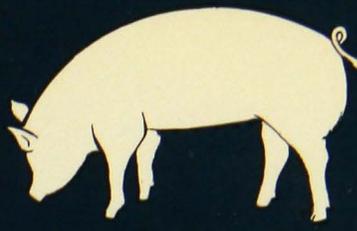


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02

Basement

# Genetic Improvement



through  
Swine  
Evaluation  
Stations

Copy 3



Agricultural Extension Service  
University of Minnesota  
C. J. Christians

Increasing profits through efficient production of high quality pork should be the goal of every progressive hog producer. Improved breeding and feeding practices have greatly improved slaughter hogs, but much pork still does not appeal to the consumer. Greater emphasis must be placed on efficient production of lean pork that meets consumer demand. Minnesota's swine evaluation station helps hog breeders select efficient, fast gaining hogs that produce lean, high quality pork.

### Program Benefits

Both commercial and purebred producers benefit from the Minnesota Swine Improvement Program. The evaluation station helps swine producers locate breeding stock with superior gain, efficiency, and carcass merit. All data are collected under closely supervised environmental conditions. Through seasonal and yearly comparisons, producers can observe swine production trends.

Purebred breeders receive herd sire progeny comparisons of growth rate, feed efficiency, and carcass excellence. This information is automatically forwarded

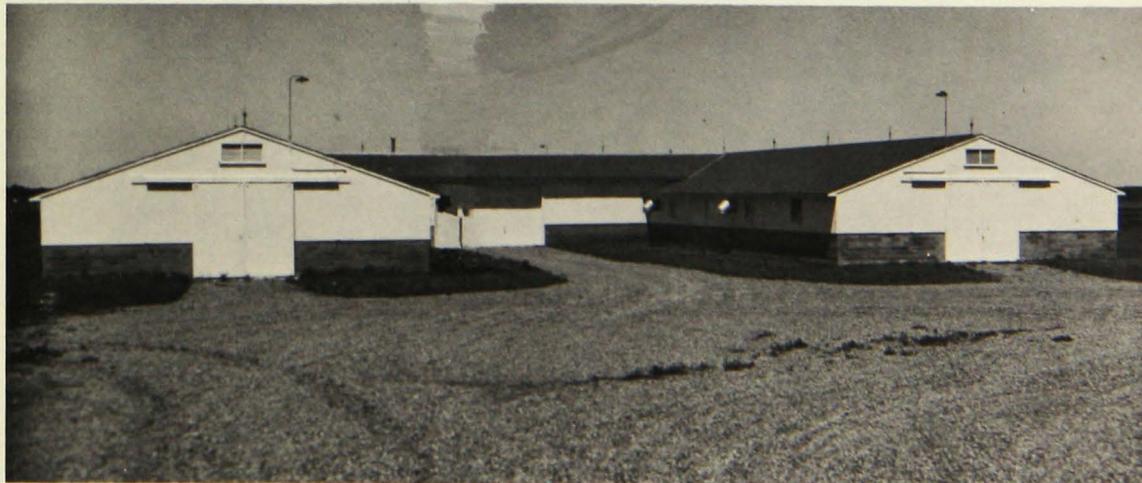
to the respective breed registry associations unless breeders specify otherwise. Such material serves as valuable advertising for the breeder's herd.

### Minnesota's Swine Testing Stations

Until 1969, the Minnesota Pork Producers' Association operated two evaluation stations: the Austin station, opened in the fall of 1957, and the New Ulm station, opened the following spring. These stations had a total capacity of 512 pigs (120 at Austin and 392 at New Ulm).

The Austin station was started in 1957, when George A. Hormel and Company provided a 30-pen hogbarn located on old highway 218 north of Austin. This station was closed in the spring of 1969.

In 1957, the state legislature allocated \$60,000 for establishing swine evaluation stations. The New Ulm station was started when a local group purchased 5 acres of land 2½ miles northwest of New Ulm. The station began operating during the spring of 1958 and, because of its large capacity (98 pens), has become the state swine evaluation headquarters.



The Minnesota Swine Evaluation Station at New Ulm.

