4-H Animal Science Lesson Plan
Quality Assurance
Level 3

Using grids to determine carcass measurements

Scott Nash, Regional Youth Development Educator

Goal (Learning Objective):

To learn how to measure ribeye/loin eye area and fat thickness on cattle, lambs and hogs.

Supplies Needed:

- Plastic grid cards – to be used for measuring a beef and lamb ribeye area and swine loin eye area. (If you don't have the ability to use a plastic grid card, make a paper copy of the card, place it in a gallon Ziploc bag and trace the dots with a sharpie marker. Place the ribeye picture inside the bag and count the dots within the longissimus dorsi muscle area.)
- A copy of the Beef grid can be found on page 8-7 in the Ohio Beef Resource Handbook.
- A copy of the grid to be used for swine and lamb can be found on page 4-155 in the Ohio Swine Resource Handbook. (If you can't get a copy of a plastic grip card make a paper copy of the grid and put copy in a sheet protector (or gallon Ziploc bag.) Use a permanent marker to copy the dots onto the sheet protector, pull to grid copy out. Place the item to be traced inside or behind the sheet protector and count the dots.)
- Soda pop can(s)
- Deck of playing cards
- Color pictures of beef and lamb rib eyes. The pictures are also used in the Quality and Yield Grade Lesson.
- Color pictures of swine loin eyes. The pictures are also used in the Quality and Yield Grade Lesson.
- Print a copy of the Carcass Measurements Key. It will provide the measurements for the pictures used in this lesson.

Pre-Lesson Preparation:

- Measure the soda pop can and deck of cards. Take time to make sure the ribeye and loin eye pictures have different muscle size and different amounts of fat thickness so the youth can determine differences. Measure the pictures in advance so you will have the answers for the youth after they have measured each.
- *Study or teach the USDA Quality Grade and Yield Grade Lesson prior to teaching this lesson*

Lesson Directions/Outline:

- Background information
  - The plastic grid is used to measure the size of the longissimus dorsi muscle, ribeye area in beef and lamb and loin eye area in swine. Remember from the Quality Grade and Yield Grade lesson that ribeye area in beef and lamb are an important factor in determining yield grade. Loin eye are in swine plays a role in USDA grade. Each dot on the grid is equal to one square inch in muscle area. Count the number of dots that are inside of the muscle to determine the total area in square inches. For example: If you count 127 dots in the beef ribeye then the total area is 12.7 square inches. For sheep and swine use the gird with smaller dots (Grid found on page 4-15 in the Ohio Swine Resource Handbook.) Count the total number of dots and divide by 20. For example, if you count 132 dots, divide 132 by 20 for a 6.6 square inch area.
  - Use the ruler grid on the side of the of the plastic grid sheet to measure fat thickness. One line equals 1/10 of an inch. (You can also trace the rule gid on the same Ziploc bag.)
  - Currently there are not any USDA carcass standards for meat goats. Measuring the ribeye and fat would be done the same way but it is not an industry practice for meat goats.

- **DO: Conducting the activity**

- Using the grids or Ziploc bags have the youth measure the size of the deck of cards (then the soda pop can and then put them both together) by counting the dots.
- Have youth measure pictures of rib eye areas and swine loin eye areas including the fat thickness. Have youth write down answers.

- **REFLECT: What did we learn?**
    - Did everyone get the same numbers? Why or why not? Why is the size of the muscle and the amount of fat hard for a judge to determine on the live animal? How will these measurements help determine the yield grade of the animal?

- **APPLY: Why is that important?**
    - How will knowing the amount of fat and muscle in my project help in the selection of my next animal project? What can I do to promote Quality Assurance by participating in this activity? What impact can I have on the consumer when I understand Quality Assurance?

References

Beef Resource Handbook. (2011). Beef Carcass Evaluation. (pages 8-6 through 8-11 and Color Photo (CP) CP-18). Ohio State University Extension.

