USDA Quality Grade and Yield Grade

Scott Nash, Regional Youth Development Educator

Goal (Learning Objective):

- To learn the USDA Quality Grades of beef and lamb.
- To learn the difference between quality grades and yield grades.
- To learn the USDA Pork Grades and factors influencing pork quality.

Supplies Needed:

- A copy of each of the color pictures of USDA Marbling Scores for Beef (attached to this lesson.)
- A copy of each of the color pictures of beef and lamb rib eyes (attached to this lesson.)
- A copy of each of the color pictures of swine loin eyes (attached to this lesson.)
- Flipchart paper and markers.

Pre-Lesson Preparation:

- Become familiar with the factors used to determine quality grade in beef and lamb. Become familiar with the how yield grade is determined in beef and lamb. Become familiar with how USDA grade is determined in swine and the factors that influence pork quality.
- *You may want to assign this lesson to an older youth to learn about and teach the other youth at the meeting.

Lesson Directions/Outline:

Background information

- Ask the youth to list what they know about quality and yield grade. Quality grades in beef and lamb are used to predict palatability (eating quality) characteristics such as tenderness, juiciness and flavor. Beef carcass quality grades are based on maturity and marbling. Maturity is the age of the animal. Most youth raised market animals are less than 30 months of age and considered young animals. Marbling is the intramuscular fat (the small flecks of fat inside the muscle) that can enhance the flavor, juiciness and tenderness of the meat. A higher amount of marbling means a higher quality grade. Beef quality grades for young animals are Prime, Choice, Select and Standard. To determine quality grade, once a carcass has been split into two halves it is cut or ribbed between the 12th and 13th ribs. This exposes the ribeye area allowing the marbling to be viewed in the meat. The amount of marbling is the key factor in determining quality grade. The more marbling the higher the quality grade. Prime and Choice carcasses typically provide the better eating experience and are in higher demand by consumers (Beef Resource Handbook pgs. 8-2 – 8-3.)

- The quality grade of a lamb carcass is based on conformation, maturity, flank streaking and amount of external fat. The lamb should be younger than 12 months of age. Most youth raised lambs are approximately 8 months old. Flank streaking is the amount of fat on the surface of the flank muscle (Sheep Resource Handbook pgs. 73-75.) Lamb quality grades are Prime, Choice, Good and Utility.

- Yield grade in beef refers to the expected yield of boneless, closely trimmed retail cuts and is determined by considering external fat thickness, ribeye muscle, hot carcass weight and kidney, pelvic and heart fat. The single factor used in determining lamb yield grade is the amount of external fat. Yield grades are expressed in numerical scores ranging from 1 through 5. Yield grade 1 is more desirable because it represents a leaner carcass with more muscularity. When a carcass becomes fatter and/or is less muscular the numerical yield grade becomes higher. A yield grade 5 is the least desirable because it will have more fat in proportion to muscle and represents the lowest yield of actual meat. When the carcass

has been cut or ribbed between the 12th and 13th ribs the amount of external fat thickness can be measured as well as the size of the ribeye. These measures will help determine a preliminary yield grade for the animal.

- A trained ultrasound technician can collect an image by scanning the animal to get a picture of the ribeye area and fat thickness between the 12th and 13th ribs. This will allow the technician to estimate quality grade of beef as well as estimate yield grade of beef and lambs.

- USDA grades in swine range from U.S. No. 1 to U.S. No. 4. The numerical grades are based on expected muscle yield of four lean cuts—ham, loin, Boston shoulder and picnic shoulder. A U.S. No. 1 hog has less than 1" inch backfat and a U.S. No. 4 hog has greater than 1.50" inches of backfat. The numerical grade can move up or down based on the amount of backfat and amount of muscle. However, a carcass with backfat of 1.75" or greater must be graded a U.S. No. 4. Typically, USDA grade is determined in swine by measuring the amount of fat and loin eye area between the 10th and 11th rib using ultrasound or by cutting (ribbing) the carcass in that spot after the animal has been harvested (Figure 4.1 and 4.3, Swine Resource Handbook pg. 4-5.)
- Pork quality is determined by muscle color, muscle firmness, marbling (intramuscular fat) and external fat (Swine Resource Handbook pg. 4-16 and 4-17.)