This archival publication may not reflect current scientific knowledge or recommendations. Current information available from University of Minnesota Extension: <http://www.extension.umn.edu>.



Figure 1. New Ulm station manager Robert Ginn feeds pigs the standard ration from a 50 pound bag.



Figure 2. Station manager Ginn weighs pigs. Weights of pigs at the test stations are checked periodically.

### General Rules Of The Program

Any purebred breeder or commercial producer who is a member of the Minnesota Pork Producers' Association is eligible to participate in the testing program.

The standard market pen entry is designed for both commercial and purebred producers and consists of four

Minnesota swine evaluation station rations

	Ration 1, 18 percent protein (to 100 pounds)	Ration 2, 15 percent protein (100-200 pounds and over)
No. 2 yellow corn, pounds . . .	1,420	1,590
Soybean meal (44 percent), pounds . . . . .	340	170
Tankage (60 percent), pounds	60	60
Fishmeal, pounds . . . . .	60	60
Dehydrated alfalfa meal (17 percent), pounds . . . . .	50	50
Molasses, pounds . . . . .	40	40
Ground feeding limestone, pounds . . . . .	6	6
Dicalcium phosphate, pounds	15	15
High zinc trace element salt, pounds* . . . . .	10	10
Tylosin, grams . . . . .	100	40
Sulfamethazine, grams . . . .	100	—
Vitamin premix† . . . . .	+	+

\* A regular trace element salt is acceptable. Supplemental zinc is provided at the rate of at least 100 parts per million (90.8 grams per ton).  
 † Vitamin premix: Vitamin additions must supply at least the following amounts per ton: 5 million international units (I.U.) of vitamin A (equivalent to 500 grams of product with potency of 10,000 I.U. per gram); 800,000 I. U. of vitamin D (either D<sub>2</sub> or D<sub>3</sub>); 2 grams of riboflavin; 8 grams of calcium pantothenate (source of pantothenic acid); 10 grams of niacin; and 10 milligrams of vitamin B<sub>12</sub>.

market pigs sired by the same boar with not more than two pigs from the same litter. Two or more market hogs must be barrows. We recommend entering a barrow and a gilt from two litters. Entries must be from litters of eight or more and be free from inherited defects such as scrotal and umbilical hernias, cryptorchidism (one or both testicles retained in abdomen), shakers, inverted nipples, and blindness. Market pigs need not meet breed requirements for registration.

Pig entries must be delivered to the evaluation station before they are 70 days old and must weigh 35-55 pounds. Pigs are placed on test at an average 60-pound weight and fed a standard ration (figure 1). Rate of gain and feed requirements are measured from the time pigs are placed on test until they are removed for slaughter (figure 2). Pigs are slaughtered at an average weight of 220 pounds and the following carcass information is obtained: length of carcass, average backfat thickness (figure 3), loin-eye area at 10th rib (figures 4, 5, and 6), percentage of final test weight that is ham and loin, and carcass quality score (see photos on page 4). The breeder receives a complete performance report on his pigs at the end of the test. This report contains comments about results and suggestions concerning the producer's breeding program.

### Meat Certification

Performance records are submitted to the respective swine registry associations for meat certification when pigs meet all requirements. Breeders must submit meat certification forms properly verified by the association.

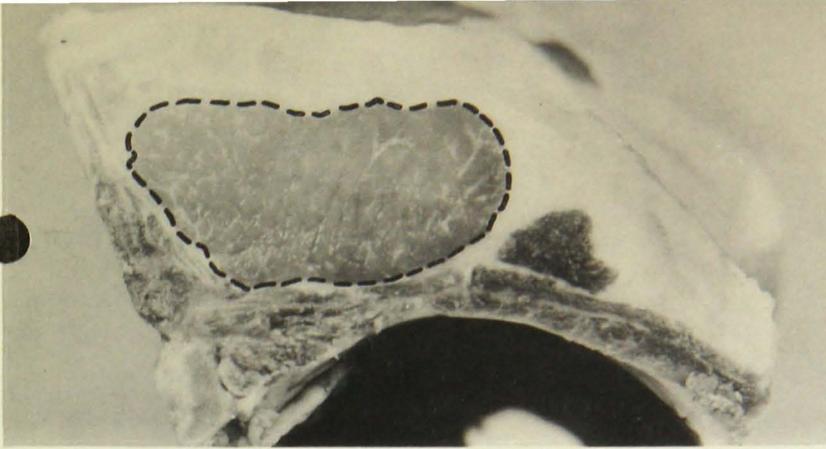


Figure 4 (top). An approximate 2.90 square inch loin-eye area.

