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Lamb Carcass Quality and Yield Grade Standards

Consumers prefer lamb cuts that combine thick muscling, a minimum of excess fat, and Choice quality grade. The whole sheep industry will profit when producers market more of this kind of lamb. However, producers have little incentive to produce such lambs until our grading system identifies these lambs and their carcasses through the marketing process.

A new system of yield grades was initiated on March 1, 1969, to measure differences in cutability. This system does not change the existing quality grades or their application; but, it adds a means to identify cutability differences for buyers and processors who wish to use it.

Increased use of the new yield grades with the present quality grades should provide producers with the guidance and financial incentives needed to encourage the production of such lambs.

The present grade standards for lamb, yearling mutton, and mutton carcasses became effective in 1960 along with the present slaughter grade standards for lambs, yearlings, and sheep. These standards primarily reflect differences in predicted eating quality and do little to identify differences in cutability (yield of trimmed retail cuts).

Official USDA quality grading service is available to all processors of lamb and mutton carcasses.

Quality Grades

The USDA lamb quality grades are Prime, Choice, Good, Utility, and Cull. The primary factors used to determine the quality grades are maturity, conformation, and a "quality" component.

To be graded lamb, an ovine carcass must have a break joint on each front shank. Typical lamb carcasses have slightly wide, moderately flat rib bones and light red, fine-textured lean meat. By contrast, typical yearling mutton carcasses have moderately wide, flat rib bones and slightly dark red, slightly coarse-textured lean meat. A lamb carcass may be designated young lamb (A maturity) or old lamb (B maturity).

Yearling mutton carcasses may have either break joints or "spool" joints on their front shanks. Typical mutton carcasses have wide, flat rib bones and dark red, coarse-textured lean meat. They always have spool joints on their front shanks.

Conformation is used to describe how the carcass is formed. It includes the development of muscle and bone and is influenced, to some extent, by the quantity and distribution of external fat. Carcass conformation is evaluated by judging the proportion that each cut is of the carcass weight and the general desirability of each cut compared with other cuts.

Best conformation implies a high proportion of edible meat to bone and a high proportion of the carcass weight in the more demanded cuts. Best conformation carcasses are very wide and thick in relation to their length and they have a very plump, full, well-rounded appearance.

Inferior conformation implies a low proportion of edible meat to bone and a low proportion of carcass weight in the more demanded cuts. Carcasses of this type are very narrow in relation to their length and they have a very angular, thin, sunken appearance. External fat in excess of that normally left on retail cuts is not considered in conformation evaluation. Carcass conformation is designated as average Good, top Good, low Choice, etc.

Quality of lean flesh is best evaluated by looking at the texture, firmness, and marbling of a cut surface and relating this observation to the apparent maturity of the live animal. However, when carcasses are graded this observation cannot be made directly because the carcass is not ribbed. Therefore, the quality of the lean must be evaluated indirectly by considering, equally (1) feathering, the quantity of fat intermingled with the lean between the ribs, (2) lacing, the streaking of fat within and upon the inside flank muscles, and (3) firmness of fat and lean in the flank. All these items (feathering, lacing, and flank fullness and firmness) should be related to the apparent evidence of maturity.

Quality grade is determined on the basis of the quality indicating characteristics described in the following table.

Table 1. Minimum requirements for lamb quality grades

Table with 4 columns: Grade, Feathering, Lacing, Flank fullness and firmness. Rows include Prime, Choice, Good, Utility, and Cull.

*For B maturity requirements, add one degree to each quality component.

Each quality indicator (feathering, lacing, and flank fullness and firmness) is emphasized equally when determining the quality grade. To move from the lower 1/3 of a grade (low Good) to the next higher position (average Good), two deviations of degrees from the minimum for any one or all three quality components for that grade are necessary. To move 2/3 of a grade (low Good to high Good) four deviations are necessary.

The final U.S.D.A. Quality Grade is determined by balancing the quality and conformation grades. These balancing factors are used to determine quality grade:

- A. Quality compensates or makes up for inferior conformation on an equal basis. However, the final grade cannot be more than one full grade above or below the conformation grade.
B. Conformation does not compensate for quality except:
1. When conformation is average Choice or better and quality is top Good, final grade is low Choice.
2. When conformation is average Good or better and quality is top Utility, final grade is low Good.
3. When conformation is average Utility or better and quality is top Cull, final grade is low Utility.
4. When the conformation is a full grade or more above the quality grade, the final grade will be 1/3 grade above the quality grade. Conformation cannot move lambs into Prime grade.

Yield Grades

Yield grades are an estimate of the yield of boneless, closely trimmed, major retail cuts from the leg, loin, rack, and shoulder.

Table with 2 columns: Yield grade, Yield of cuts percent. Rows include No. 1, 2, 3, 4, 5.

The yield grade of a lamb carcass is determined by considering three characteristics: fat thickness over the ribeye, percent of kidney and pelvic fat, and the leg conformation score.

The fat thickness is measured over the center of the ribeye muscle perpendicular to the outside surface between the 12th and 13th ribs. On intact carcasses, fat thickness is measured by probing. This measurement may be adjusted, as necessary, to reflect unusual amounts of fat on other parts of the carcass. As the amount of external fat increases, the percentage of retail cuts decreases. Each 0.05-inch change

in adjusted fat thickness over the ribeye changes the yield grade by 1/3 grade.