Sheep Resource Handbook for Market and Breeding Projects. 2011. pgs. 74 – 76. Ohio State University Extension.

Swine Resource Handbook for Market and Breeding Projects. 2000. pgs. 4-14 – 4-15. Ohio State University Extension.

Goat Resource Handbook. 2008. Pgs. 118-126. Ohio State University Extension.

Additional Resources

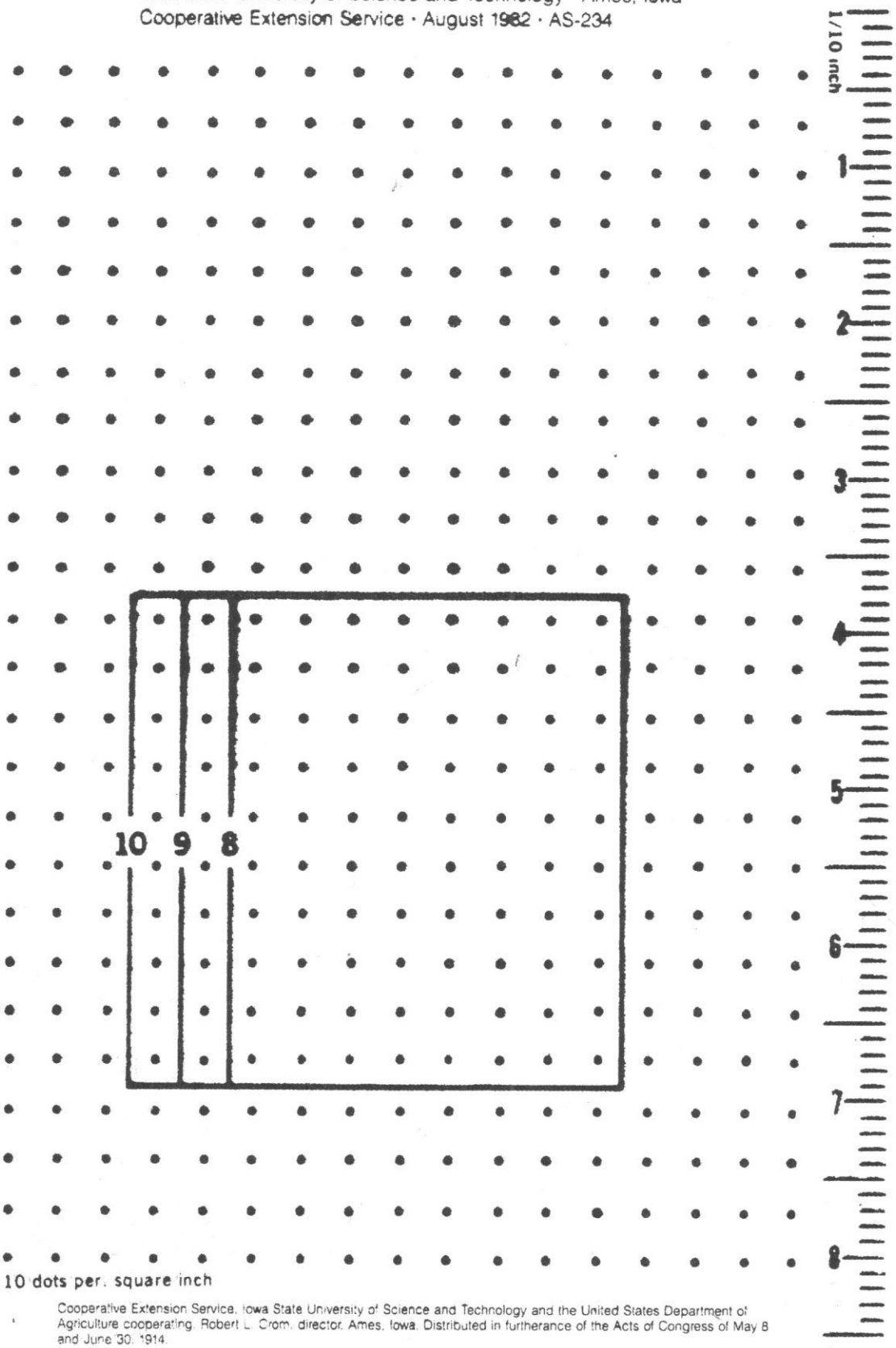
Beef ribeye pictures can be found in the Meat Evaluation Handbook. American Meat Science Association, 2001. pgs. 29-44.