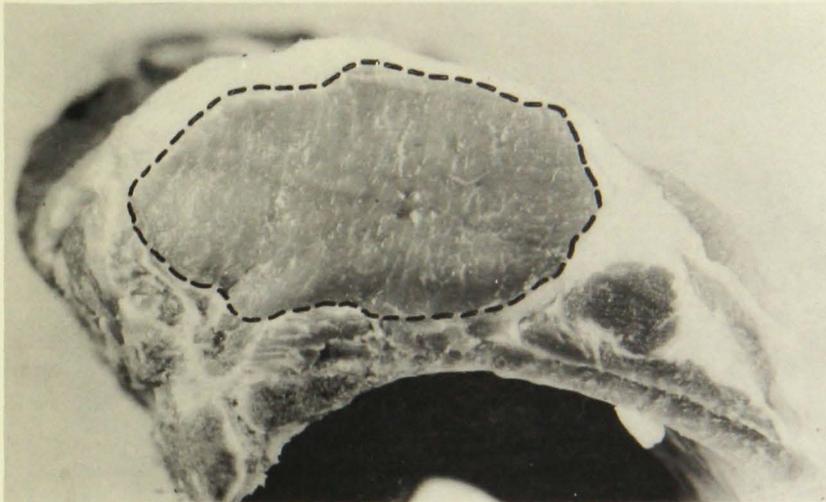


Figure 5 (middle). An approximate 4.90 square inch loin-eye area.

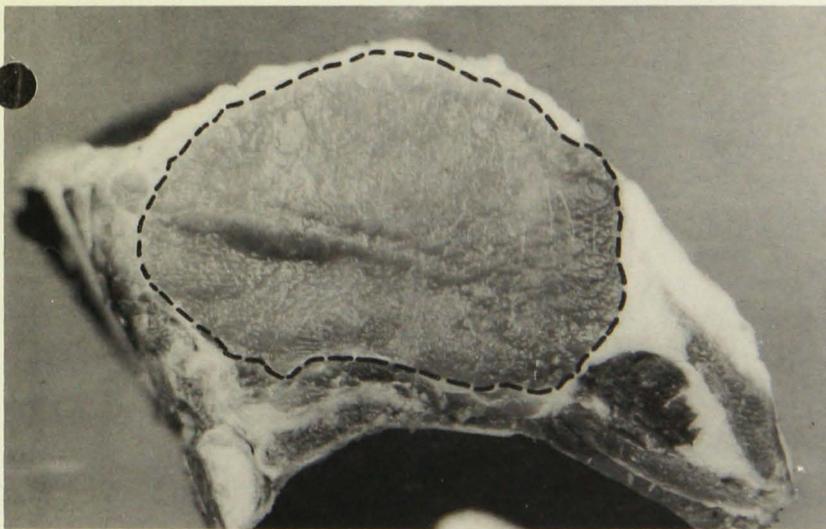
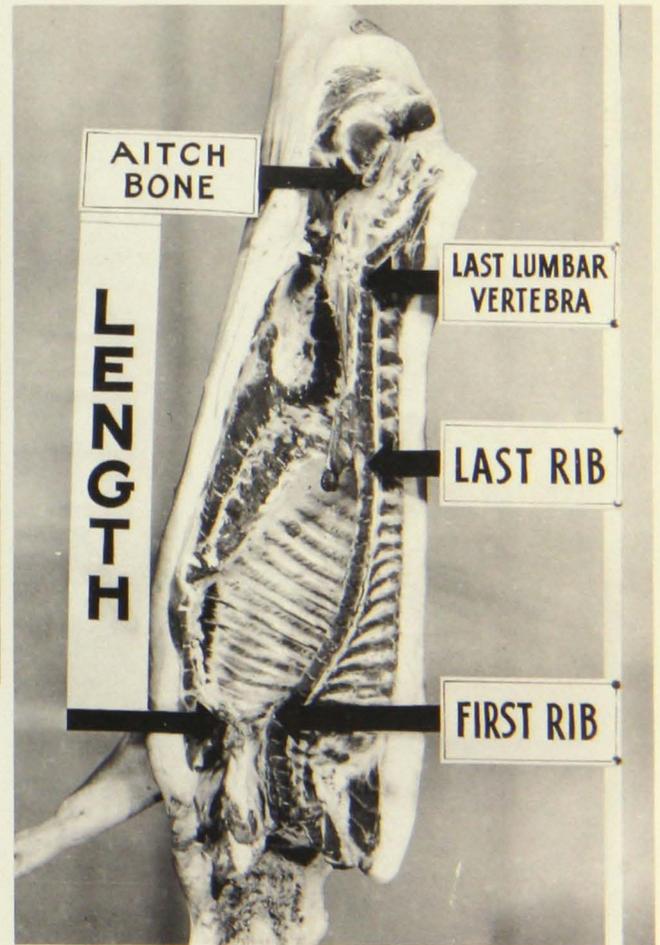


