Appropriate measurements are valuable aids in pork carcass evaluation, for they add information which is useful in making the final analysis of a carcass. The objective approach that is possible through the use of measurements contributes to the accuracy of comparisons, not only at the time the carcasses are available but also in the data compiled for further study. The advantages of uniformity and accuracy in making and recording measurements are obvious—without accuracy and uniformity from one time or place to another the measurements are meaningless. It seems that the very purpose of taking measurements, to gain useful information, suggests the use of only those which are pertinent to carcass evaluation. Considerable research over a number of years has been directed toward determining which measurements are most important, and those suggested have been generally found most useful to accurate carcass appraisal. Certain measurements are recommended as the minimum information of this kind required; others are listed as optional steps, recognizing that varying conditions in regard to scope of the work, particular need for and usefulness of the information, as well as availability of facilities for obtaining the measurements often dictate which measurements will be used.

Recommended measurements - linear measurement in metric system and weight to 0.1 pound.

1. Length of carcass - measured from the anterior edge of the aitch bone to the anterior edge of the first rib near the vertebrae. On carcasses unevenly split, the measurement should be taken on the side with the most bone.

2. Thickness of back fat - four measurements, made opposite the last lumbar, the last thoracic, seventh thoracic and the first thoracic vertebrae are used either singly or for average thickness. The purpose of the study will determine if the skin is to be included in fat back measurements. Research study - doubtful if skin should be included.

Optional measurements -

1. Area of eye muscle - obtained from planimeter readings of a tracing of the eye muscle taken immediately posterior to the last rib.

2. Length of hind leg - measured from the anterior edge of the aitch bone to the hoof head.

3. Length of ham - measured from the anterior edge of the aitch bone to the center of the bony projection on the inside of the leg at the hock joint.
4. Circumference of ham - measured midway between the two points used in length of ham measurement. The line to follow around the ham is established by inserting skewers at points on the inside, flank side and tail side of the ham one-half the distance of length of ham from the center of the bony projection of the inside of the leg at the hock joint.

5. Width of carcass - a total of two measurements, one of each side, of the distance from the split surface of the main body of the seventh thoracic vertebra to the outside surface of the carcass. The measurement is made along a line perpendicular to the median plane of the carcass.

6. Depth of carcass - the total depth of carcass, including skin, across the seventh thoracic vertebra.

7. Thickness of belly pocket - measured at the thinnest point in the rear flank region by penetration with a skewer or other suitable device.

8. Thickness of fat on the regular ham - with the ham lying skin side down on a table, measure the thickness of external fat and skin across the cut surface of the butt end of the ham at a point directly beneath the cross section of the hip bone exposed in removing the ham from the side.

Grading is another method of identifying differences between carcasses and an aid to accurate pork carcass evaluation. It is perhaps a less specific method of describing and comparing carcasses than may be accomplished by more complicated procedures. However, grading is a practical method of pointing out differences, and in many cases grades provide sufficiently restrictive categories for the purpose.

The tentative grades for barrow and gilt carcasses proposed by the United States Department of Agriculture are recommended for use in a standard evaluation procedure. Corresponding grades for slaughter barrows and gilts provide a key to the identification of associated live and carcass characteristics. The grades are designed to reflect differences in yields of lean cuts and of fat cuts and in quality of meat. The Choice grade includes carcasses with sufficient finish to produce cuts normally acceptable as Choice quality, and Choice No. 1, Choice No. 2, and Choice No. 3 grade carcasses all have similar quality characteristics. However, yield of lean cuts decreases and yield of fat cuts increases in proportion to increasing finish from Choice No. 1 to Choice Nos. 2 and 3. Medium grade carcasses are somewhat underfinished with a resulting lower quality of cuts than Choice carcasses. The Cull grade represents decided underfinish with cuts of very low quality normally suitable only for use as processing pork.