Lamb ribeye pictures can be found in the Meat Evaluation Handbook, American Meat Science Association, 2001. pgs. 124-125 and 130.

Pork loin eye pictures can be found in the Meat Evaluation Handbook, American Meat Science Association, 2001. pgs. 98-99.

Carcass Measurements Key will provide the measurements for the pictures used in this lesson.

Example of plastic grid card used for measurement of loin eye (beef rib eye area)



(Figure 8.06)

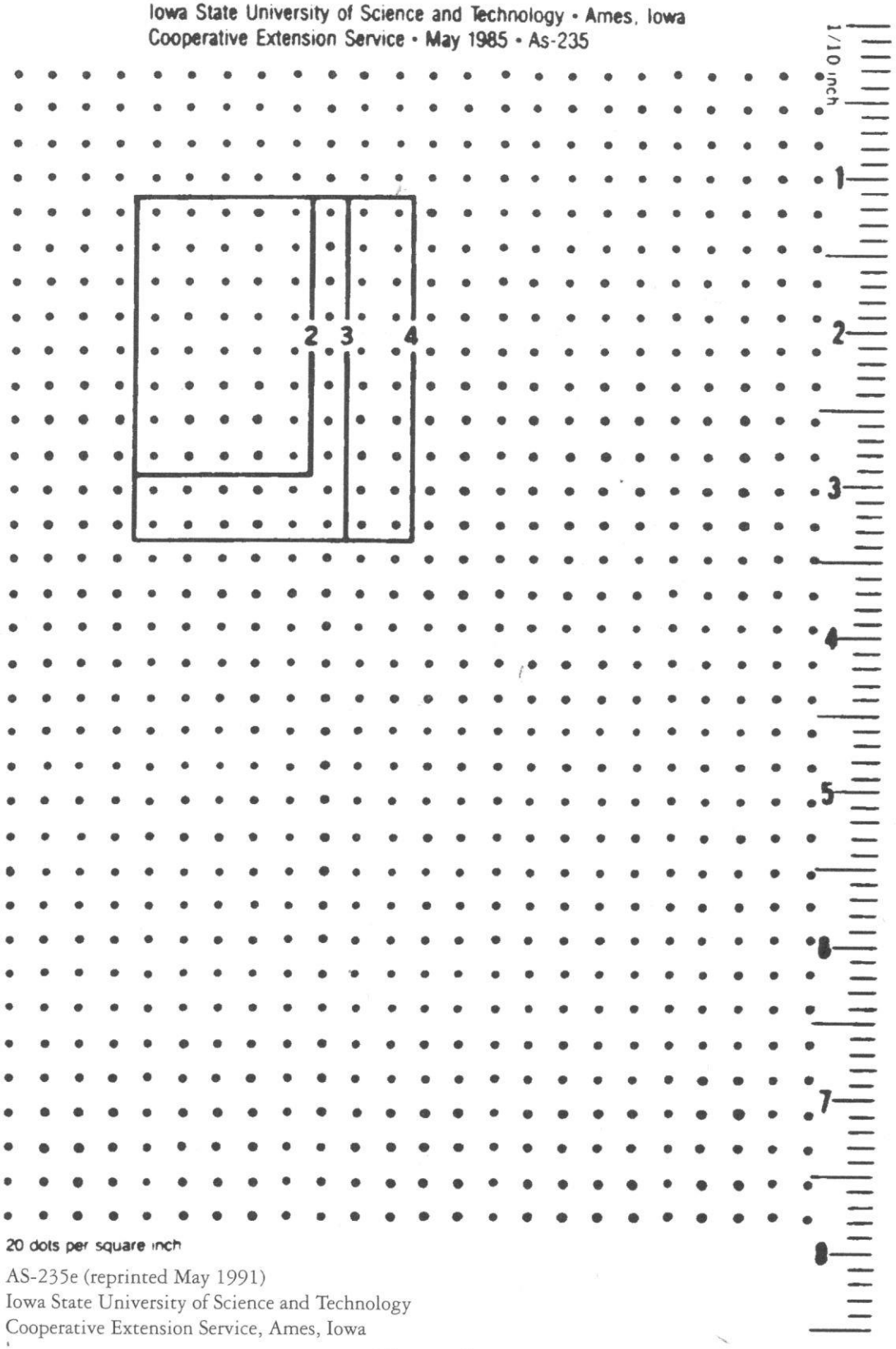


Figure 4.7
Plastic grid for measuring loin eye

Carcass Measurements Lesson Key

Beef Ribeye Measurements (10 dots on the beef ribeye grid = 1 square inch)

Picture #132 – Total number of dots = 134 for a ribeye area of 13.4 square inches
Measured with .35 inches of fat thickness

Picture #68 – Total number of dots = 105 for a ribeye area of 10.5 square inches
Measured with .20 inches of fat thickness

Picture #1509 – Total number of dots = 126 for a ribeye area of 12.6 square inches
Measured with .55 inches of fat thickness

Picture #122 – Total number of dots = 110 for a ribeye area of 11.0 square inches
Measure with .60 inches of fat thickness

Lamb Ribeye Measurements (20 dots on the swine loin eye grid = 1 square inch)

Picture #82 – Total number of dots = 56 for a ribeye are of 2.80 square inches
Measured with .15 inches of fat thickness

Picture #132 – Total number of dots = 53 for a ribeye area of 2.65 square inches
Measured with .25 inches of fat thickness

Picture #90 – Total number of dots = 46 for a ribeye area of 2.30 square inches
Measured with .20 inches of fat thickness

Picture #2727 – Total number of dots = 73 for a ribeye area of 3.65 square inches
Measured with .20 inches of fat thickness

Swine Loin eye Measurements (20 dots on the swine loin eye grid = 1 square inch)

Picture #226 – Total number of dots = 150 for a loin eye are of 7.5 square inches
Measured with a backfat thickness of 1.00 inch

Picture #1874 – Total number of dots = 116 for a loin area of 5.8 square inches
Measured with a backfat thickness of 1.10 inches

Picture #1889 – Total number of dots = 110 for a loin eye are of 5.5 square inches
Measured with a backfat thickness of .50 inch

Picture #1427 – Total number of dots = 196 for a loin eye are of 9,8 square inches
Measured with a backfat thickness of .50 inch

