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Oklahoma Cooperative Extension Service • Division of Agricultural Sciences and Natural Resources

# Understanding Yield Grades for Beef and Lamb

Not all of the live weight of a beef animal or lamb becomes edible meat, and not all of the meat obtained from a carcass is high-priced steaks or chops. The yield of usable meat from beef and lamb carcasses varies greatly. Yield differences result from differences in the amounts of fat and muscle among carcasses. Yield grade is the term used in the beef and lamb markets to define the amount of usable meat obtained from a carcass.

Many consumers who own home freezers buy sides or quarters of beef or lamb to save money by purchasing large quantities of meat. For these consumers, United States Department of Agriculture (USDA) yield grades offer many advantages. Those who buy only retail cuts need not be concerned with yield grades, since they apply only to carcasses and wholesale cuts.

This publication will answer many of your questions about yield grade, including determination, description, and how to use yield grades.

## What Are the Yield Grades?

The USDA yield grades are rated numerically and are 1, 2, 3, 4, and 5. Yield Grade 1 denotes the highest yielding carcass and Yield Grade 5, the lowest. According to USDA, all quality-graded beef or lamb carcasses must also be yield graded.

## Beef

In beef, the yield grades estimate the amount of boneless, closely trimmed retail cuts from the high value parts of the carcass – the round, loin, rib, and chuck. However, they also show differences in the total yield of retail cuts.

### Beef Yield Grades

Yield Grade	% of Carcass as Boneless, Closely Trimmed Retail Cuts From the Round, Rib, Loin, and Chuck	% of Total Retail Cuts From the Carcass
1	52.4 or greater	79.8 or greater
2	50.1 to 52.3	75.2 to 79.7
3	47.8 to 50.0	70.6 to 75.1
4	45.5 to 47.7	66.0 to 70.5
5	45.4 or less	65.9 or less

## How are Beef Yield Grades Determined?

Meat graders assign a yield grade to a carcass by evaluating (1) the amount of external fat, (2) the amount of kidney, pelvic, and heart fat, (3) the area of the rib eye muscle, and (4) the hot carcass weight.

Graders evaluate the amount of external fat by measuring the thickness of fat over the outside of the rib eye muscle at the 12<sup>th</sup> rib. They adjust this measurement to reflect unusual amounts of fat in other areas of the carcass. Only persons highly skilled in evaluating cutability of beef carcasses can make such adjustments.

The amount of kidney, pelvic, and heart fat is evaluated subjectively and expressed as a percentage of the carcass weight (this usually will be from 2 to 4 percent of carcass weight). The area of the rib eye is determined by measuring the size (in inches, using a dot-grid or planimeter) of the rib eye muscle at the 12<sup>th</sup> rib. Carcass weight is the “hot” (taken on the slaughter-dressing floor shortly after slaughter) or unchilled weight (in pounds). The grader usually writes this weight on a tag or stamps it on the carcass.

The following descriptions of carcasses in the five yield grades will help you understand the differences.

**Yield Grade 1** - The carcass is covered with a thin layer of external fat over the round, loin, and rib; there are slight deposits of fat in the flank, cod or udder, kidney, pelvic, and heart regions. Usually, there is a very thin layer of fat over the outside of the round and over the chuck.

**Yield Grade 2** - The carcass is almost completely covered with external fat, but lean is very visible through the fat over the outside of the round, chuck, and neck. Usually, there is a slightly thin layer of fat over the inside round, loin, and rib, with a slightly thick layer of fat over the rump and sirloin.

**Yield Grade 3** - The carcass is usually completely covered with external fat; lean is plainly visible through the fat only on the lower part of the outside of the round and neck. Usually, there is a slightly thick layer of fat covering the inside round, loin, and rib, plus a moderately thick layer of fat over the rump and sirloin. Also, there are usually slightly larger deposits of fat in the flank, cod or udder, kidney, pelvic, and heart regions.