Measurements of average back fat thickness in relation to either weight or length of carcass are used as objective bases for the grades and to serve as guides to aid in the uniform and accurate interpretation of the standards. Application of the standards in grading carcasses involves consideration of either visual or actual measurements as well as other characteristics described in the standards.
Use of carcass grades in evaluation will serve the purpose of identifying some of the major differences common among pork carcasses. At the same time, live grading may be used to link the carcass characteristics to differences in the live hogs. Further refinement of the analysis may be accomplished through the use of measurements, cutting, and other more detailed procedures.

SLAUGHTER RECORD

Most of the Experiment Stations doing carcass research work with swine were contacted, and we received about as many different forms as stations reporting. There seems to be no one data collection sheet that is best for all occasions. The nature of the investigations will determine the kind and amount of information needed. However, the following items should be considered in planning a slaughter sheet:

Date and time of slaughter
Breed, sex, and age
Time taken off feed
Weight at end of feeding trial
Kill or live weight at slaughter
Total viscera weight
G. I. tract weight
Edible organs and glands: Liver, heart, tongue, kidney
Ruffle fat
Head weight (if removed)
Hot carcass weight
Cold carcass weight
Dressing percentage
Color of lean
Firmness of fat
Measurements:
  Length of carcass
  Backfat thickness
  Area of eye muscle
  Others
Miscellaneous
Comments

A few data forms are included.
<table>
<thead>
<tr>
<th>NAME</th>
<th>ADDRESS</th>
<th>DATE</th>
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</thead>
<tbody>
<tr>
<td>TATTOO NO.</td>
<td>EAR TAG NO.</td>
<td>BREED OR X</td>
</tr>
<tr>
<td>LIVE WEIGHT</td>
<td>STO. INTEST WT.</td>
<td>ADJ. FOR FILL</td>
</tr>
<tr>
<td>ADJ. LIVE WT.</td>
<td>CHILLED CARCASS WT.</td>
<td>YIELD</td>
</tr>
<tr>
<td>LENGTH OF SIDE</td>
<td>FAT THICKNESS: 1. 2. 3. Av.</td>
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</tr>
<tr>
<td>DISTANCE HAULED</td>
<td>AGE</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WEIGHT</th>
<th>PRICE</th>
<th>AMOUNT</th>
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<tbody>
<tr>
<td>LBS. OZS.</td>
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</tbody>
</table>

- Skd. Ham
- Regular Picnic
- Boston Butt
- Regular Loin
- Regular Trimmings
- Sq. Cut Seedless Belly
- D S Jowls
- Fat Trim. (Fatback Included)
- Sp. Ribs
- Neck Bones
- Fore Feet
- Hind Feet
- Tail
- Cutting Shrink

| TOTAL | | |

126.
HOG CARCASS DATA

Oklahoma Agricultural Experiment Station
Animal Husbandry Dept.

DATES: Slaughtered __________________ Water weighed ___________ Cut ___________

PIG NO. __________ TATTOO ___________ SEX ___________

Wt. on feed ___________________ LINE ___________

Shr. live wt. ________________

Hot carc. wt. ________________ Killing fat ___________

CARCASS MEASUREMENTS

<table>
<thead>
<tr>
<th>L. Side</th>
<th>R. Side</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Backfat, 1st. rib</td>
<td>Backfat, 7th rib</td>
<td>Backfat, last rib</td>
</tr>
<tr>
<td>Backfat, 6 lum.</td>
<td>Length</td>
<td>Length hind leg</td>
</tr>
<tr>
<td>Width loin eye</td>
<td>Depth loin eye</td>
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</tbody>
</table>

SUMMARY

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<thead>
<tr>
<th>Carcass length</th>
<th>Av. Backfat</th>
<th>Loin lean area</th>
<th>Spec. Grav.</th>
<th>% Lean cuts (3)</th>
<th>% Primal cuts</th>
<th>Carcass score</th>
<th>Carcass index</th>
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WEIGHTS

