

Pork Carcass Evaluation

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This handout describes measurements and estimations routinely made on pork carcasses. Information on USDA grading, calculation of percent carcass muscle, lean gain per day (on test or of age) and ranking procedures are also included to assist in understanding and interpreting pork carcass data.

Carcass Measurements and Estimations

Measurement	Description	Average	(Range)
Carcass weight (pounds)	Weight of carcass following slaughter	190	(170 to 220)
Last rib fat thickness (inches)	Measured opposite the last rib. Includes skin and two layers of fat (Fig. 1)	0.8	(.5 to 1.5)
Muscle score	Thickness of ham and other parts of carcass (Fig. 2)	2 (Average)	(1 to 3) (Thin-Thick)
Fat depth (inches)	Measured over exposed loin muscle at 10th rib (Fig. 3)	0.8	(0.4 to 2.0)
Loin muscle area (square inches)	Measured at the 10th rib (Fig. 3)	6.5	(4.0 to 9.0)
Carcass length (inches)	Measured from cranial edge of 1st rib to cranial tip of aitch bone (Fig. 1)	32.0	(28.0 to 35.0)
Lean color (score)	Visual evaluation of loin muscle at 10th rib	2 to 3	(1 to 6) (Pale to Dark)
Lean firmness/wetness (score)	Visual evaluation of loin muscle at 10th rib	2	(1 to 3) (Soft to Firm)
Marbling (score)	Visual evaluation of loin muscle at 10th rib	2 to 3	(1 to 10) (Devoid to Excessive)

Figure 1
 Backfat Measurements
 Carcass Length

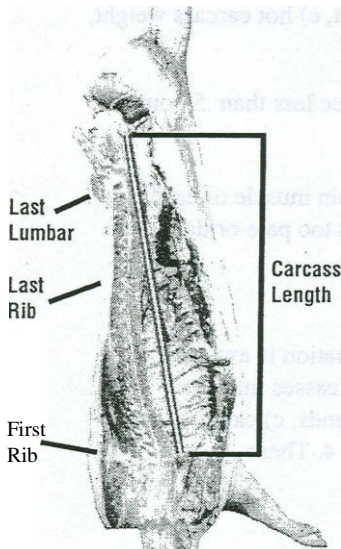


Figure 2
 Muscle Score

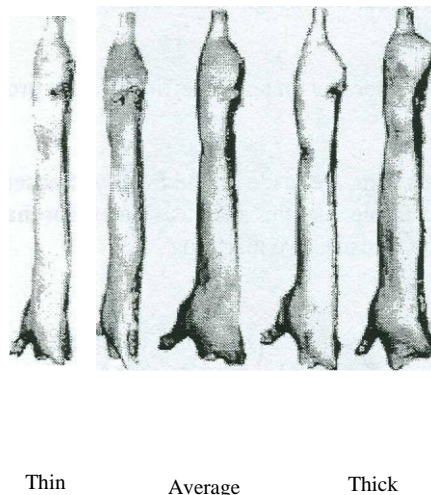
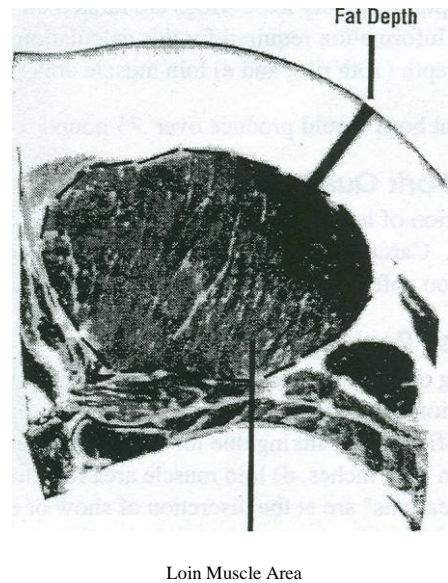


Figure 3
 10th Rib Measurements



USDA Pork Grades:

Pork carcasses and market hogs are assigned grades of U.S. No.1, 2, 3, 4 or utility. Numerical grades predict the expected trimmed yield of the four lean cuts (ham, loin, Boston shoulder, picnic shoulder). The utility grade is assigned to carcasses with unacceptable quality characteristics such as soft and oily fat, pale, soft and watery lean, or too thin bellies.

Grading Exceptions:

1. Carcasses with "thin" muscling cannot grade No.1
2. Carcasses with Last Rib Fat thickness (LRF) greater than 1.75 in. must grade No. 4
3. Carcasses with unacceptable quality must grade Utility

Percent Muscle:

This calculation requires measurement of fat depth and loin muscle area, in addition to carcass weight, and estimates the amount of muscle (trimmed lean) in a carcass.

$$\% \text{ Muscle} = \frac{8.588 + (.465 \times \text{carcass wt}) + (3.005 \times \text{loin muscle area}) - (21.896 \times \text{Fat depth})}{\text{carcass weight}}$$

Superior carcasses generally have more than 55% muscle, average carcasses 50-55%.

Most hogs are marketed on a grid merit system using weight and leanness. USDA grades although important are not as relevant in evaluating hogs as previously in the pork industry.

Lean Pork Gain:

The National Pork Producers Council, in cooperation with meat scientists and the meat industry, developed an evaluation system that combines production information and carcass merit. This system identifies hogs that are efficient producers of acceptable quality lean. Hogs are ranked on "pounds of muscle produced (or lean pork gain) per day on test (or of age)." Information required for this calculation is: a) initial live weight onto test, b) days on test, c) hot carcass weight, d) fat depth (10th rib), and e) loin muscle area (10th rib). Efficient hogs would produce over .80 pounds of muscle per day on test.

Lean Pork Quality:

Evaluation of lean color, firmness and wetness, and marbling are made on the freshly exposed loin muscle of each carcass. Carcasses are discounted for possessing undesirable qualities such as: lean color that is too pale or dark, lean that is too soft and watery, and lean that has insufficient or excessive marbling.

Carcass Ranking Procedures:

Ranking of market hogs using production and carcass traits is encouraged when complete information is available. If production information is not available carcasses are ranked primarily on the basis of Percent Muscle. With the changing pork industry, trends towards carcasses have become more moderate in type. The Wisconsin carcass judges with assistance from Packer survey's and industry trends have come up with minimum requirements for pork carcasses. Minimum carcass weight that is acceptable is 170 pounds. If carcasses are under that, they should not be allowed in the blue ribbon group. Pork carcasses will need to have minimum of .5 inches of fat depth in order to be in the blue ribbon group. Color and firmness need to be acceptable (each need to score a 2 or better) to stay in the blue ribbon group. The pork carcass with the highest % muscle may not necessarily win the carcass show. They have to be able to meet the stated minimums in order to be in the running for the top placing. These "qualifications" are at the discretion of the carcass show judge and show or event management.