**Yield Grade 4** - The carcass is usually completely covered with external fat, except what muscle is visible in the shank, outside of the flank and plate regions. Usually, there is a moderately thick layer of external fat over the inside of the round, loin, and rib, along with a thick layer of fat over

the rump and sirloin. There are usually large deposits of fat in the flank, cod or udder, kidney, pelvic, and heart regions.

Yield Grade 5 - Generally, the carcass is covered with a thick layer of fat on all external surfaces. Extensive fat

is found in the brisket, cod or udder, kidney, pelvic, and heart regions.

Figure 1 shows the difference in areas of beef rib eye and thicknesses of external fat between the examples of a Yield Grade 2 carcass and of a Yield Grade 4 carcass.

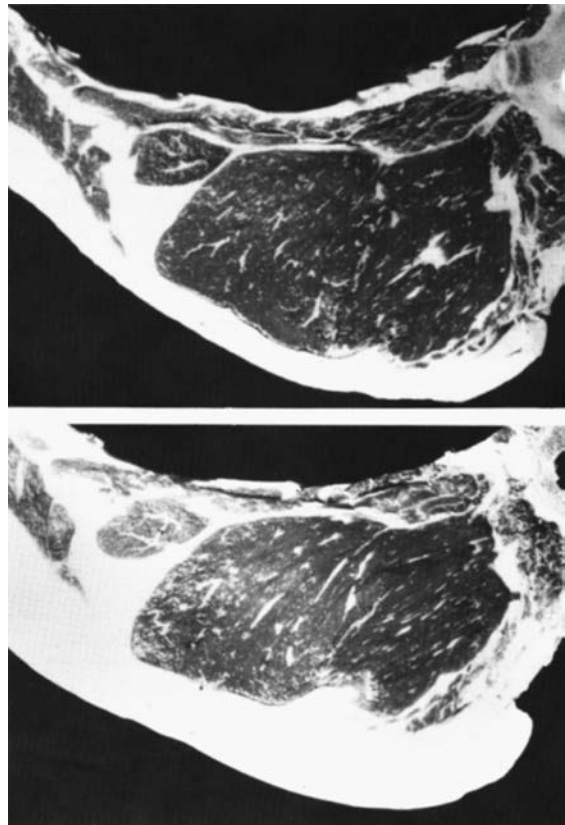
**Figure 1. Beef yield grades.**

**Yield Grade 2 Beef Carcass**

Carcass weight	605 pounds
External fat thickness	.4 inch
Ribeye area	12.3 square inches
Kidney, pelvic, and heart fat	3.0 percent
Yield grade	2.5
Quality grade	Average Choice

**Yield Grade 4 Beef Carcass**

Carcass weight	665 pounds
External fat thickness	.9 inch
Ribeye area	10.5 square inches
Kidney, pelvic, and heart fat	3.5 percent
Yield grade	4.6
Quality grade	Average Choice



**Lamb**

Yield grading of lamb carcasses is very similar to beef yield grading. These grades identify carcasses for differences in expected yield of the trimmed major retail cuts from the leg, loin, rack, and shoulder. There are also five yield grades (1 through 5), with grade 1 representing the highest yield and grade 5 representing the lowest yield.

**How Are Lamb Yield Grades Determined?**

To assign yield grades to lamb carcasses, meat graders evaluate (1) the amount of external fat (measured over the

center of the rib eye muscle at the 12th rib), (2) the amount of kidney and pelvic fat (estimated as a percentage of carcass weight), and (3) the leg conformation score, estimated as high, average, or low in each conformation grade (Prime, Choice, Good, and Utility); this is a measure of muscling.

In Figure 2, look at the differences in areas of rib eye, thickness of fat cover, and amounts of kidney and pelvic fat between examples of a Yield Grade 1 carcass and a Yield Grade 5 carcass.

**How Do You Use a Yield Grade?**

Knowing the yield grade of a carcass can be valuable, especially when you are buying carcasses or sides. You can afford to pay more for a higher yielding carcass; or if there is no price difference between carcasses, you can get more for your money by buying a carcass with a lower numbered (higher yielding) USDA yield grade. The higher yielding carcass will provide more lean meat.