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<th>L. Side</th>
<th>R. Side</th>
<th>Both Sides</th>
<th>% Shr.</th>
<th>% Carc.</th>
<th>Rel. value</th>
<th>Score</th>
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<tr>
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<tr>
<td>Carc. wt. in water</td>
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</tr>
<tr>
<td>Sk. ham</td>
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</tr>
<tr>
<td>Tr. loin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sk. shoulder</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Tr. belly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fat trim &amp; skin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leaf fat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lean trim</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
## PORK SLAUGHTER AND CARCASS YIELD RECORD

Animal Husbandry Meats Laboratory
University of Tennessee

Date ________________

### Slaughter Identification ________________________ Market Class ________________________

<table>
<thead>
<tr>
<th>Grade</th>
<th>Purchase wt.</th>
<th>Price</th>
<th>Total Cost</th>
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</thead>
<tbody>
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</tbody>
</table>

### Weight of Side

<table>
<thead>
<tr>
<th>Weight of Side</th>
<th>Left</th>
<th>Right</th>
<th>Weight</th>
<th>% of Kill wt.</th>
<th>Price</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Trimmed Ham</td>
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<tr>
<td>Regular Ham</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh Side (Belly)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boston Butt</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Picnic Shoulder</td>
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<tr>
<td>Full Shoulder</td>
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</tr>
<tr>
<td>Trimmed Jowl</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Spare Ribs</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Lean Trim</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fat Back</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Fat Trim</td>
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</tr>
<tr>
<td>Clear Plate</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Feet, Tail, Kidney</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neckbones</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Rendered Lard</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### MEASUREMENTS

- Back Fat
- 1st Rib
- Last Rib
- Last Lumbar
- Length
- Depth
- Width
- Firmness
- Color

Inspector's Report: ____________________________________________________________

A.H. 359 ________________________________________________________________

______________________________________________________
Signature
Firmness

It appears that the penetrometer is the instrument of choice in measuring firmness. It offers a method for the routine analysis of fat samples which does not involve chemical analysis, which are as a rule time consuming. Values obtained with this instrument have been found to be highly correlated with the degree of firmness (as determined manually), refractive index, iodine number, and melting point. Hiner & Hankins have proposed the following standards for the use of the penetrometer: Hard 0-21, Medium Hard 23-33, Medium Soft 34-38, Soft 49-70, and Oily 71 and over. These values were established for the penetrometer under a standard load (including the needle, test rod, and added load) of 255.65 gms., using a needle three inches long with a working end 0.15 inches in diameter and allowing the needle to penetrate the sample for 15 seconds. The samples were cut to fit inside a sample box 3 by 3 by 1 inches. All carcasses were chilled for approximately 72 hours at 33° to 35° F., and the tests carried out in a room at the same temperature. Further details can be found in: Journal of Agricultural Research, Vol. 63, No. 4, pp. 233-240, August 15, 1941.

Color

Although many color measuring instruments have been adapted for use on meats, few of them have proven to be entirely satisfactory due to the nature of the sample. It is evident that where the human factor is involved between station variation will be great and within station variation cannot be entirely eliminated. It is believed that the Spectrophotometer, the Color Comparator, the Munsell discs, and the Munsell color paddles reduce this error considerably. The use of the Hunter Color Difference Meter offers a more objective method of measuring color, in which the human error is greatly minimized. This Color Difference Meter can be applied to the routine color analysis of meat samples and would give results which would be comparable between stations. This meter has one disadvantage, in its price, and hence it has not been widely used. If this instrument were available to more stations, it appears to be the method to choose as standard. Information on this instrument may be obtained by writing H. A. Gardner Laboratory, Inc., 4723 Elm Street, Bethesda 14, Maryland.