- Since the meat goat industry is relatively new, there are not any official standards for meat goat quality and yield. In Chapter 8 Ohio State University Goat Resource Handbook on page 118 it shares many of the selection criteria for meat goats are based on visual evaluation. Table 8.1 on page 119 lists projected carcass weights based on various live weights. Table 8.2 on page 120 discusses wholesale cuts and weights. Page 124 has a chart of Chevon wholesale cuts.
- Goat meat is not readily available in grocery stores but can be found in specialty markets, small butcher shops and farmers markets. More information about goat carcasses and grading can be found in the resource section from the University of Kentucky.

- One environmental factor that can impact carcass quality (acceptability) of all the species is stress. This refers to the stress (or lack thereof) the animal experiences while it is being cared for. Stress can be influenced by animal management, nutrition, animal husbandry and even animal hauling. An animal placed under stress by not having the proper care in any of these areas can cause a reduction in carcass quality and result in a low merchandising value of that carcass. For example, stress in beef cattle will cause the meat to be dark and the carcass referred to as a "dark cutter".
- For more information on quality assurance refer to the "Why is Quality Assurance Important?" lesson is this series.

Conducting the activity

1. Review the beef quality grade pictures from the attached **M**arbling Photos. Shuffle the pictures and have youth organize them in order from most to least amount of marbling. Have the youth share why they ranked the marbling photos in that order.

2. Distribute the beef ribeye pictures. Have the youth rank them in order from best potential yield grade to worst. Ask the youth to explain the ranking.

3. Distribute the lamb ribeye pictures. Have the youth rank them in order from best potential yield grade to worst. Ask the youth to explain the ranking.

4. Distribute the swine loin eye pictures. Have the youth rank them in order from best potential USDA Grade to worst. Ask the youth to explain the ranking.

Additional activities:
Cupcake Activity found in the Youth Beef Quality Assurance PNW 593 pgs. 41-43
Why is Quality Assurance Important? Found at: http://www.uidaho.edu/extension/4h/projects

What did we learn?

- What are two factors that help determine quality grade in beef? In lambs?
- Explain the difference between Quality Grade and Yield Grade.

- What factors determine USDA grade of swine? What factors determine pork quality?

Why is that important?

- Why should Quality Grade in beef or lamb or the U.S. No. grade of swine matter to the consumer?
- Why is it important to the producer to have a lower Yield Grade number in beef or lamb and lower U.S. No. grade in swine?
- What impact does animal stress have on carcass quality?

References

Beef Resource Handbook. 2011. Chapter 8, pages 8-3 through 8-9. Ohio State University Extension.

Swine Resource Handbook for Market and Breeding Projects. 2000. Chapter 4, pages 4-4 through 4-6 and pages 4-16 through 4-19. Ohio State University Extension.

Sheep Resource Handbook for Market and Breeding Projects. 2011. Chapter 6, pages 73-75. Ohio State University Extension.

Goat Resource Handbook. 2008. Chapter 8, pages 118-125. Ohio State University Extension.

Goats; More than just a lawn mower Grading and Carcass ...
www.uky.edu › instruction › asc300

