

ED 114

Buying a Side of Beef

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Consumers often want to buy a side of beef or a whole beef carcass to reduce meat costs. However, two sides of the same hanging weight can yield much different amounts of cut and wrapped beef. Buying a side of beef can be a "money-saving" or a "money-losing" proposition, depending upon retail yields and purchase cost. Percent retail yield is how much take-home meat is in the side of beef.

Yields should be computed on a percentage basis since hanging weights of carcasses can vary from 400 to 800 pounds, depending upon the size of the animal.

$$\text{Percent retail yield} = \frac{\text{weight of trimmed and packaged cuts}}{\text{weight of the hanging side or carcass}} \times 100$$

$$\text{Example} = \frac{210 \text{ lbs. take home meat}}{300 \text{ lbs. hanging side}} = 70\% \text{ retail yield}$$

Why yields vary

Cutting and trimming procedures influence the percent retail yield. When fat and bone are removed the percent retail yield decreases.

Fat deposits in excess of 3/8 to 1/2 inch are normally trimmed from retail cuts before wrapping. Thus if an animal had very little fat, little or no fat would have to be trimmed. However, some animals contain excessive external and body cavity fats. Animals vary because of their genetic abilities to fatten, together with the amount of feed they have been fed. Also, as the animal and its carcass become heavier, more fat is usually deposited externally, especially between the muscles (seam fat).

The percent bone in a carcass is relatively constant. Animals with dairy breeding will generally yield carcasses containing 1 to 2 percentage units more bone than would beef breeds.

Muscling is important in determining the percent retail yield of a beef carcass. Genetic makeup is one reason animals vary in muscle:bone ratio. As the area of the rib eye increases, the percent retail yield also increases.

How much yields vary

Except for varying cutting and trimming procedures, percent retail yield can be estimated by determining the USDA yield grade of a beef carcass. Yield grade takes into account the fat thickness over the rib eye; the percent kidney, pelvic, and heart fat; the hot carcass weight; and the rib eye area. Figure 1 illustrates two different grades.

Carcass yield grades are determined by USDA meat graders at federally inspected packing plants. However, grading is voluntary; a locker plant may or may not buy yield-graded carcasses from the packer. If a side of beef you want to buy is not yield graded, ask the locker operator to estimate yield grade, or help him. Yield grade is determined by this formula:
Yield grade = 2.5 + (2.50 x adjusted fat thickness, inches) + (0.20 x percent kidney, pelvic, and heart fat) + (0.0038 x hot carcass weight, pounds) - (0.32 x ribeye area, square inches).



Yield grade 2



Yield grade 4

Adjusted fat thickness is measured over the ribeye at a point three-fourths the distance of the ribeye from the chine bone end. Percent kidney, pelvic, and heart fat of the hot carcass weight is subjectively evaluated. Multiply cold carcass (hanging) weight by 1.02 to estimate hot carcass weight. Ribeye area can be estimated with a plastic grid or by tracing the area of the longissimus muscle (between the 12th and 13th rib) on acetate paper and computing the square inches with a polar planimeter.

Yield grades predict the percent retail yield of a carcass or side before that carcass or side is cut and wrapped. Table 1 reveals that carcasses of different yield grades have different percent retail yields.

Yield Grade	% Retail Yield	% Fat and Bone
1	82.0	18.0
2	77.4	22.6
3	72.8	27.2
4	68.2	31.8
5	63.6	36.4

How to compare costs

Yield grade 1 or 2 cattle or beef carcasses will cost more per pound hanging weight than would carcasses of yield grade 4 or 5. Expect a higher percent retail yield from yield grade 1 or 2, but they cost more than do yield grade 4 or 5. So calculate how much more yield you get for the extra price. Each total percent retail yield for each yield grade remains constant (except for variation in cutting and trimming procedures), but price per pound of hanging weight varies from day to day with the wholesale price of beef. Make the following calculation each time you shop for a side of beef, using prices per pound from your favorite retail grocery store.

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To figure total retail value per 100 pounds of hanging weight, multiply the average retail price of the various cuts (including sale-priced items) times each cut's percentage of the

hanging weight for a particular yield grade (table 1). Then add the values. An example retail value calculation for a yield grade 3 carcass is:

EXAMPLE CALCULATION

Retail cut	Yield grade 3		
	Retail price per pound (Get from local store)	Percent of carcass X From Table 1)	Retail value per 100 lbs. hanging weight =
Rump, boneless	\$1.73	X 3.3%	= \$5.70
Top round, boneless	1.82	X 4.1%	= 7.46
Bottom round, boneless	1.76	X 4.4%	= 7.74
Round tip, boneless	1.80	X 2.5%	= 4.50
Sirloin steaks, bone-in	1.71	X 8.3%	= 14.19
Short loin (Club, T-bone, Porterhouse), bone-in	2.01	X 5.1%	= 10.25
Blade chuck, bone-in	.87	X 8.9%	= 7.74
Rib, short cut (7"), bone-in	1.65	X 6.1%	= 10.07
Chuck, arm boneless	1.27	X 5.8%	= 7.37
Brisket, boneless	1.56	X 2.1%	= 3.28
Flank steak	2.13	X .5%	= 1.07
Lean trim	1.12	X 10.3%	= 11.54
Ground beef	.81	X 11.1%	= 8.99
Kidney	.60	X .3%	= .18
Fat	.02	X 17.8%	= .36
Bone	.01	X 9.4%	= .09
Retail value of this side of beef			\$100.53 per 100 lbs. hanging (or \$1.00/lb.)