SOME NEW TECHNIQUES

Carcass Specific Gravity Procedure

The procedure for determining hog carcass density or specific gravity is a simple one. The chilled half carcass is weighed to the nearest .1 pound on a pair of Toledo springless scales to obtain the chilled air weight. A cylindrical galvanized tank, seven feet tall and 30 inches in diameter, is filled with water and raised on the elevator from the basement so that the open top of the tank is raised about a foot above the level of the slaughter floor. A table is placed across the elevator shaft and a Toledo balance scale placed on it. The scale is located near enough to the edge of the table to allow a string on which a hook is suspended to swing free of the table edge. The string is tied to an arm of the scale weighing platform and the scale balanced with the hook immersed in the water. The half carcass is completely immersed in the water suspended from the hook and the water weight recorded to the nearest .01 pound.
The specific gravity or carcass density is calculated by dividing the air weight of the carcass by the air weight minus the water weight. The quotient is carried to the third decimal place. Specific gravity values have varied from 1.008 for very fat carcasses to 1.062 for very lean carcasses.

**PRICE INDEX FOR PORK PRIMAL CUTS**

Percent yield of trimmed ham on shrunk live weight $\times 1.02$  
" " " loin " " " $\times 1.00$  
" " " shoulder " " " $\times 0.74$  
Carcass value (Sum.)

The trimming of the cuts eliminates any tendency of getting an index value too high because of overfinished or excessively fat hogs. If any system of grading is used prior to slaughter or after slaughter we should eliminate any tendency of a high index value because of the production of hogs that are too lean or underfinished. The numbers (1.02, 1.00 and 0.74) are the relative prices of these cuts with the price of the loin equal to 1.00. The prices were determined from the "National Provisioner" for the period 1946-1950 using weekly Chicago wholesale prices.

This index may not be the final answer but it has compared very favorably with more complicated indexes in use at this and other stations.

Attention is called to the following:

Mechanical measurement of fatness and carcass value of live hogs. L. N. Hazel and E. A. Kline.


# PRICE SUMMARY

## 1946-1950

### Chicago

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<tr>
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<td>$1353.5</td>
<td>$1731.2</td>
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### New York (City)

#### Regular hams

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N - Number of price quotations in each year for individual cuts
X - Average price for each cut for each year.
132.

FUTURE NEEDS IN PORK CARCASS EVALUATION

Histology of Pork

Very little work has been done on the histology of fresh pork. Reported work has been confined mainly to changes occurring during freezing and storage. This is not true of beef which may vary greatly in tenderness. It would appear that measurement and determination of cause of tenderness has been one of the primary reasons for the extensive histological research as related to beef.

Suggestions for histological pork studies are:

1. Effect of rigor mortis on curing -- rapidity, flavor, tenderness and yield.

2. Effect of rapid gains compared with slower gains on the muscle fibers.

3. Preliminary investigations to determine if individual differences are due to breeding or feeding.

SCORING OF PRIMAL CUTS

A standard scoring method for primal cut would be a useful tool in pork carcass evaluation. A method using scores from 1 to 9 with the larger numbers representing the most desirable has been suggested. However, no standard method for gaging quality has been argued upon. Photographic standards offer great promise.

MR. COLE: We have prepared a report and I think most of you have a copy. It was passed out yesterday with the idea and the hope that you might have time to look it over. There are, of course, things in here that we are not proposing for adoption. They are just more or less added and we will take them up as we come to them.

I should like to preface this report by saying that we have not attempted to go into great detail, maybe due to the fact that the product we are working with, pork, has a few more angles, a few more possibilities, a few more retail and wholesale cuts than the others, and so possibly we cannot have complete standards on everything. We have not, for instance, attempted to tell you at what temperature to scald the hogs nor whether or not you should hand scrape them or dehair them, etc., with a dehairing machine. But we have, we think, included more or less the important points that possibly are not standardized the country over.

We are going to start this off with the slaughtering and chilling procedures, and we are going to ask Mr. Hiner to be the main stem on this.

He is going to be answering your questions. We would like to handle this more or less as a panel. I am going to sit down because that is the way most panels operate.
We will assume that you have had a chance to look this over, and this is a simple, one-page statement on slaughtering and chilling procedures. I think the greatest point at issue here is on the method of slaughtering. The matter of taking off feed and shrink has been pretty well taken care of. Taking the head off or leaving it on is something that maybe does merit some discussion.