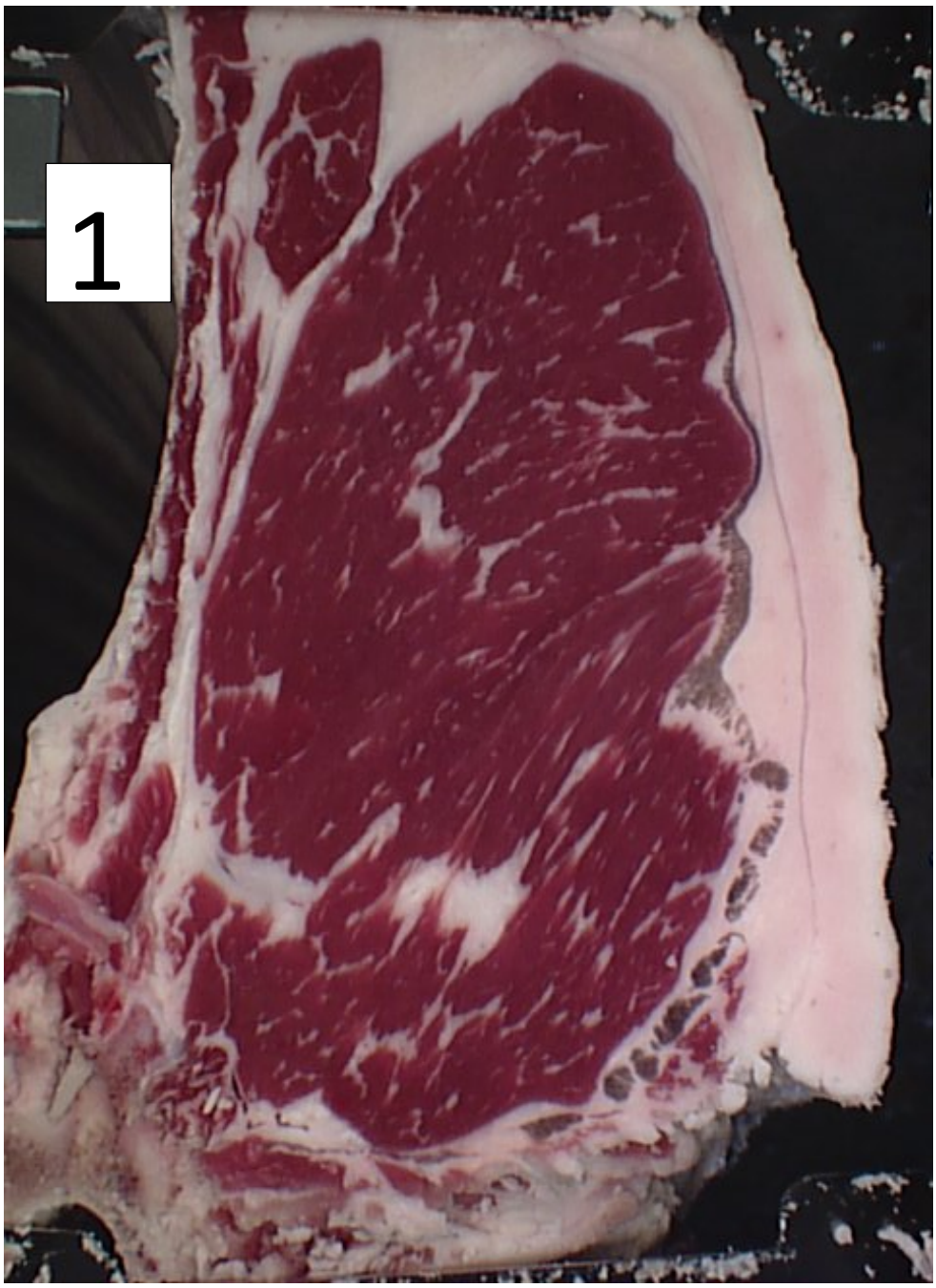
Youth Beef Quality Assurance PNW 593, pgs. 41-43.

Additional Resources:

Meat Evaluation Handbook, American Meat Science Association. 2001. Beef Grading, pgs. 25-27.
Meat Evaluation Handbook, American Meat Science Association. 2001. Lamb and Mutton Grading, pgs. 120-122 and 124-125.
Meat Evaluation Handbook, American Meat Science Association. 2001. Pork Grading Composition and Grading, pgs. 87-90, 93 and 98-99.

Quality Assurance is really a term used for animal care and management as it relates to meeting well being guidelines and production of a safe wholesome product for consumers. If this is to be linked to Quality Assurance then there needs to be an emphasis on reduction of stress in animal care which impacts quality in Beef lamb and pork... yield and eating experience is linked to quality but are ways to market food animal products. yield and eating experience are not a food safety issue. and pork quality was not covered.