Figure 6 (bottom). An approximate 6.50 square inch loin-eye area. Notice the soft, watery appearance. The actual size of the muscle can be altered by careless handling. Extra care is necessary for accurate measurement.

Figure 3. Carcass length and backfat thickness measurements. Length is measured from the lower point of the aitch bone to the forward edge of the first rib. Backfat is measured opposite the first rib, last rib, and last lumbar vertebra. The average of the three backfat measurements is used.



## Quality Score



Quality Score 1: The ham is two-toned and the gluteus medius (ham) muscle appears pale, soft, and watery. The longissimus dorsi (loin-eye) muscle has the same light color and soft appearance. These cuts are unacceptable.



Quality Score 2: The ham is a more uniform light grayish pink and reveals a moderate amount of firmness and wateriness. These cuts are marginally acceptable.



Quality Score 3: Color, firmness, and shape are ideal. All muscles are grayish pink, firm, and relatively dry.



Quality Score 4: The ham and loin sections are slightly dark and are firm. The muscle is dry and keeps its shape. Consumers prefer this intermediate color.



Quality Score 5: These cross sections appear dark, dry, and firm. The firmness is desirable, but consumers associate darkness with older animals or products that have been on display too long.



Marbling Number 1: Traces of marbling (fat specks within the lean muscle) can be seen in this loin. After cooking, this loin will lack juiciness.



Marbling Number 3: The amount of marbling is modest and acceptable. The meat will be juicy and palatable after cooking.

## Marbling Number



Marbling Number 5: This cut has excessive marbling, which consumers associate with a fat product and so avoid. But such a cut still is more acceptable than a soft, watery loin devoid of marbling.

Market pens must meet the following standards for certification and to qualify a sire for a performance tested boar sale:

- Hogs must weigh at least 220 pounds at 180 days of age.
- Hogs must not have required more than 325 pounds of feed for each 100 pounds of gain.
- The carcass length of market hogs must be at least 29.5 inches.
- Average backfat must not exceed 1.50 inches.
- The loin-eye area must measure 4.50 square inches or more, and the ham must be at least 15 percent of the live weight.

### Health Regulations for Entry

Strict health regulations are followed in the operation of the swine testing station. Each entry must be accompanied by a health certificate signed by a licensed veterinarian certifying treatments (if any) for prevention of erysipelas and freedom from communicable diseases

in the herd. Pigs from diseased herds are not accepted. The station disposes of diseased pigs considered to be health hazards to other entries.

### Performance Tested Boars

On-the-farm tested boars must be either littermates or half brothers to pigs tested at the evaluation station. Boars must reach 200 pounds in 165 days or less and must probe 1.20 inches or less of backfat at 200 pounds. See figure 7 for estimating age at 200 pounds and figure 8 for making backfat probe adjustments. To convert days to 220 pounds, add 2 pounds per day. The conversion factor for backfat thickness is 0.004 inch per pound.