What do you think about that, Mr. Hiner? Do you think that will work at the Beltsville Station?

MR. HINER: I have seen it tried and I think as far as I know it has been quite successful. That is in the packing plant. There is quite a little knack in dropping the head so that you get your jowls left, I believe.

MR. COLE: Of course, with this combination method it could be recorded as shipper style or it would really be a modified shipper style and packer style, and, of course, the yields and primal cuts could be figured on either or both.

Would you have any comments to offer on this slaughtering and chilling procedure before we put it up for approval?

MR. HINER: No, not at the present time.

MR. COLE: How about from the group? Do you have any suggestions for changes?

MR. MACKINTOSH: In chilling you say to chill 24 hours from 34 to 36 degrees Fahrenheit. Would it not be better to specify a certain internal temperature of the ham?

MR. COLE: I think that is a good suggestion. What internal temperature should we put down as a standard?

MR. MACKINTOSH: The internal temperature of ham should be brought down under 40 in 24 hours.

MR. FRANCIONI: What about a compromise of 38?

MR. MACKINTOSH: I don't know what it should be. We like to get them down there.

MR. COLE: So we would incorporate under No. 4, chilling, that the internal temperature of the ham should reach under 40 degrees in 24 hours. Is that what you want?

All right, any other changes that you think might be essential?

MR. LOEFFEL: Suppose you don't get them down to that temperature. Do you wait 12 more hours or what.

MR. MACKINTOSH: Just wait until you get it.

MEMBER: Will you please specify what you mean by complete chilling?
MR. COLE: I think we can say, "Cut when thoroughly chilled 48 hours or as soon as possible after complete chilling as described above." Will that be sufficient?

MR. E. A. PIERCE: I move that the cuts be made at the end of 24 hours providing the internal temperature of the ham is down below the recommended standard. I think it was 40 degrees or 38 degrees.

MR. BUTLER: I second the motion.

MR. COLE: Any discussion? All those in favor of Mr. Pierce's motion let it be known by saying "aye"; those opposed by a like sign. Well, apparently it is passed by a very small number.

Now on this next portion of the program -- by the way, I presume we need a motion on the whole thing to pass on that slaughter procedure.

MR. WANDERSTOCK: I so move.

MR. COLE: Mr. Wanderstock moves that the slaughtering and chilling procedures be approved, that that portion of the report be approved.

MR. ADAMS: Second.

MR. COLE: All those in favor let it be known by saying "aye"; opposed. (Carried)

In the cutting procedures we have practically the same thing as we had last year where it was attempted to demonstrate cutting. Apparently, there was no big disagreement in the statement we presented and it is exactly the same as last year.

Are there any questions concerning the cutting procedures?

MR. HENRICKSON: I wonder if it would be wise to put a definite measurement, from the vertebra process at the point of the last rib to where that line will come down.

MR. MACKINTOSH: That is the suggestion I was going to make. It is not a measurement, but I have found it very helpful and pretty nearly standard. When you lay the carcass on the block when cutting that loin, hold that side so that the flat side of the shoulder blade is parallel with the table. The shoulder blade varies very little. It is in there deep enough so that no matter how the carcass is crowded, it is not influenced one way or another and you have something that is standard on the skeleton.

MR. COLE: In other words, the lower edge of the shoulder blade, the exposed edge of the shoulder blade.

Any other change or suggestion?

MR. KUNKLE: Mr. Chairman, I wonder about the New York shoulder being cut in two, to make a Boston butt and a fresh picnic. Will there be any subsequent trimming or will we be weighing the two pieces and have a typical New York style shoulder?
MR. COLE: No, there will have to be subsequent trimming and that probably should be included. That is under 2 (b).

MR. KUNKLE: That is right.

MR. COLE: And there probably should be something to the effect that some trimming should be done on the Boston butt and picnic. That probably was left out. Would you like to phrase something on that, Mr. Kunkle?

MR. KUNKLE: I would like to leave it simple to myself, but that is up to you folks.