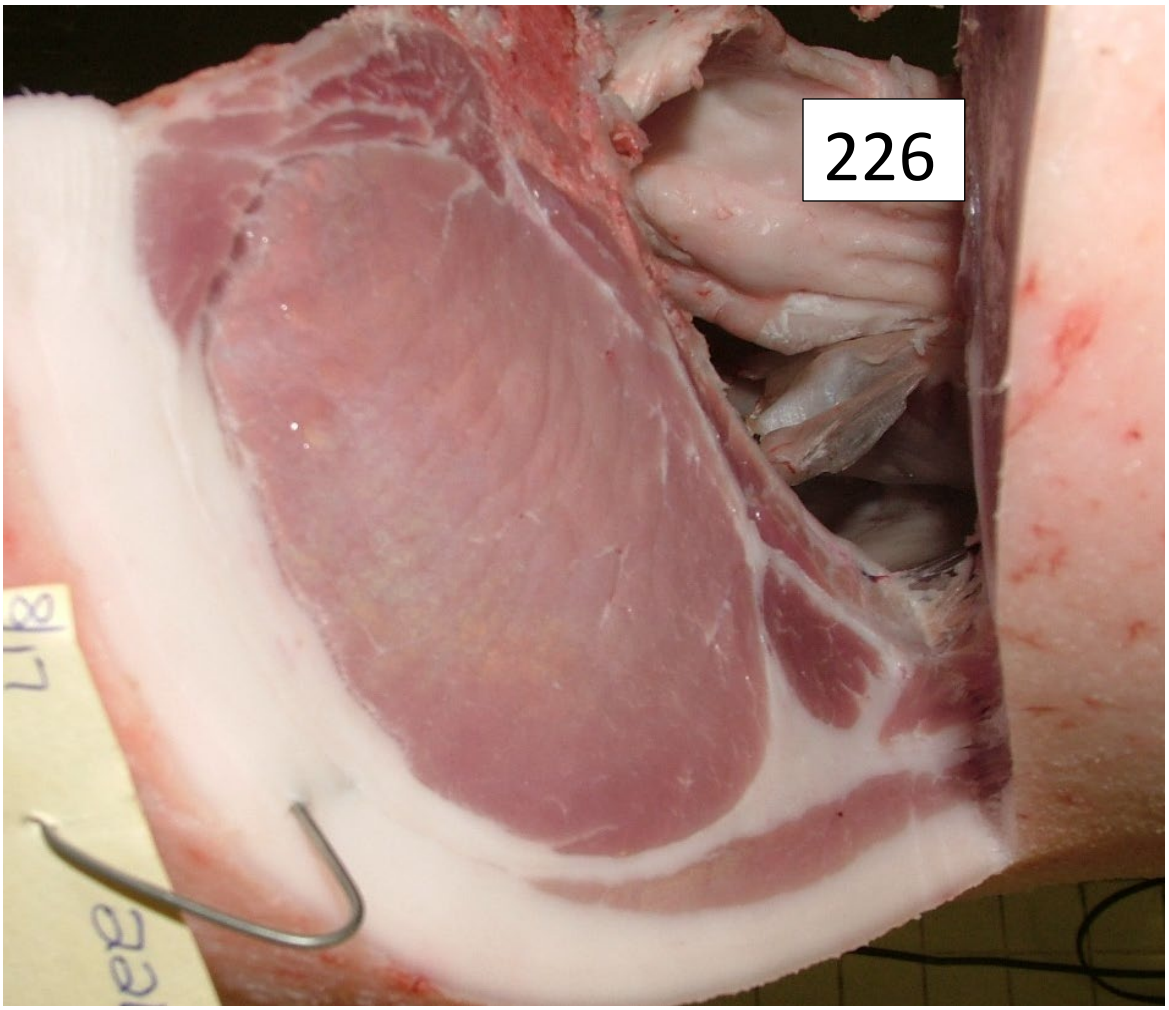
QUALITY ASSURANCE: IDEAL MARKET ANIMAL – BEEF RIBEYE PHOTOS
Photo Credit: Cindy A. Kinder