YOUR CALCULATION

Retail cut	Yield grade		
	Retail price per pound (Get from local store)	Percent of carcass X (From Table 1)	Retail value per 100 lbs. hanging weight =
Rump, boneless	\$ _____	X _____%	= \$ _____
Top round, boneless	_____	X _____%	= _____
Bottom round, boneless	_____	X _____%	= _____
Round tip, boneless	_____	X _____%	= _____
Sirloin steaks, bone-in	_____	X _____%	= _____
Short loin (Club, T-bone, Porterhouse), bone-in	_____	X _____%	= _____
Blade chuck, bone-in	_____	X _____%	= _____
Rib, short cut (7"), bone-in	_____	X _____%	= _____
Chuck, arm boneless	_____	X _____%	= _____
Brisket, boneless	_____	X _____%	= _____
Flank steak	_____	X _____%	= _____
Lean trim	_____	X _____%	= _____
Ground beef	_____	X _____%	= _____
Kidney	_____	X _____%	= _____
Fat	_____	X _____%	= _____
Bone	_____	X _____%	= _____
Retail value of this side of beef			\$ _____ per 100 lbs. hanging (or \$ _____/lb.)

If the price of the side of beef is more than its calculated price for its yield grade, buy the cuts from the retail store as you need them. If the quoted price is less, you would be ahead to buy the side. If you don't get the kidney, fat, and bone, subtract that value from the total retail value. Remember, a carcass can be fatter than yield grade 5, although 5 is as high as the official grades go.

Cutting, wrapping, and freezing costs are usually included in the quoted price per pound. Ask though, to make sure. Frozen locker storage cost is almost always extra.

Quality considerations

Within each yield grade can be variations in quality of the lean as designated by quality grades of Prime, Choice, Good, and Standard. Quality grade is also voluntary and is determined at the same time as is the yield grade. Marbling or specs of fat within the lean primarily determines quality because marbling contributes to flavor and juiciness. Prime has more marbling than does Choice, and Choice has more than does Good.

There are at least 15 combinations of USDA yield and quality grades:

Yield Grade 1—Prime high yielding, usually excellent flavor	Yield Grade 1—Choice	Yield Grade 1—Good high yielding, usually lower flavor
Yield Grade 2—Prime	Yield Grade 2—Choice	Yield Grade 2—Good
Yield Grade 3—Prime	Yield Grade 3—Choice average in yield and flavor	Yield Grade 3—Good
Yield Grade 4—Prime	Yield Grade 4—Choice	Yield Grade 4—Good
Yield Grade 5—Prime low yielding, usually excellent flavor	Yield Grade 5—Choice	Yield Grade 5—Good low yielding, usually lower flavor

Storage

Fresh beef should be stored at 0°F. or lower for no longer than 9 months. Rancidity may develop during longer storage. Rewrap torn packages to prevent air from coming in contact with the meat.

Table 1. Estimated yield of retail cuts as percent of carcass weight for choice beef by yield grades*

Retail cut**	Yield grade 1	Yield grade 2	Yield grade 3	Yield grade 4	Yield grade 5
Rump, boneless	3.7	3.5	3.3	3.1	2.9
Top round, boneless	4.9	4.5	4.1	3.7	3.3
Bottom round, boneless	4.8	4.6	4.4	4.2	4.0
Round tip, boneless	2.7	2.6	2.5	2.4	2.3
Sirloin steaks, bone-in	9.1	8.7	8.3	7.9	7.5
Short loin (Club, T-bone, Porterhouse), bone-in	5.3	5.2	5.1	5.0	4.9
Blade chuck, bone-in	9.9	9.4	8.9	8.4	7.9
Rib, short cut (7"), bone-in	6.3	6.2	6.1	6.0	5.9
Chuck, arm boneless	6.4	6.1	5.8	5.5	5.2
Brisket, boneless	2.5	2.3	2.1	1.9	1.7
Flank steak	.5	.5	.5	.5	.5
Lean trim	12.3	11.3	10.3	9.3	8.3
Ground beef	13.3	12.2	11.1	10.0	8.9
Kidney	.3	.3	.3	.3	.3
TOTAL PERCENT RETAIL CUTS**	82.0	77.4	72.8	68.2	63.6
FAT	7.6	12.7	17.8	22.9	28.0
BONE	10.4	9.9	9.4	8.9	8.4
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%

*Courtesy of E. Curtis Green, USDA, Agricultural Marketing Service, Livestock Division, Standardization Branch, Washington, D.C. 20250.
**Retail cuts are boneless except for the sirloin, short loin, blade chuck, and short cut rib. External fat in excess of 1/2 inch and seam fat in excess of 1/4 inch was removed.