MR. COLE: What would you say would be simple?

MR. KUNKLE: The way it is.

CHAIRMAN BRAY: On separation of the Boston butt from the picnic shoulder one-half inch below exposed blade bone you run into some trouble. You are not going to come at the smallest part of the blade bone every time you cut it one-half inch below the blade bone, or at least that is our experience. We have tried it and many times we get a rather long exposure of the blade bone left in the picnic. But some packinghouse people tell you to use the large arteries that go to the shoulder, as reference points. Also they say, I believe, to cut an inch and a half or an inch and a quarter above them, and you will always come to the small part of the blade bone.

Then another thing, if you are talking about trimming a picnic, commercially, of course, the lip is always removed from the picnic. That is that lip meat that fits around the top of the inside of the picnic.

MR. COLE: All right, we will make those necessary changes, trimming picnic and Boston butt. Any other suggestions for changes? If not, let's entertain a motion that this portion of the report be accepted.

MR. NAUMANN: I so move.

MR. ADAMS: Second.

MR. COLE: All those in favor of it let it be known by saying "aye"; opposed. (Carried)

Standard Methods of Measuring and Grading was Mr. Lowell Strong's portion. He is not here today and Mr. Pierce, of the United States Department of Agriculture, was going to be with us and he is not with us either. These recommendations are exactly as they were given last year, I believe, and demonstrated to you. Do you have any suggestions for additions or changes in that portion?

Briefly, we have suggested only two definite measurements, length and thickness of back fat, and we have recommended that the grading be done according to the United States Department of Agriculture standards.

MR. ZIEGLER: Which standards?

MR. COLE: Choice 1, 2 and 3. Any comments concerning this?
MR. MACKINTOSH: Isn't there any better descriptive term than "boot jack." It is a new one on me.

MR. COLE: That is back on cutting. That is another of Lyman's terms. Apparently, he picked it up around Cudahy or somewhere. I think you all know what we are talking about.

MR. MACKINTOSH: There is only one thing it can be, it seems to me.

MR. COLE: I think you will all admit that it is much easier to demonstrate and do these things than it is to try to write them down on paper.

On these measurements, if you have no questions we will move right along because time is getting away from us.

MR. HANKINS: Mr. Chairman, the thickness of back fat in No. 2, "three measurements, including skin." I object to the inclusion of the skin. Skin is not fat. I think I am correct in saying that from studies that have been made, and we are studying the relation between thickness and back fat and the over-all fatness of the hog and the skin has not been included. At least that is true in our work at Beltsville. I fully appreciate the fact that I am disagreeing with another unit of the Department of Agriculture on this. I am sorry, but being honest with myself I feel I must. So I object to the inclusion of the skin.

And I should like to point out also that in studies made some time ago we found that the measurement of the back fat at the seventh thoracic vertebra came nearest to being the same as that of the average of all. That was when we took five different measurements and correlated each one with the average and the measurement at the seventh thoracic was most nearly like the average. So I would raise the question there whether we are missing something by omitting the measurement at the seventh thoracic vertebra.

MR. COLE: Do you want to incorporate in there that it be substituted for the three measurements or --

MR. HANKINS: No, I would not go that far, but I think the seventh thoracic vertebra measurement of the back should be in.

MR. COLE: We should point out that it is a good measurement if a single measurement is to be taken.

MR. HANKINS: And on that ground you would not seem likely to throw it out when you are taking several.

MR. COLE: As to this matter of skin. Of course, you all know why it is in there. The committee was in agreement that was the way it should be. Of course, the United States Department of Agriculture's standard is based with the measurement of the skin included, and we are recommending that we use these tentative grades. I think personally that even though they have their faults they are really something good to shoot at. They are something we can refer to. We all know what we are talking about. It is here, a standard, so we think that it should be adopted, and that is why we have included the skin.
MR. HANKINS: It depends entirely on what your objective is. If you merely wanted to predict a grade from the measurement of the thickness of the back fat I don't suppose I would argue with you too much. If you want to know how fat the hog is that is something else.

