From Steer to Steak
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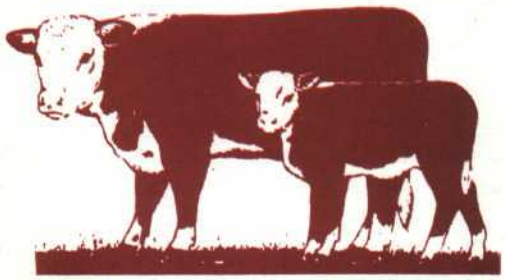

MICHIGAN BEEF PRODUCTION

From Steer to Steak

by Harlan D. Ritchie
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The purpose of this fact sheet is to acquaint you with the retail yield of a beef carcass and the kinds of losses that occur from the live animal to the final product.

Liveweight, Sex, and Body Type Relationships

Nationwide, finished steers average about 1,100 lb.—finished heifers around 900 lb. live weight. Steers normally range from 900 to 1,300 lb. and heifers from 700 to 1,100 lb. Within a breed or type at the same degree of finish, heifers normally weigh 150 to 250 lb. less than steers. Therefore, within a breed or type, heifers will be considerably fatter than steers of the same weight. A common mistake made in feeding out heifers is to feed them too long, consequently getting them overly fat. Of course, when comparing larger-framed, later-maturing heifers of an exotic breed (Charolais, Simmental, etc.) against smaller-framed, earlier-maturing steers of a British breed (Hereford, Angus, etc.) these relationships do not hold. In this instance, they could even be equal in fatness at comparable weights. For more detailed discussion of this subject, refer to Fact Sheet 4200.

We will consider a 1,000 lb. animal with a yield grade of 3 and a quality grade of low Choice. If it were possible to completely separate a Yield grade 3 carcass into fat, bone and lean, it would yield about 24 to 30% fat, 13 to 16% bone, and 54 to 62% lean muscle. However, some bone and fat are left in the retail cuts and for that reason the final retail yield will be somewhat higher than 54 to 62%.

Losses in Shipping and Slaughter

Depending upon how far the animal is shipped to be slaughtered, it may lose from 3 to 4% or 30 to 40 lb. of its body weight in what is called live animal shrink. This loss consists almost entirely of excreta (urine and feces).

When an animal is slaughtered, the head, hide, feet and viscera are removed. These losses amount to about 35% of liveweight or 350 lb. Approximately 70 lb. of this will consist of hide, which is the most valuable by-product from cattle slaughter. Following slaughter, there is an additional loss of about 2%, which consists of moisture evaporation from the carcass.

All of these losses total about 40% of the liveweight or 400 lb. This leaves a 600 lb. chilled carcass hanging in the cooler. The percent of chilled carcass weight that is recovered from the original live animal weight is called *dressing percent*. In this case, the dressing percent is 60%. The normal range is approximately 40 to 66%. Thin cattle have a lower dressing percent; fat cattle have a higher dressing percent.

Mature cows normally dress lower than steers, heifers, or bulls. Unfortunately, the industry often refers to dressing percent as "yield." This is confusing, because "yield" means different things to different people. To a retailer or butcher, "yield" means cutability or the percent of retail cuts from a carcass and has nothing to do with dressing percent.

Table 1 summarizes the losses that normally occur

Table 1. Losses from Live Animal to Chilled Carcass.

Item	*Percent of Liveweight*	*Weight, lb.*	*Value Per Cwt., $*
Initial liveweight	100	1000	$70.00
Live animal shrink	3	30	—
Slaughter losses:			
Hide	7	70	—
Head, feet, viscera, etc.	28	280	—
Carcass moisture loss	2	20	—
TOTAL LOSSES	40	400	—
FINAL CHILLED CARCASS	60	600	$116.67
PLUS TRUCKING AND SLAUGHTER COSTS	—	—	$120.84

from live animal to chilled carcass. As noted in the table, a steer with a live market value of $70.00 per cwt. and a dressing percent of 60% would have a base carcass value of $116.67 ($70 ÷ .60 = $116.67). If you were to have this steer custom killed for freezer beef, you could expect to pay a total of about $25 for trucking and slaughtering. This would add $4.17 per cwt. to the value of the carcass. Therefore, if you were selling this steer for freezer beef, the carcass price would have to be $120.84 per cwt. just to break even. In addition to his slaughter fee, the custom killer normally generates income by selling the slaughter by-products such as the hide, etc. However, his margins are usually quite narrow and his profits per steer are not high even with the income from the by-products.

Carcass Cutting Losses

The breakdown of a typical 600-lb. Yield Grade 3 carcass and its resultant cutting losses are summarized in Table 2. It should be noted, however, that the yield of a given retail cut can vary greatly depending upon how the meat cutter breaks down the carcass into wholesale cuts, how closely the cuts are trimmed of fat, how much bone is left in the retail cuts, etc. Furthermore, there can be a great amount of variation in the number of steaks and roasts, depending upon their thickness. For example, steak thickness may vary from ½ to 2 inches. Every meat cutter or butcher has a slightly different style of reducing a carcass to retail cuts and it is difficult to compare one with another. Nevertheless, Table 2 can serve as a rough estimate of expected retail yields for a Yield Grade 3 carcass.