**What To Look For**

You should look for the following characteristics in a high yielding carcass:

**Lamb Yield Grades**

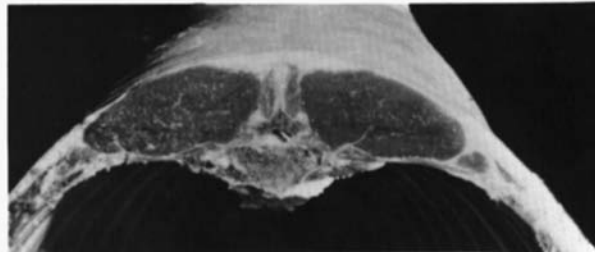
Yield Grade	% of Carcass as Boneless, Closely Trimmed Retail Cuts From the Leg, Loin Rack, and Shoulder	% of Total Retail Cuts From the Carcass
1	47.4 or greater	78.4 or greater
2	45.6 to 47.3	74.4 to 78.3
3	43.8 to 45.5	70.4 to 74.3
4	42.0 to 43.7	66.4 to 70.3
5	41.9 or less	66.3 or less

Figure 2. Lamb yield grades.

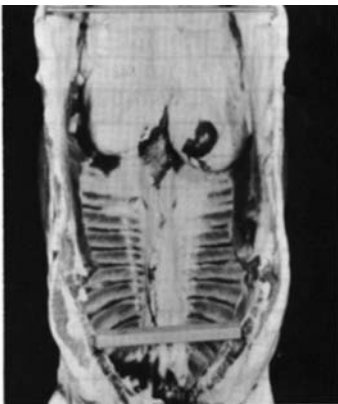
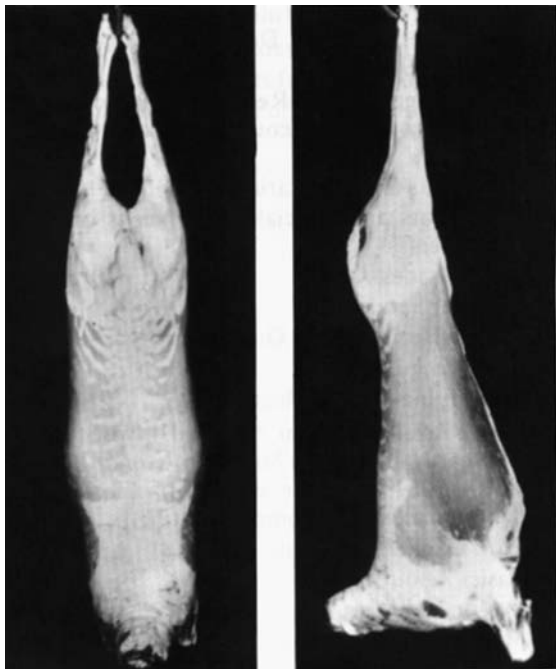
**Yield Grade 1 Lamb Carcass**



<b>External fat thickness</b>	<b>.05 inch</b>
<b>Kidney and pelvic fat</b>	<b>1.5 percent</b>
<b>Leg conformation grade</b>	<b>Low Prime</b>
<b>Yield Grade</b>	<b>1.7</b>



**Yield Grade 5 Lamb Carcass**



<b>External fat thickness</b>	<b>.45 inch</b>
<b>Kidney and pelvic fat</b>	<b>5.5 percent</b>
<b>Leg conformation grade</b>	<b>Average choice</b>
<b>Yield Grade</b>	<b>5.5</b>



**Yield**

- USDA yield grade mark
- Amount of fat in relation to lean
  - Beef: .4 fat is enough; Lamb: .2 fat is enough
- Small amount of kidney and pelvic fat
- Muscle Development
  - Thick muscling in the chuck (shoulder, in lamb), rib (rack, in lamb), loin, and round (leg, in lamb). In beef, the rib eye muscle should be large in relation to the size of the carcass. A 600 pound carcass or 300 pound side should have at least 11.0 square inches of rib eye muscle.

