure 3*) or by tracing the eye on acetate paper and then using a grid or a compensating polar planimeter to determine the area.

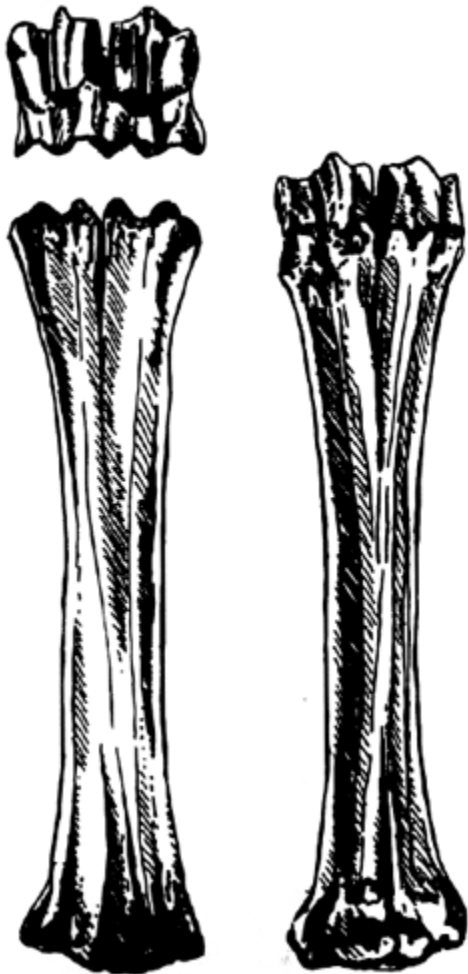
Only the large major ribeye muscle should be measured - do not count the small muscles adjacent to the ribeye muscle. Both ribeye muscles should be measured and the average reported. Requirements for various weight ranges can be calculated using the equation Minimum Ribeye Standard =  $1.4 + (0.02 \times$

Hot Carcass Weight, lbs).

## Quality Grades

Quality grades indicate the expected eating satisfaction of lamb. USDA Lamb Quality Grades are based upon palatability indicating characteristics of the lean and carcass conformation. Conformation has no direct influence upon the eating quality. For quality grading purposes, there are three carcass classes - lamb, yearling mutton and mutton. There are four quality grades within each class. For lamb and yearling mutton the quality grades are Prime, Choice, Good and Utility.

Mutton carcasses are graded Choice, Good, Utility and Cull. The factors used in quality grading lamb carcasses are: 1) maturity, 2) lean quality and 3) carcass conformation.



**Figure 4.** The cannon bone on the left exhibits the typical break joint. In the bone on the right, the cartilaginous juncture has ossified giving the typical spool joint.

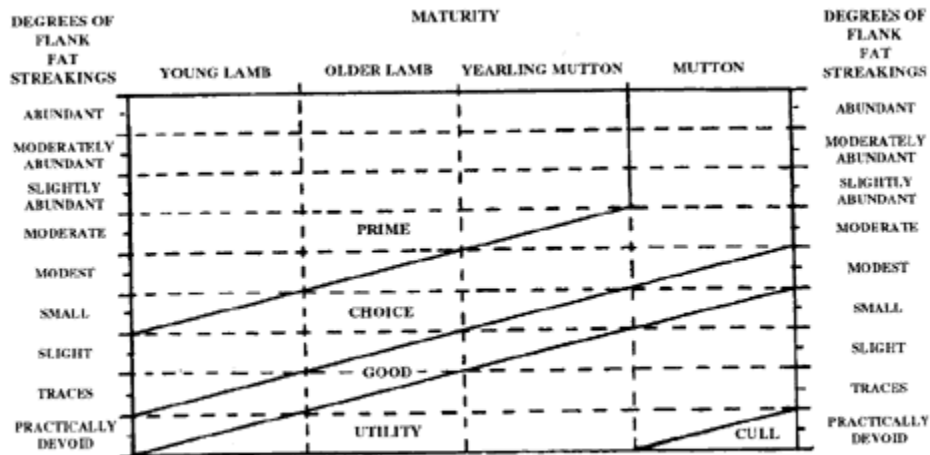
**Maturity:** Maturity in lambs is determined by evaluating lean color and texture, rib bones and break joints. Carcasses are classified as lamb (young lamb or older lamb), yearling mutton and mutton. Lamb maturity carcasses have break joints (*Figure 4*) on both shanks, slightly wide and moderately flat rib bones and a light red, fine textured lean. Yearling mutton carcasses may have either 2 break joints, 1 break joint and 1 spool joint or 2 spool joints, moderately wide rib bones that tend to be flat and a slightly dark red, slightly coarse textured lean. Mutton carcasses always have spool joints on both shanks, tend to have wide, flat rib bones and a dark red, coarse textured lean.

**Lean Quality:** Lean quality is best evaluated by direct observation of texture, firmness and marbling in a cut surface. In lamb grading, direct observation is not possible. Lean quality in lamb carcasses is evaluated indirectly by the quantity of fat streakings within and upon the inside flank muscles. In addition, Prime carcasses must have minimum lean firmness score of "moderately firm" and Choice carcasses must have at least "slightly firm" lean.

**Conformation:** The conformation of a carcass is evaluated by considering all carcass components but giving particular attention to the more desirable cuts. Superior conformation carcasses are very wide and thick in relation to their length and should produce a higher proportion of edible product. Poor conformation lamb carcasses are thinly muscled and have a less desirable lean to bone ratio.

**Balancing Grade Factors:** Lamb skeletal and lean maturity is combined with the amount of flank fat streakings to arrive at a quality grade. *Figure 5* shows the relationship between fat flank streakings, maturity and quality grade. Note that as maturity increases, there is an increasing requirement in the amount of fat flank streakings. For example, to be eligible for the Choice grade the minimum fat flank streaking requirement for lamb (young lamb) maturity carcasses is "Traces". However, for yearling

mutton, the minimum fat flank streaking requirement for the Choice grade is "Small" and for mutton carcasses the minimum requirement is "Modest".



**Figure 5. Relationship between flank fat streaking, maturity and quality.**

The lamb grading standards give minimum carcass conformation scores for each quality grade. However, superior quality can compensate on an equal basis for inferior conformation. A carcass that has average Prime lean quality and average Choice conformation would still qualify for the Prime grade. Also, in the Choice and Good grades, superior conformation can compensate for inferior quality by 1/3 of a grade. For example, a carcass with Good + lean quality can qualify for the Choice grade with average Choice conformation. Regardless of the extent that conformation exceeds minimum requirements, a carcass must have minimum Prime lean quality to qualify for USDA Prime. To be eligible for Choice and Prime grades, carcasses must have at least a thin covering of fat over the back (muscles no more than plainly visible).

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