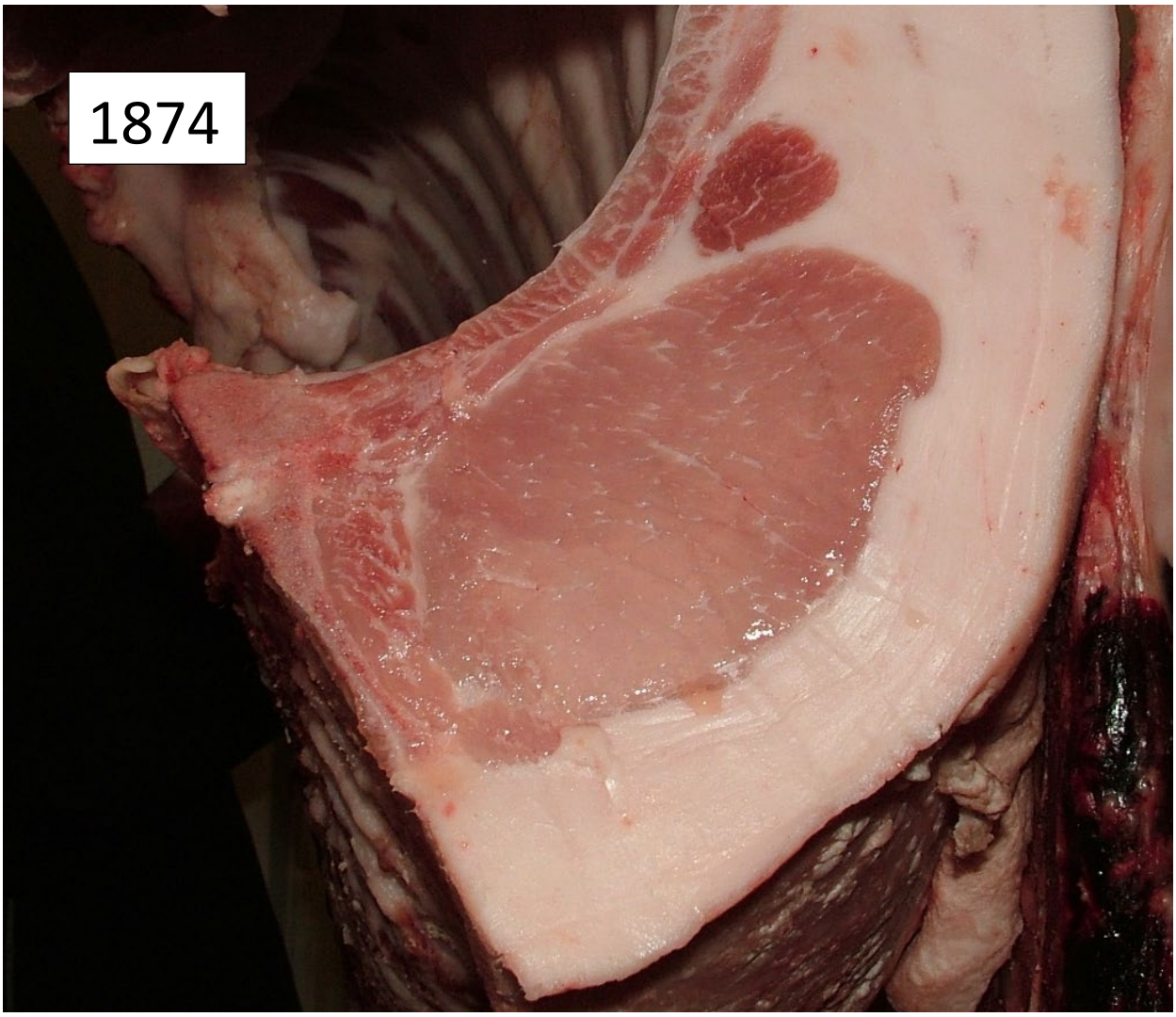
68

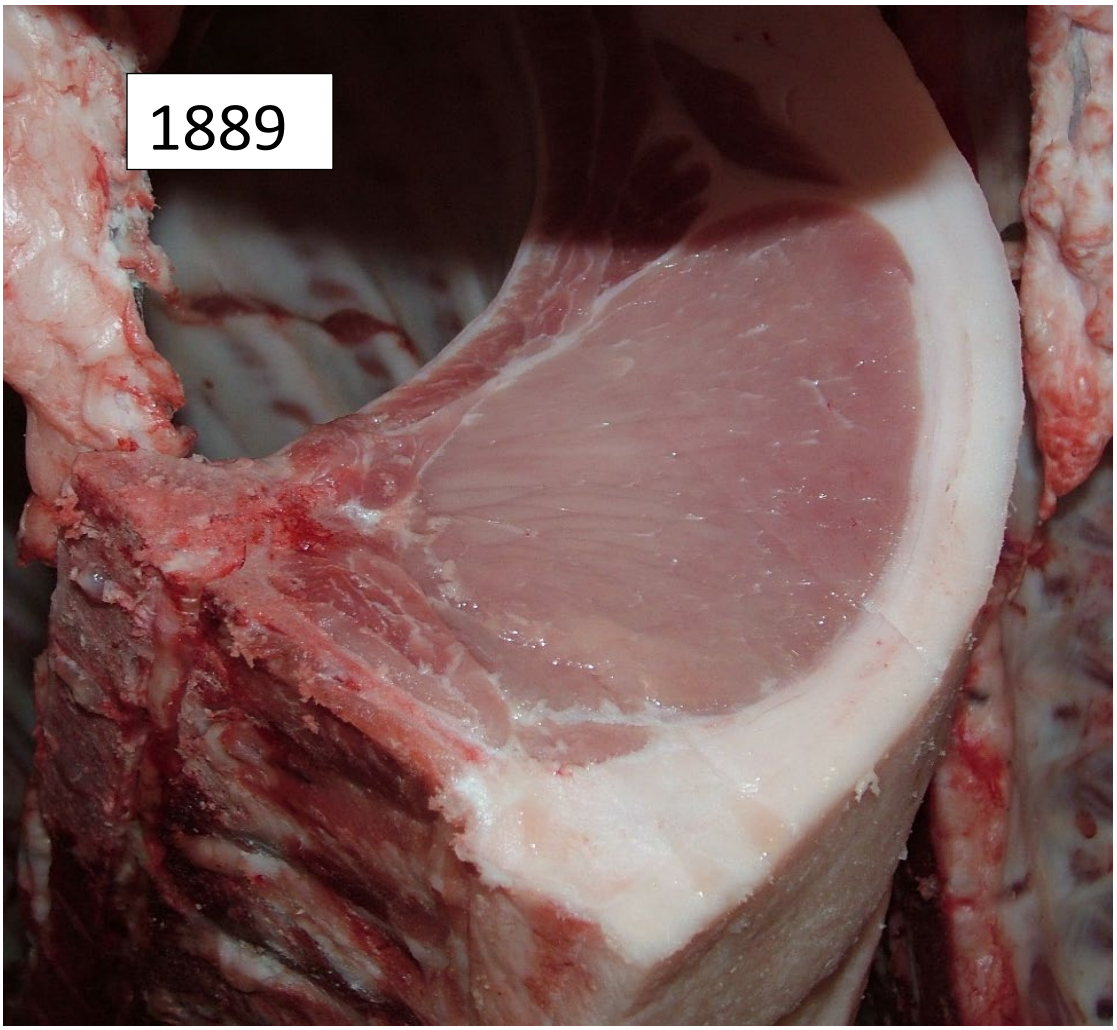
122

1509

QUALITY ASSURANCE: IDEAL MARKET ANIMAL – SWINE LOIN EYE PHOTOS
Photo Credit: Cindy A. Kinder