MR. COLE: My next question would be how much difference is there in skin thickness? Do we have anything to show that there is a significant difference?

MR. HANKINS: I cannot show you any figures but from observation we know there is considerable variation.

MR. RUST: I think that the inclusion of skin in these fat measurements just introduces one more variable, and I personally think from the measurements we made we excluded the thickness of the skin, and also in these carcass studies that we made we included the fat back thickness at the seventh thoracic vertebra, giving us a total of four measurements to use in our work.

I should like to place it in the form of a motion that we amend this recommendation to exclude the skin in the thickness of the fat back measurements and to include the thickness of the fat back measurement at the seventh thoracic vertebra.

MR. COLE: Do you want it included as an optional on the seventh thoracic? In other words, if you take 4 you should take 5.

MR. RUST: Well, I think, in line with this work that has been done where they have found it closely equals the average of the three, it is probably just as well to include it.

MR. COLE: All right, there is a motion before the house that we delete the words "including skin" and add "seventh thoracic vertebra."

MR. MACKINTOSH: I think it would be well just to change that "including" to "excluding," so there will be no question in anyone's mind.

MR. COLE: Excluding skin.

MR. KEMP: If these measurements are primarily set up to conform with these tentative standards, which I think they are, unless the United States Department of Agriculture is going to exclude skin, I don't think we should. If they change the wording of the grades to exclude skin, we should, but if we are setting up standards we had better go along with them.

MR. HANKINS: That is the reason I said it depends on what your objective is.

MR. COLE: I think they will tell you that you can add one-tenth of an inch and come out very close to the objectives of the grading laws.

MR. ZIEGLER: The skin runs about 2 millimeters.

MR. OLIVER: Where do you draw the line between the skin and the fat of the hog?
MR. COLE: Do we have any discussion about the motion that is before the house? All right, let's call for the question. Those in favor of changing the second portion to read "excluding skin and including the seventh thoracic vertebra" let it be known by raising your right hand; those opposed. We have 17; against 16.

MR. BRADY: I think your motion should be stated so as to include what this measurement is going to be used for, and if the measurement is going to be used for carcass grades include the skin. If it is to be used for something else, it will be out. I think that would probably satisfy everybody.

MR. COLE: Do you want to amend the motion to that effect?

MR. BRADY: I would prefer that whoever made the original motion do it.

MR. COLE: I don't believe that motion ever got a second, by the way.

MR. ADAMS: No, it did not. I did not vote on it either.

MR. COLE: So I suppose we can include it in the motion and vote over on it.

MR. BRADY: In other words, you can see that you might have both measurements, if you were doing a detailed study, for example.

MR. HINER: Isn't the variation within the grade on the average thickness enough to allow for the tenth of an inch addition?

MR. COLE: No, it isn't. A tenth of an inch will throw it down or up a grade very easily.

MR. WANDERSTOCK: You are introducing a loophole which will enable us to use either method and sometimes we are not going to worry about what the purpose actually is. I think to have it one way or the other is better than average.

MR. HANKINS: Mr. Chairman, I agree with Dan Brady's suggestion. I would like to second the motion. But I would like to suggest that we specify that where the primary objective is the estimation of the over-all fatness of the pig, back fat measurements, excluding skin, be taken.

MR. COLE: All right, let's vote on a motion of that kind.

MR. KUNKLE: A question before you vote, please. We would like to ask, are these standards tentative or have they been accepted as of last spring?

MR. ZIEGLER: They have not been accepted. They are being used.

MR. MACKINTOSH: There is another little question that comes up. We now have a method by means of which one can measure the depth of the back fat on the live hog very simply, and I understand it is being done in a good many cases where hogs are later being slaughtered. Of course, they
are including thickness of the skin there, but I think if you want it you have to make both of them.

MR. COLE: We make reference to that in pork later on. That reference is cited in the recent issue of the Journal, for instance.

MR. FRANCIONI: I would like to raise a question. Are we going to use millimeters in beef and inches in pork?