In this particular example, the final yield of cut and wrapped meat is 72%, which is fairly typical for a Yield Grade 3 carcass. Leaner carcasses would fall into Yield Grades 1 or 2, which have retail yields ranging from approximately 77 to 82%. Fatter carcasses would fall into Yield Grades 4 or 5; their retail yields may range from about 68% for a 4 down to as low as 63% for a 5. In recent years, this overall range in yield (63 to 82%) has resulted in differences in retail value for Yield Grade 5 versus Yield Grade 1 carcasses ranging from $120 to $240 per carcass. Retail value differences between adjacent yield grades may range from $30 to $60 per carcass, or approximately $5 to $10 per cwt. of carcass. The reason for these differences in value is primarily the ratio of lean to fat as one moves from Yield Grade 1 through Yield Grade 5. Percent of bone does not vary greatly from carcass to carcass; therefore its impact on retail yield is not great.

It is interesting to note that the typical Yield Grade 3 carcass is composed of an approximately equal percentage (24%) of steak meat, roast meat, and other meat. The remaining 28% of the carcass is made up of waste fat (18%) and bone (10%). Therefore, this 600-lb. carcass yielded a total of 432 lb. of cut and wrapped meat. Looking at it another way, each 300-lb. side yielded 216 lb. of retail meat. Of this 216 lb., 71.4 lb. was steak meat, 72.6 lb. was roast meat, 72.0 lb. was ground beef and other meat, and 84.0 lb. consisted of waste fat and bone.

A normal cutting and wrapping charge of 15 cents per pound of chilled carcass would add an additional cost of $90 to the final product. The various costs may be summarized as follows:

	Total Cost	**Per Cwt. of Carcass**	**Per Cwt. of Retail Yield**
Value of 1,000-lb. steer at $70/cwt.	$700.00	$116.67	$162.03
Trucking and slaughter charges.	25.00	4.17	5.79
Cutting and wrapping charges	90.00	15.00	20.83
TOTAL	$815.00	$135.84	$188.65

As shown above, a steer sold by a farmer for $70 per cwt. (70 cents per lb.) would have a carcass value of $1.35 per lb. and a retail value of $1.88 per lb. after transportation and processing charges are added to the base value. These figures are used only as examples and would not be applicable to all situations. Nevertheless, they may serve as a guide to those who are either selling or buying sides of beef for home consumption.

There are several other items from a beef carcass that are not accounted for in Table 2. For example, the buyer of a carcass may elect to take the heart, liver and tongue which can vary in total weight from 12 to 20 lb. (liver, 8-12 lb.; heart, 3-5 lb.; tongue, 1-3 lb.). He may also decide to take some soup bones, which could reduce the amount of ground beef if the butcher left a significant amount of meat on the bones.

Table 2. Cutting Losses and Retail Yield of a Typical Yield Grade 3 Beef Carcass.[1]

Retail Cut	Percent of Carcass Wt.	Retail Wt., lb.		Approximate No. of Cuts	
		Per Carcass	Per Side	Per Carcass	Per Side
Forequarter					
Chuck roasts	15.5	93.0	46.5	30	15
Rib roasts	1.8	10.8	5.4	2	1
Rib steaks[2]	3.6	21.6	10.8	24	12
Brisket	1.5	9.0	4.5	2	1
Short ribs	3.5	21.0	10.5	---	---
Stew meat	2.0	12.0	6.0	---	---
Ground beef	11.0	66.0	33.0	---	---
Fat	7.1	42.6	21.3	---	---
Bone	6.0	36.0	18.0	---	---
TOTAL FOREQUARTER	52.0	312.0	156.0	---	---
Hindquarter					
Club steaks[2]	0.7	4.2	2.1	4	2
T-Bone steaks[2]	3.5	21.0	10.5	20	10
Porterhouse steaks[2]	1.0	6.0	3.0	4	2
Sirloin steaks[2]	6.8	40.8	20.4	18	9
Sirloin tip roasts	3.0	18.0	9.0	2	1
Heel of round roasts	1.5	9.0	4.5	2	1
Rump roasts	2.4	14.4	7.2	4	2
Round steaks[2]	7.7	46.2	23.1	18	9
Flank steaks	0.5	3.0	1.5	2	1
Ground beef	6.0	36.0	18.0	---	---
Fat	10.9	65.4	32.7	---	---
Bone	4.0	24.0	12.0	---	---
TOTAL HINDQUARTER	48.0	288.0	144.0	---	---
Summary					
Steaks for broiling	15.6	93.6	46.8	64	32
Steaks for braising	8.2	49.2	24.6	20	10
Total steaks	23.8	142.8	71.4	84	42
Total roasts	24.2	145.2	72.6	42	21
Ground beef	17.0	102.0	51.0	---	---
Other meat	7.0	42.0	21.0	---	---
Total ground beef & other meat	24.0	144.0	72.0	---	---
Retail yield	72.0	432.0	216.0	---	---
Total fat	18.0	108.0	54.0	---	---
Total bone	10.0	60.0	30.0	---	---
Total fat & bone	28.0	168.0	84.0	---	---

[1] *The author gratefully acknowledges Hawk's Quality Meats, Bath, Michigan, for their assistance in compiling these data.*

[2] *Thickness of steaks is ¾-inch.*

For a detailed breakdown of the retail cuts—where they come from and how to cook them—refer to the beef chart on the back page.