Beef Cattle Degree of Marbling Pictures for Quality and Yield Grade Lesson



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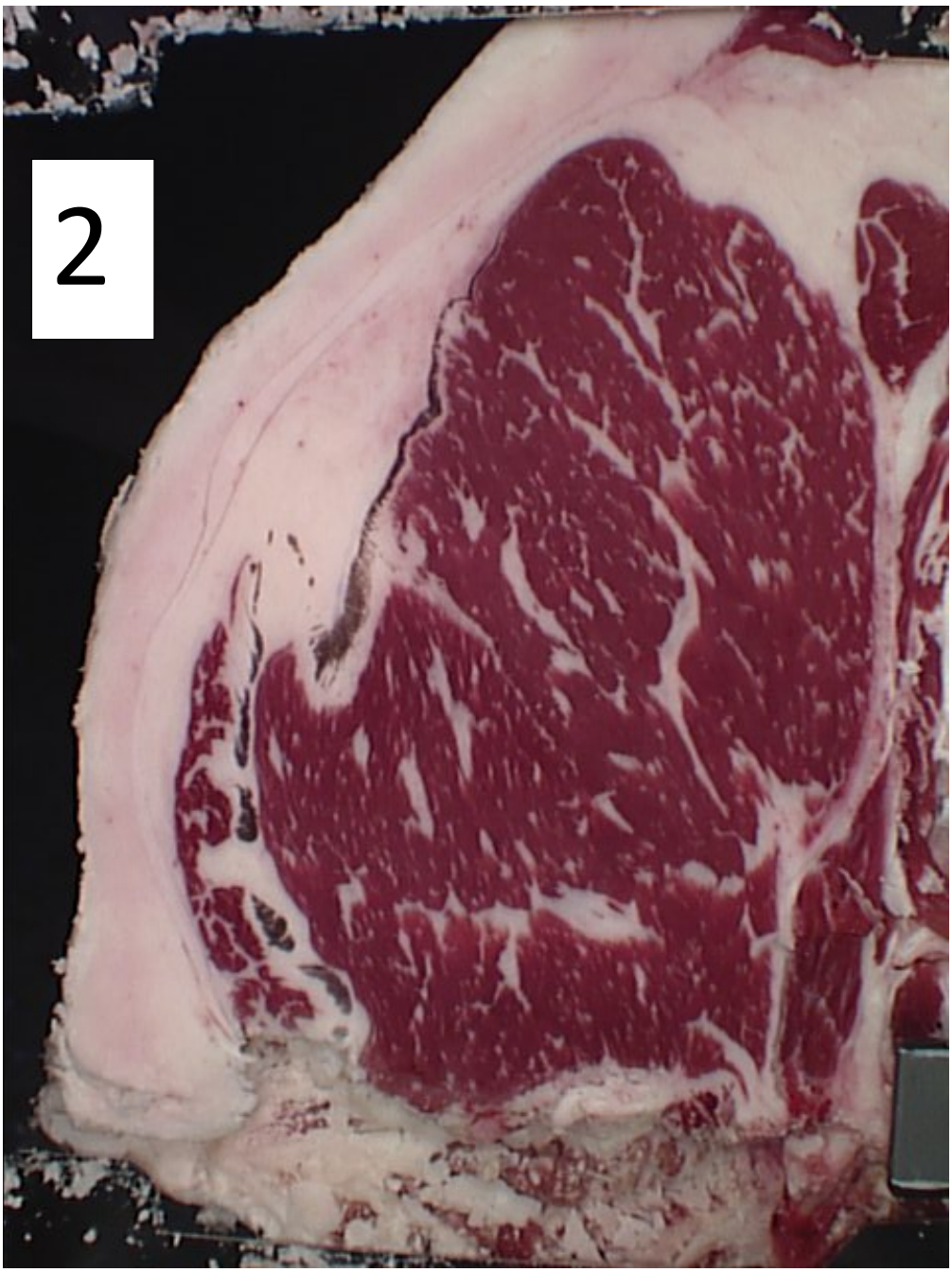

