

Buying a Forequarter, Hindquarter, or Side of Beef

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Consumers often want to buy a quarter, a side, or a whole beef carcass to reduce meat costs. However, two sides or two quarters of the same hanging weight can yield very different amounts of cut and wrapped beef. Buying a quarter or 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 or quarter of beef.

Yields should be computed on a **percentage basis** since hanging weights of carcasses can vary from 400 to 800 pounds for a side, or 100 to 200 pounds for a quarter, depending upon the size of the animal.

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

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 $\frac{3}{8}$ to $\frac{1}{2}$ 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 fat. 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 various yield 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 the side or quarter 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 = $2.5 + (2.50 \times \text{adjusted fat thickness, inches}) + (0.20 \times \text{percent kidney, pelvic, and heart fat}) + (0.0038 \times \text{hot carcass weight, pounds}) - (0.32 \times \text{ribeye area, square inches})$. Adjusted fat thickness is measured over the ribeye at a point three-fourths the distance of the ribeye from the chin 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 which may be borrowed from your local Agricultural Stabilization and Conservation (ASC) office.

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

Yield Grade	Side % Retail Yield	Forequarter % Retail Yield	Hindquarter % Retail Yield
1	82.0	84.0	79.9
2	77.4	79.0	74.9
3	72.8	75.6	69.9
4	68.2	71.4	64.9
5	63.6	67.2	59.9

Figure 1. Examples of yield grades 1 through 5 (photos courtesy of John Pierce USDA)

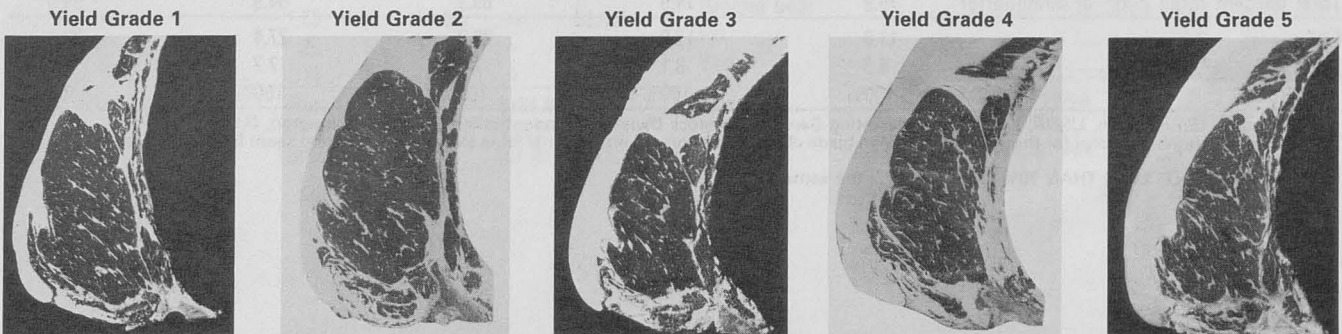


Table 1. Estimated yield of retail cuts as percent of side, forequarters or hindquarter for choice beef by yield grades¹