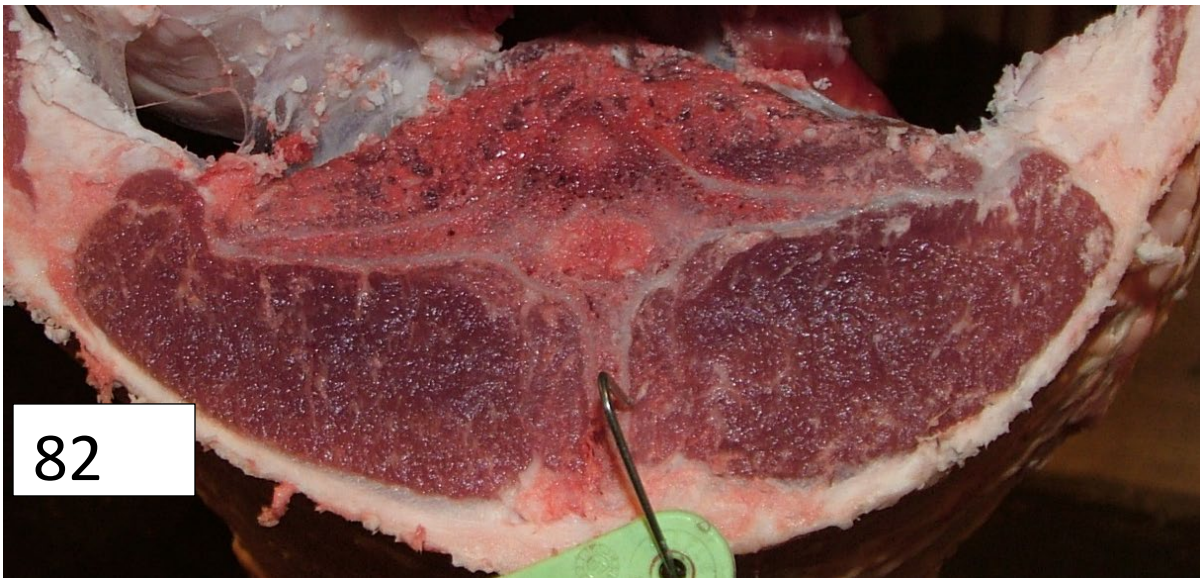


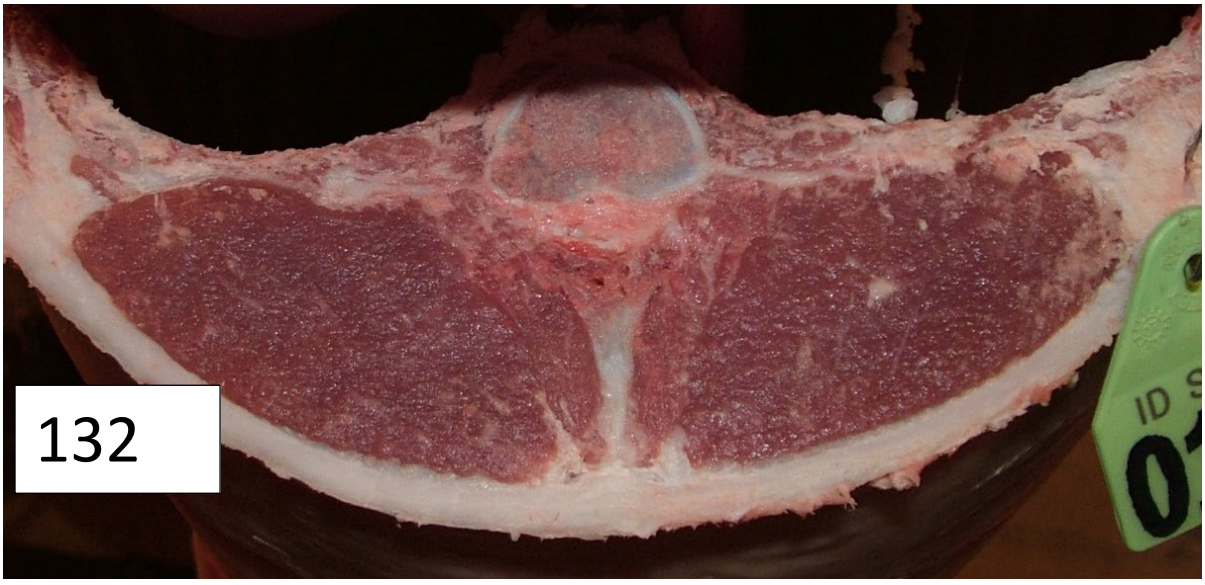

1874


1889

1427

QUALITY ASSURANCE: IDEAL MARKET ANIMAL – LAMB RIBEYE PHOTOS
Photo Credit: Cindy A. Kinder





90

2727