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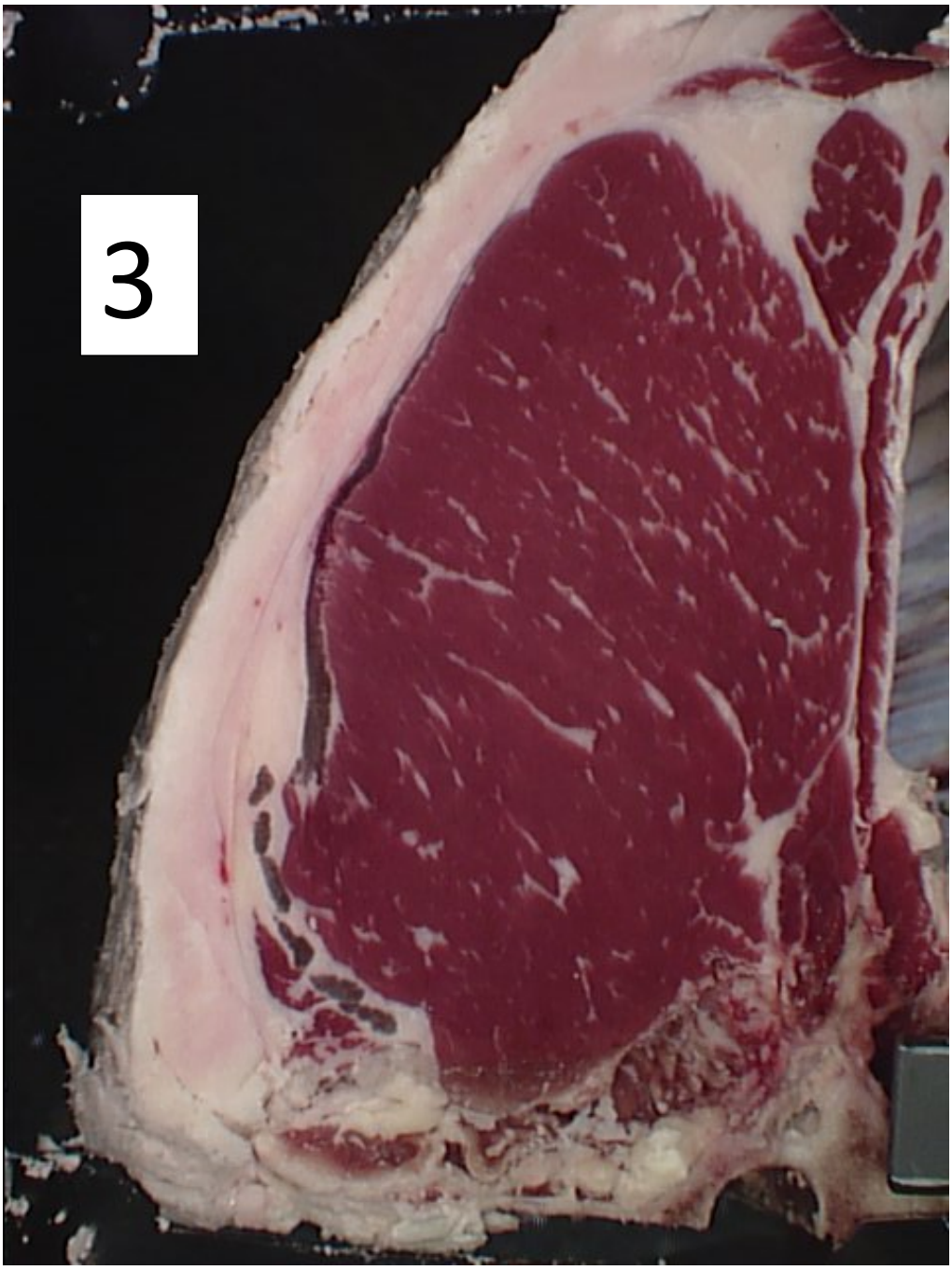