SIDE—Retail cut²	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 (stew meat or cube steaks)	12.3	11.3	10.3	9.3	8.3
Ground beef-regular ³	13.3	12.2	11.1	10.0	8.9
Kidney	.3	.3	.3	.3	.3
Total percent retail cuts² of side	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%	100.0%	100%
FOREQUARTER—Retail cut²					
Yield grade 1	Yield grade 2	Yield grade 3	Yield grade 4	Yield grade 5	
Blade chuck, bone-in	19.1	18.1	17.1	16.1	15.1
Rib, short cut (7") bone-in	12.1	11.9	11.7	11.5	11.3
Chuck, arm boneless	12.4	11.8	11.2	10.6	10.0
Brisket, boneless	4.8	4.4	4.0	3.6	3.2
Lean Trim (stew and/or cube steak)	17.1	16.1	15.2	14.2	13.2
Ground beef	18.5	17.5	16.4	15.4	14.4
Total percent retail cuts of forequarter	84.0	79.0	75.6	71.4	67.2
FAT	4.6	9.1	13.6	18.1	22.6
BONE	11.4	11.1	10.8	10.5	10.2
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%
HINDQUARTER—Retail cut²					
Yield grade 1	Yield grade 2	Yield grade 3	Yield grade 4	Yield grade 5	
Rump, boneless	7.7	7.3	6.9	6.5	6.1
Top round, boneless	10.2	9.4	8.6	7.8	7.0
Bottom round, boneless	10.0	9.6	9.2	8.8	8.4
Round tip, boneless	5.6	5.4	5.2	5.0	4.8
Sirloin steaks, bone-in	18.9	18.1	17.3	16.5	15.7
Short loin (Club, T-bone, Porterhouse), bone-in	11.0	10.8	10.6	10.4	10.2
Flank steak	1.0	1.0	1.0	1.0	1.0
Lean trim (stew and/or cube steak)	7.2	6.1	5.0	4.0	2.9
Ground beef	7.7	6.6	5.5	4.3	3.2
Kidney	.6	.6	.6	.6	.6
Total percent retail cuts² of hindquarter	79.9	74.9	69.9	64.9	59.9
FAT	11.8	17.0	22.2	27.4	32.6
BONE	8.3	8.1	7.9	7.7	7.5
Totals	100%	100%	100%	100%	100%

¹Courtesy of E. Curtis Green, USDA, Agricultural Marketing Service, Livestock Division, Standardization Branch, Washington, D.C. 20250.²Retail 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.³May be labeled NOT LESS THAN 70% LEAN which is the same as 30% fat.

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 or quarter of beef, using prices per pound from your favorite retail grocery store.

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. Below are examples of retail value calculation for a yield grade 3 side, forequarter, and hindquarter:

EXAMPLE CALCULATION

Side	Yield grade 3			
	Retail price per pound (Get from local store)	×	Percent of side (From Table 1)	= Retail value per 100 lbs. hanging weight
Rump, boneless	1.98	×	3.3%	= 6.53
Top round, boneless	2.29	×	4.1%	= 9.39
Bottom round, boneless	1.98	×	4.4%	= 8.71
Round tip, boneless	2.58	×	2.5%	= 6.45
Sirloin steaks, bone-in	3.29	×	8.3%	= 27.31
Short loin (Club, T-bone, Porterhouse), bone-in	3.94	×	5.1%	= 20.09
Blade chuck, bone-in	1.34	×	8.9%	= 11.93
Rib, short cut (7"), bone-in	3.29	×	6.1%	= 20.07
Chuck, arm boneless	2.29	×	5.8%	= 13.28
Brisket, boneless	2.41	×	2.1%	= 5.06
Flank steak	3.69	×	.5%	= 1.85
Lean trim (stew meat or cube steaks)	1.98	×	10.3%	= 20.39
Groundbeef-regular	1.59	×	11.1%	= 17.65
Kidney	.68	×	.3%	= .20
Fat	.20	×	17.8%	= 3.56
Bone	.13	×	9.4%	= 1.22
Retail value of this side of beef				\$173.69 = 100 lbs. hanging (or \$1.74)

YOUR CALCULATION

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

EXAMPLE CALCULATION

Forequarter	Yield grade 3			
	Retail price per pound (Get from local store)	×	Percent of Foreq. (From Table 1)	= Retail value per 100 lbs. hanging weight
Blade chuck, bone-in	\$1.34	×	17.1%	= \$22.91
Rib, short cut (7"), bone-in	3.29	×	11.7%	= 38.49
Chuck, arm boneless	2.29	×	11.2%	= 25.65
Brisket, boneless	2.41	×	4.0%	= 9.64
Lean trim (stew and/or cube steak)	1.98	×	15.2%	= 30.10
Ground beef	1.59	×	16.4%	= 26.08
Fat	.20	×	13.6%	= 2.72
Bone	.13	×	10.8%	= 1.40
Retail value of this Foreq. of beef				\$156.99 = 100 lbs. hanging (or \$1.57/lb.)