Pigs in the market pen at the station must not have required more than 325 pounds of feed per hundred-weight of gain. The average carcass data obtained on pigs in the pen must meet certification standards. A performance index is computed for each market pen. The index can be helpful to the breeder searching for specific traits in his sire selection.

Figure 7. Chart for measuring age at 200 pounds. Lay a ruler or any straightedge from a point on the left scale, which represents the age of the pig, to a point on the right scale, which represents the pig's weight. The intersection of this line and the center scale shows the estimated age of the pig when his weight is 200 pounds.

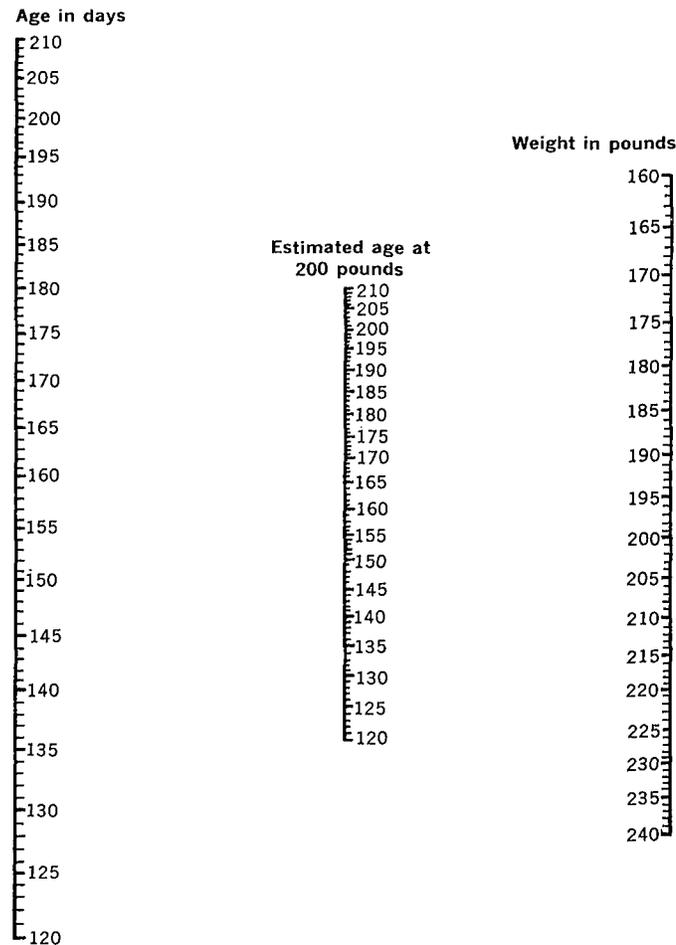
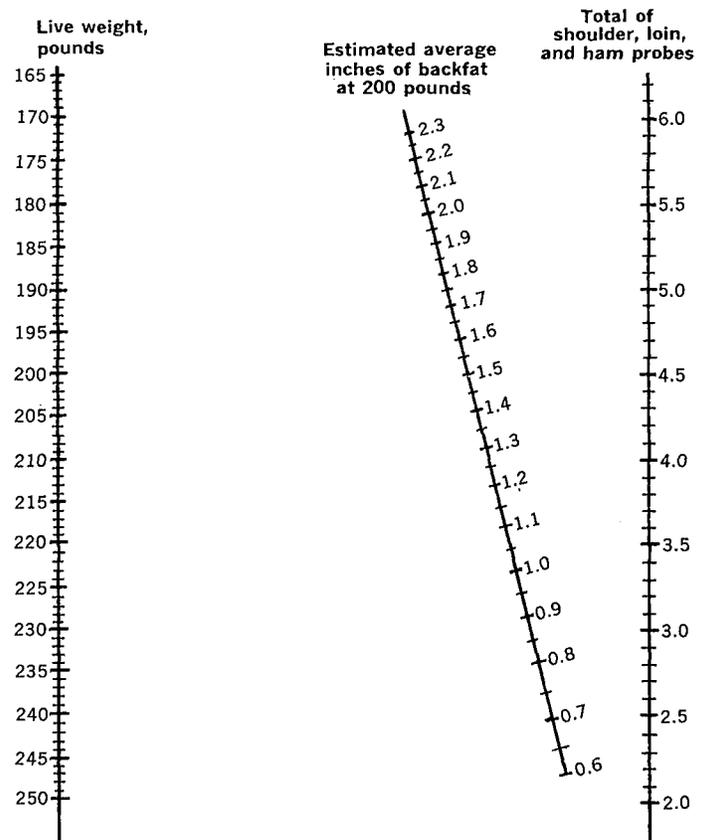


