

Combining Objective and Visual Scores to Judge Market Hogs

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Two electronic machines are used now to supplement visual judging at market hog shows. One called EMME measures the lean meat in each animal's body and one called Sonoray is used to measure loineye area and backfat thickness.

EMME Measurements

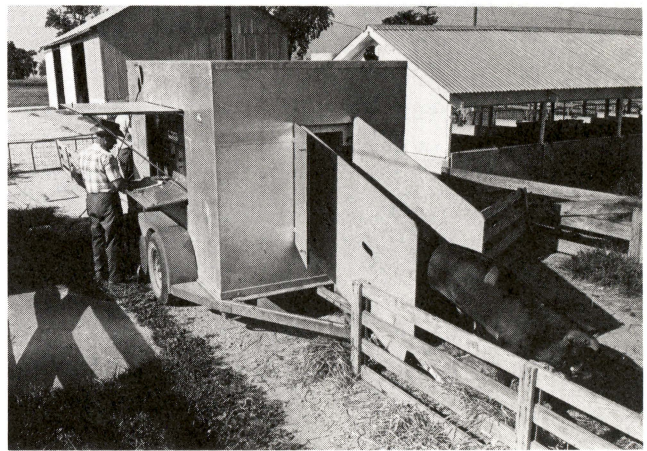
Electronic Meat Measuring Equipment (EMME) is a portable whole-body counter designed to measure muscle in live hogs. The animal walks through a tunnel and is automatically measured for one-fourth second.

The instrument works on the principle that lean tissue conducts electrical energy 20 times better than fat. An electronic winding sets up a magnetic field with very low voltage inside a fiberglass chamber or tunnel. The equipment translates the changes in the field into a number and displays this number on a digital readout unit. The operator finds the EMME reading on a chart, determining the percentage of four lean cuts in the animal. These "four lean cuts" are the hams, the loins, the Boston shoulders, and the Boston picnics.

Research on pork carcasses indicates that the percentage of four lean cuts can be measured within 1.3 percent or about 1.5 pounds of the total lean cuts. Research also indicates EMME is as good for predicting lean as any other instrument or procedure.

The capability of EMME to estimate muscle content in the live pigs was determined by comparing EMME against actual carcass measurements. Carcass measurements included loineye area tracings, average backfat thickness determinations, weight of the four lean cuts, and measurement of carcass chemical composition of fat and lean.

EMME estimates were also compared with potassium isotope (K^{40}) determinations with the University's whole body radioactive counter. It is an instrument that can measure potassium (K^{40}) isotopes, which



Measuring lean meat electronically in market hog class with EMME, the Electronic Meat Measuring Equipment.

occur naturally in lean tissue. This counter has been an accepted method of estimating body composition in live animals and humans for a number of years.

Traditionally, market hogs have been evaluated by weights of hams, loins, and two parts of the shoulder, or by weights of hams and loins. These were expressed as a percent of the chilled carcass weight. The loineye area was used in a ham loin index. Backfat over the loin, loineye area, and hot carcass weight were used to express percent muscle. Regardless of how these factors are combined, they are an indication of the red meat in the carcass.

Backfat thickness, loineye area, and carcass length were used as criteria for minimum qualifications.

EMME evaluation is an attempt to put together these measures or criteria of red meat qualities in each market hog, alive. The following outline for market hog evaluation by EMME and ultrasonics will bring together all the traits that will adequately measure red meat qualities in a live hog.

The carcass traits, combined with a skilled visual live animal evaluation bring together a score or index to rank market hogs. The highly heritable carcass traits may be used to predict performance of sire, dam, and littermates.

EMME Scoring Procedure

For comparative purposes, the percentage of four lean cuts recorded from EMME needs to be adjusted to a standard 230-pound liveweight. To do this, if liveweight is more than 230 pounds, you add one percentage point to the percent of four lean cuts for each 20 pounds above 230. If live weight is less than 230, subtract the same amount.

Example: A hog weighs 250 pounds and the percentage of lean cuts, as shown on the EMME chart, is 59.

$$250 - 230 = 20 \text{ pounds}$$

$$59 + 1 = 60\% \text{ lean cuts}$$

Point scores have been given to various percentages of lean cuts for convenience in scoring animals. These are given in Table 1.

Table 1
Points Given for Various Percentages of Four Lean Cuts (%4LC) When Evaluating Live Market Hogs

%4LC	Point Score	%4LC	Point Score	%4LC	Point Score	%4LC	Point Score
55.8	6	58.2	14	60.0	20	62.1	27
56.1	7	58.5	15	60.3	21	62.4	28
56.4	8	58.8	16	60.6	22	62.7	29
56.7	9	59.1	17	60.9	23	63.0	30
57.0	10	59.4	18	61.2	24	63.3	31
57.3	11	59.7	19	61.5	25	63.6	32
57.6	12			61.8	26	63.9	33
57.9	13					64.2	34

Loin Eye Measurement

Points are also given for loin eye area in figuring total scores for market hogs. This measurement is made with the Sonoray machine.

For each additional one-tenth square inch of loin eye area above 4.7 square inches, one point is added until an area of 5.5 square inches is reached. A decreasing scale of points is added for increases in area beyond 5.5

square inches. See Table 2. Animals must have 4.7 square inches, after adjustment to 230-pound weight, to qualify for certification.

Table 2
Points Added for Square Inches of Loineye Above 4.7

Sq. In.	Point Score	Sq. In.	Point Score	Sq. In.	Point Score
4.7	0	5.20	12	5.8	17
4.8	8	5.30	13	6.0	18
4.9	9	5.40	14	6.2	19
5.0	10	5.50	15	6.4	20
5.1	11	5.65	16	6.7	21

Backfat Thickness

More points are given based on the thinness of backfat of the hog. Backfat is also measured with the Sonoray, in three places. The average is adjusted to a 230-pound standard weight hog, using a standard chart. Scores given for backfat thickness are shown in Table 3.

Table 3
Backfat Thickness Point Scores

Inches	Point Score	Inches	Point Score
1.4	12	.9	17
1.3	13	.8	18
1.2	14	.7	19
1.1	15		

To meet certification, a hog's backfat measurement must be 1.56 inches or less after adjustment to the 230-pound weight.

Judge's Visual Score

The live animal is given a visual type or conformation score of 30 to 50 points by an experienced judge. If more than 20 animals are in a class, a range of 30-60 points is used. No animal is scored below 30 points.

The animals should be screened for length by a committee appointed by the show committee or appropriate person or persons in charge. The minimum length is 29.8 inches.

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