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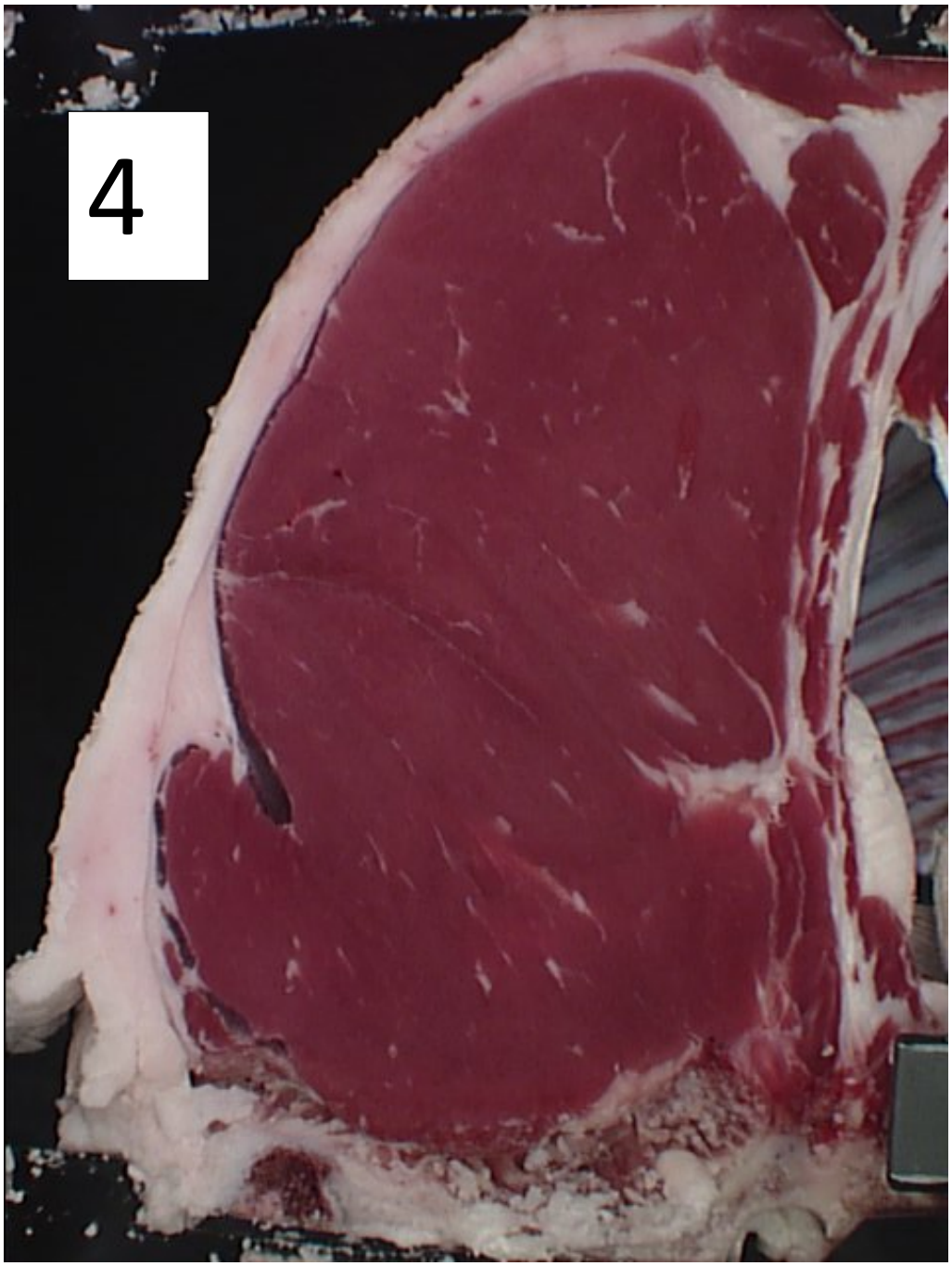