Figure 8. Backfat probe adjustment chart, 200 pounds live weight. Lay a ruler or any straightedge from a point on the left scale, which represents the weight of the pig when probed, to a point on the right scale, which represents the total of the three probes. The intersection of this line and the center scale shows the estimated average backfat thickness at 200 pounds.



**Market pen index chart**

Item	Standard	Points
Average daily gain	1.75 pounds = 25	(+ or -) 1 per .02 pound
Feed efficiency	320 pounds = 25	(+ or -) 1 per 2 pounds
Length	29.5 inches = 15	(+ or -) 1 per 0.1 inch
Backfat thickness	1.40 inches = 20	(+ or -) 1 per 0.05 inch
Loin-eye area	4.50 square inches = 30	(+ or -) 1 per 0.05 square inch
Percentage ham of live weight	15.0 percent = 30	(+ or -) 1 per 0.1 percent

**Example**

Average daily gain	1.95 pounds	25 + 10 = 35
Feed efficiency	295 pounds	25 + 13 = 38
Average length	29.5 inches	15 + 0 = 15
Average backfat thickness	1.25 inches	20 + 3 = 23
Average loin-eye area	5.10 square inches	30 + 12 = 42
Average percentage of ham	16.20	30 + 12 = 42
<b>Market pen index</b>		<b>195 (total points)</b>

**Refunds.** Under certain circumstances, deposits will be refunded to the breeder if the pigs are not delivered. The deposit will be refunded when the breeder submits a statement from his local veterinarian indicating that a disease problem is present in the herd.

A refund will be given if the county agent or vocational agriculture instructor submits a statement indicating that the litter size is below test requirements. If the board of directors decides that the breeder underwent undue personal hardship, the deposit will be refunded. A refund always will be given when an entry cannot be accepted at the station.

**Applications**

Applications for testing market pigs are accepted any time during the year if space is available at the station. To apply, contact your local county agent or the Minnesota Swine Improvement Program, 101 Peters Hall, University of Minnesota, St. Paul, Minnesota 55101.

**Remember**

Evaluation stations alone cannot meet consumer challenges. Only a few individuals from a herd can be evaluated at the station and they may not constitute a representative sample. Therefore, as many pigs as possible must be tested year after year. An effective breeding program involves on-the-farm testing combined with station testing. The key to progress depends on how effectively breeders use their records to select the parental stock for the next generation.

C. J. Christians is professor, Department of Animal Science, and extension animal husbandman.

Photo credits: figure 3, Oscar Mayer and Company, Madison, Wis.; figures 4-6 and New Ulm Swine Testing Station photo (page 1), George A. Hormel and Company, Austin, Minn.

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**Costs To Farmer**

**Entry Fee.** A deposit of \$10 per pen must be included with each application for a market pen entry. After pigs have been delivered to the station, the entry fee is refunded or retained as credit for the next season. Income from the sale of market pigs is used to meet testing costs.

**Application To Enter Pigs**

**MINNESOTA SWINE EVALUATION STATION**

Please complete the following form and send it to: C. J. Christians  
101 Peters Hall  
University of Minnesota  
St. Paul, Minnesota 55101

Breeder's name \_\_\_\_\_ Address \_\_\_\_\_ Zip \_\_\_\_\_

Location of farm \_\_\_\_\_ Phone \_\_\_\_\_

Breed of hogs \_\_\_\_\_ Date test pigs were farrowed or date expected to be farrowed \_\_\_\_\_

Veterinarian's name \_\_\_\_\_ Address \_\_\_\_\_

Number of pigs to be tested this season \_\_\_\_\_