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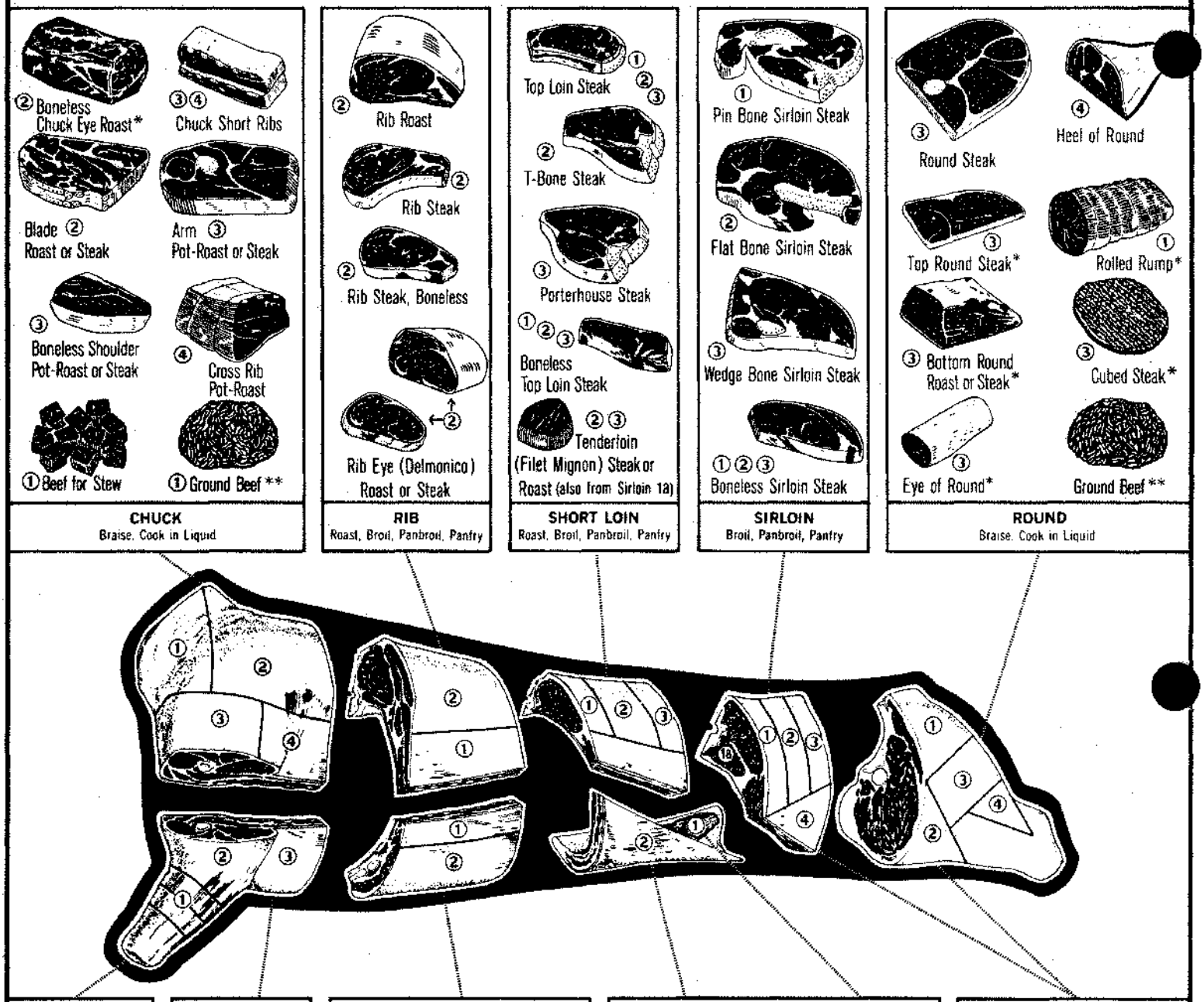
BEEF CHART

RETAIL CUTS OF BEEF — WHERE THEY COME FROM AND HOW TO COOK THEM



*May be Roasted, Broiled, Panbroiled or Panfried from high quality beef.

**May be Roasted, (Baked), Broiled, Panbroiled or Panfried.

This chart approved by

National Live Stock and Meat Board