MR. COLE: According to the conference we voted on millimeters in all respects. If it is in here in tenths of inches it is an error.

The motion is that in those cases where research is aimed at determining the fatness of the pig we should exclude skin and if our research is geared toward grade standards we should include skin. Is that the way you want it?

MR. BRADY: That is essentially correct. But I think the purpose of what the research is intended for should be clearly stated.

MR. COLE: Do you understand the motion well enough to vote on it? All right, those in favor let it be known by raising their right hands; those opposed. It looks like that is passed.

MR. HANKINS: What about the other point?

MR. COLE: The seventh thoracic vertebra. Do we want to have a motion that it be included?

MR. MACKINTOSH: I so move that we include the measurement of fat back at the seventh thoracic vertebra.

MR. COLE: Is that going to be in addition or optional?

MR. MACKINTOSH: I would recommend that in making measurements on experimental hogs, it be made anyway. It is a simple matter to make that measurement.

MR. FRANCIONI: I hate to be bobbing up but I don't like this word "optional" if we are going to unify our work.

MR. COLE: The only question I would raise is when you figure average thickness of the fat back does it figure in?

MR. MACKINTOSH: Absolutely.

MR. COLE: If that is clear, there is a motion and do I hear a second?

MR. DEANS: Second

MR. COLE: Any discussion?

MR. HANKINS: May I suggest that all four measurements be taken, the three that you have specified plus the additional one of the seventh thoracic vertebra, and then naturally you would average those four.
MR. COLE: All right. Time is running out here. Is there any further discussion? All those in favor of the motion as explained and made let it be known by raising the right hand; opposed. (Carried)

I do think that part of your report, concerning monetary value or price summary, might merit some comments from you. I got this sheet from Lyman Bratzler, and I believe North Carolina had some work especially on this price index. I think we are faced with the necessity occasionally of putting a monetary value on a hog in terms of evaluation, and this is an attempt to put down some prices that could be used, standard prices.

What is your comment concerning this? Brown, of North Carolina, you worked on this. What is your comment?

MR. BROWN: The purpose was to do the breeding and, second, to develop a simpler index. The index in use at the present time or that had been in use up to the time of the work on this index is one that was proposed by Dr. Dickenson along the same line and modified to fit the conditions of our laboratory. It was, I might say, rather cumbersome. It was hard to handle. It required a number of measurements -- about 31 measurements -- and some weights before you could arrive at an index value. An index now of carcass values allows unusually high merit in one portion or cut to make up for deficiencies in one of the other cuts. So after we used this modified index to determine the differences due to breeding we set out to find a little simpler method of evaluating these carcasses with a fewer number of weights and measurements. We determined simple correlations to decide which measurements were correlated closely with the modified Dickenson index, and assumed it to be the correct estimate of the carcass value.

There are two things that our study brings out. One is that the area of the eye muscle is pretty important. It was correlated about .8 with the modified index value. Also the percentage of lean cuts were very highly correlated with this modified Dickenson index value. It was very hard to decide how much weight there should be per square inch increase in area of loin muscle. So we decided to use the primal cuts, these three cuts that you see listed on your sheets, and to use them as an index and compare this index with the modified Dickenson index and another index that we had at North Carolina. This short index compared very favorably with the other indices. We ran breeding groups according to average and found that the breeding groups remained practically the same whether we used this short index or whether we used the longer index that required more measurements.

This index, as you will see on your sheet, makes use of relative prices, and the relative price of loin was taken as loin equivalent 1, and the ham and shoulder were rated according to this. For quick check on the carcass you can add the weight of the ham and the weight of the loin and take three-quarters of the weight of the shoulder and come out with a pretty good estimate of the index value of that carcass.

MR. COLE: Unless you have further comments, we are going to call it quits.
CHAIRMAN BRAY: Thank you, Professor Cole. It is five minutes to one. Let's be back here five minutes to two, ready to go.

(The meeting adjourned at 12:55 o'clock.

# # #