**Study Questions and Activities**

1. Name and describe the different yield grades of a beef carcass and a lamb carcass.
2. Using a 600-pound carcass, calculate the amount (in pounds) of retail cuts that could be expected from each of the five grades.
3. Locate two sources where you could buy a side of beef. Determine the usable meat for each of the two sides and the price per pound of usable meat from each of the two sides.

Example:

### Side 1

yield grade \_\_\_\_\_  
side wt \_\_\_\_\_  
cost/lb (including processing) \_\_\_\_\_  
total cost \_\_\_\_\_  
yield of usable meat \_\_\_\_\_

### Side 2

yield grade \_\_\_\_\_  
side wt \_\_\_\_\_  
cost/lb (including processing) \_\_\_\_\_  
total cost \_\_\_\_\_  
yield of usable meat \_\_\_\_\_

#### Formula:

$$\frac{\text{total cost}}{\text{usable meat}} = \text{cost/lb of usable meat}$$

4. Select two steaks from the supermarket that cost the same per pound but have different amounts of fat and bone. Cook the steaks and weigh the lean meat. Calculate the cost per pound of lean meat.
5. Prepare a demonstration on the use of yield grades for your club.

## Suggested References for 4-H Meat Projects

State 4-H Foods and Nutrition Guides, available from your state Cooperative Extension Service. Obtain them from your county Extension home economist.

National 4-H Foods and Nutrition Project Guides, available from National 4-H Council, 150 North Wacker Drive, Chicago, Illinois 60606

"The Hassle-Free Guide to a Better Diet," U.S. Department of Agriculture, Science and Education Administration, Leaflet Number 567.

Weight Control Materials, state Extension foods and nutrition specialist or your county Extension home economist.

"Diseases Transmitted by Foods," (00-1845), U.S. Department of Health, Education and Welfare, Public Health Bureau, Center for Disease Control, Bureau of Training, Atlanta, GA 30333.

"Food Safety for the Family," Food Safety Series developed by Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Washington, D.C.

Food Safety materials developed by the foods and nutrition specialists your state Cooperative Extension Service. Ask your county Extension home economist to assist you in securing these references.

"What's to Eat? And The Questions Kids Ask About Food," the U.S. Department of Agriculture Yearbook, 1979.

Southern Region 4-H Red Meats Project Guides (available from your county or state Extension Service).

Red Meats and Vegetarianism  
Red Meats and Special Food Needs  
for Family Members  
Yield Grades  
Cost per serving  
Buying Beef in Large Quantities  
Processing Livestock  
Identifying Cuts of Meat

Materials available from National Live Stock and Meat Board, 444 North Michigan Avenue, Chicago, Illinois 60611. (Order catalog of literature and audiovisual aids for a complete listing.)

Pork Cookery Methods  
Basics about Beef  
Lessons on Meat  
Meat Evaluation Handbook  
Teaching about Meat  
Focus on Pork  
Beef Cookery Methods  
Lean Facts about Pork and Calories  
Lean Facts about Pork and Cholesterol  
Exploring the Known — Meat, Diet, and Health  
A Hog's Not All Chops  
How to get the Most for Your Pork Dollar  
A Steer's not all Steak  
Hog is Man's Best Friend  
Be a Smart Meat Shopper  
Pork in the Food Service Industry  
Facts about Beef  
Facts about Ham  
Facts about Pork  
Facts about Lamb  
Identifying Meat Cuts  
Uniform Retail Meat Identity Standards  
Beef and Pork Recipes  
Notebook Charts — Beef, Pork, and Lamb

#### Film Strips

Basic Beef Cookery Teaching Kit  
Beef Buying Basics  
Beef: Your Stake in Basic Nutrition  
The Art of Selecting Cuts of Pork  
A Feast of Facts of Pork Cookery

#### Slide Sets

Meat Identification  
Meat Evaluation Handbook Judging Slides  
Slides available from USDA, Washington D.C.  
USDA Quality Grades for Beef and Lamb  
USDA Yield Grades for Beef and Lamb  
USDA Grades for Pork Carcasses

Materials are also available through your county Extension office and state Extension Service. Write and ask for any information pertaining to 4-H meat projects.

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