The amount of kidney and pelvic fat considered in determining the yield grade includes the kidney knob and the lumbar and pelvic fat in the loin and leg. The amount of these fats is evaluated subjectively and expressed as a percentage of the carcass weight. As the amount of kidney and pelvic fat increases, the percentage of retail cuts decreases. A change of one percent of kidney and pelvic fat changes the yield grade by 1/4 grade. The following standard percentages are guides to use in estimating kidney and pelvic fat.

| Grade | Kidney and pelvic fat percent |
|---------|-------------------------------|
| Prime | 4.5 |
| Choice | 3.5 |
| Good | 3.0 |
| Utility | 2.0 |
| Cull | 1.5 |

The equation for determining yield grade of lamb carcasses is $\text{Yield Grade} = 1.66 - (0.05 \times \text{leg conformation grade code}) + (0.25 \times \text{percent kidney and pelvic fat}) + (6.66 \times \text{adjusted fat thickness over the ribeye in inches})$.

The leg conformation score is evaluated in terms of 1/3 grades and coded using 15 for high Prime and 1 for low Cull. An increase in the conformation score increases the percentage of retail cuts. A change of one in leg score changes the yield grade by 5 percent of a grade.

Descriptions of Yield Grades

Yield Grade 1 has only a thin layer of external fat over the back and loin and slight deposits of fat in the flanks and cod or udder. There is usually a very thin layer of fat over the top of the shoulders and the outside of the legs. Muscles are usually plainly visible on most areas of the carcass. A carcass of this yield grade which is near the borderline of yield grade 1 and yield grade 2 might have 0.1 inch of fat over the ribeye, 1.2 percent of its weight in kidney and pelvic fat, and an average Prime leg conformation grade.

Yield Grade 2 has a slightly thin layer of fat over the back and loin and the muscles of the back are not visible. The top of the shoulders and the outside of the legs have a thin covering of fat and the muscles are slightly visible. There are usually small deposits of fat in

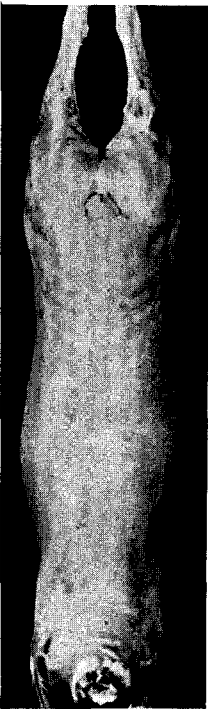


Figure 1. The yield grade 2 carcass weighs 47 pounds. The legs are moderately plump and full with a thin layer of fat over the back and loin.



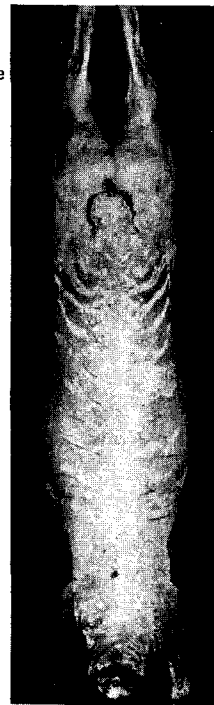
Figure 2. The 12th rib cross section of this yield grade 2 carcass shows a large ribeye with an external fat thickness of 0.15 inches.

the flanks and cod or udder. A carcass of this yield grade which is near the borderline of yield grade 2 and yield grade 3 could have 0.2 inch of fat over the ribeye, 2.5 percent of its weight in kidney and pelvic fat, and a low Prime leg conformation grade.

Yield Grade 3 has a slightly thick covering of fat over the back. The top of the shoulders are completely covered with fat although the muscles are still barely visible. The legs are almost completely covered, although the muscles on the outside of the lower legs are visible. There usually are slightly large deposits of fat in the flanks and cod or udder. A carcass of this yield grade which is near the upper borderline of yield grade 3 could have 0.3 inch of fat over the ribeye, 3.5 percent of its weight in kidney and pelvic fat, and a high Choice leg conformation grade.

Yield Grade 4 is completely covered with fat. There usually is a moderately thick covering of fat over the back and a slightly thick covering over the shoulder and legs. There usually are large deposits of fat in the flanks and cod or udder. A carcass in this yield grade which is near the upper borderline of yield grade 5 could have 0.4 inch of fat over the ribeye, 4.5 percent of its weight in kidney and pelvic fat, and an average Choice leg conformation grade.

Yield Grade 5 usually has more external and kidney and pelvic fat and a lower conformation grade of leg than a carcass in yield grade 4.



Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Roland H. Abraham, Director of Agricultural Extension Service, University of Minnesota, St. Paul, Minnesota 55101.

Figure 3. The yield grade 4 carcass weighs 48 pounds. It has complete fat covering over the back with slightly full muscled legs.



Figure 4. The 12th rib cross section of this yield grade 4 carcass exhibits a medium sized ribeye with 0.35 inch of fat thickness over the ribeye.