YOUR CALCULATION

Forequarter	Yield grade _____			
	Retail price per pound (Get from local store)	×	Percent of Foreq. (From Table 1)	= Retail value per 100 lbs. hanging weight
Blade chuck, bone-in	\$ _____	×	%	= \$ _____
Rib, short cut (7"), bone-in	_____	×	%	= _____
Chuck, arm boneless	_____	×	%	= _____
Brisket, boneless	_____	×	%	= _____
Lean trim (stew and/or cube steak)	_____	×	%	= _____
Ground beef	_____	×	%	= _____
Fat	_____	×	%	= _____
Bone	_____	×	%	= _____
Retail value of this Foreq. of beef				\$ _____ per 100 lbs. hanging (or \$ _____/lb.)

EXAMPLE CALCULATION

	Retail price per pound (Get from local store)	×	Percent of Hindq. (From Table 1)	=	Retail value per 100 lbs. hanging weight
Hindquarter					
Retail cut					
Rump, boneless	1.98	×	6.9%	=	13.66
Top round, boneless	2.29	×	8.6%	=	19.69
Bottom round, boneless	1.98	×	9.2%	=	18.22
Round tip, boneless	2.58	×	5.2%	=	13.42
Sirloin steaks, bone-in	3.29	×	17.3%	=	56.92
Short loin (Club, T-bone, Porterhouse), bone-in	3.94	×	10.6%	=	41.76
Flank steak	3.69	×	1.0%	=	3.69
Lean trim (stew and/or cube steak)	1.98	×	5.0%	=	9.90
Ground beef	1.59	×	5.5%	=	8.74
Kidney	.68	×	.6%	=	.41
Fat	.20	×	22.2%	=	4.44
Bone	.13	×	7.9%	=	1.03
Retail value of this hindquarter of beef					\$191.88 = 100 lbs. hanging (or 1.92/lb.)

YOUR CALCULATION

	Retail price per pound (Get from local store)	×	Percent of Hindq. (From Table 1)	=	Retail value per 100 lbs. hanging weight
Hindquarter					
Retail cut					
Rump, boneless	\$ _____	×	_____ %	=	\$ _____
Top round, boneless	_____	×	_____ %	=	_____
Bottom round, boneless	_____	×	_____ %	=	_____
Round tip, boneless	_____	×	_____ %	=	_____
Sirloin steaks, bone-in	_____	×	_____ %	=	_____
Short loin (Club, T-bone, Porterhouse) bone-in	_____	×	_____ %	=	_____
Flank steak	_____	×	_____ %	=	_____
Lean trim (stew and/or cube steak)	_____	×	_____ %	=	_____
Ground beef	_____	×	_____ %	=	_____
Kidney	_____	×	_____ %	=	_____
Fat	_____	×	_____ %	=	_____
Bone	_____	×	_____ %	=	_____
Retail value of this hindquarter of beef					\$ _____ per 100 lbs. hanging (or \$ _____/lb.)

If the price of the side or quarter 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 or quarter. 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 speck 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. Carcasses of Commercial grade are from old cows and would normally be expected to lack tenderness.

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 3-Prime	Yield Grade 2-Choice	Yield Grade 2-Good Yield Grade 3-Good
Yield Grade 4-Prime	Yield Grade 3-Choice average in yield and flavor	Yield Grade 4-Good

Yield Grade 5-Prime low yielding, usually excellent flavor	Yield Grade 4-Choice Yield Grade 5-Choice	Yield Grade 5-Good low yielding, usually lower flavor
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The following are advantages of buying a side of beef:

1. Savings of 20-25% on cost of retail cuts compared to buying individual cuts out of a retail case
2. Convenience of having beef cuts in your freezer
3. Less trips to the store
4. You get a variety of cuts
5. Cuts are fast frozen (vs. a slow freeze if you do it yourself) resulting in less drip or juice loss upon thawing

The following are disadvantages of buying a side of beef:

1. Must purchase a freezer
2. Cost of electricity and maintenance of freezer
3. Money used to buy side is not earning interest
4. You may eat steaks quickly and have all roasts left
5. It is more difficult to negotiate a settlement on a "bad" side than a "bad" roast or steak purchased individually
6. Depending upon how well cuts are wrapped and temperature of the freezer, rancidity may develop in those cuts used last

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.