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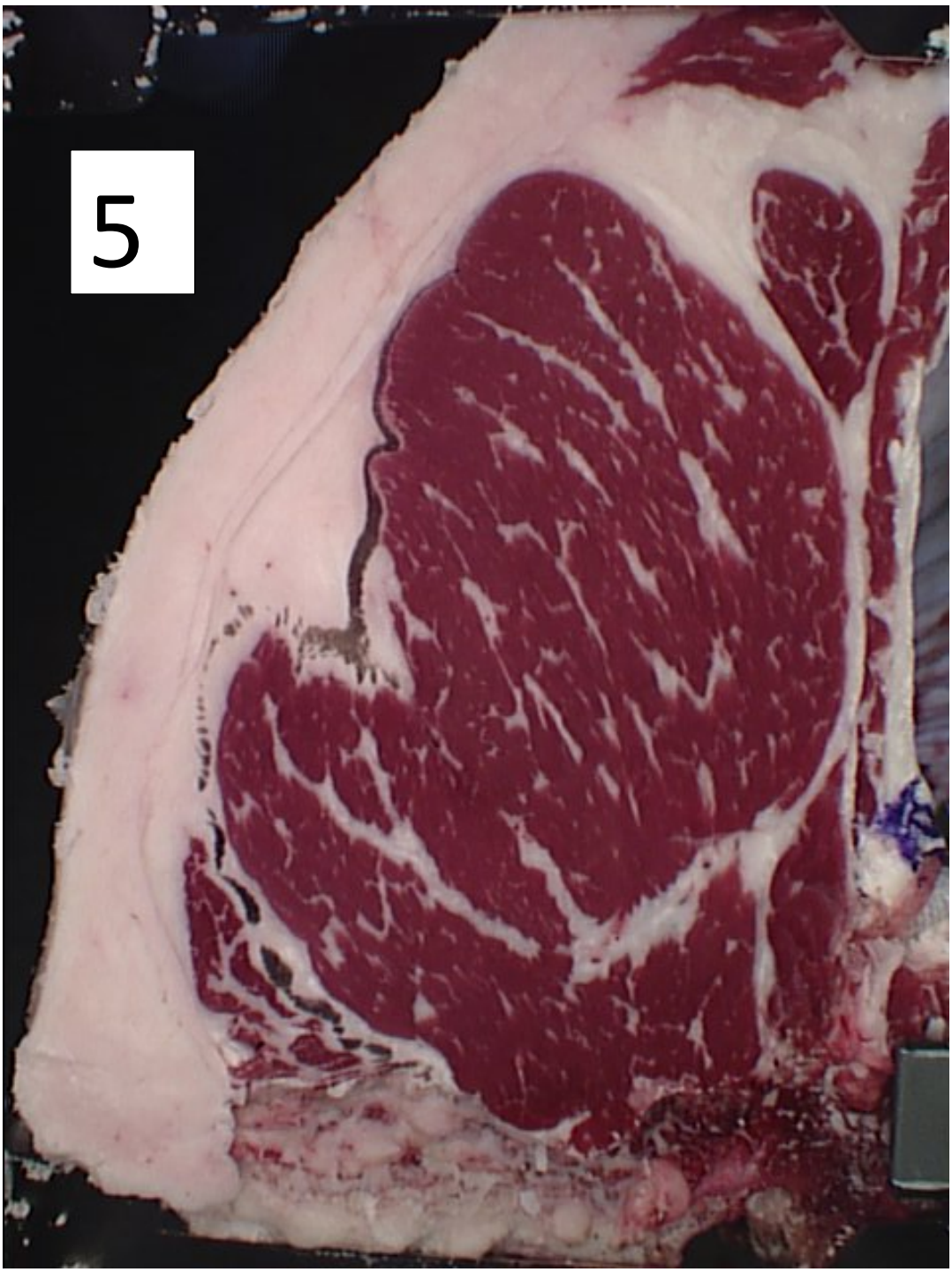

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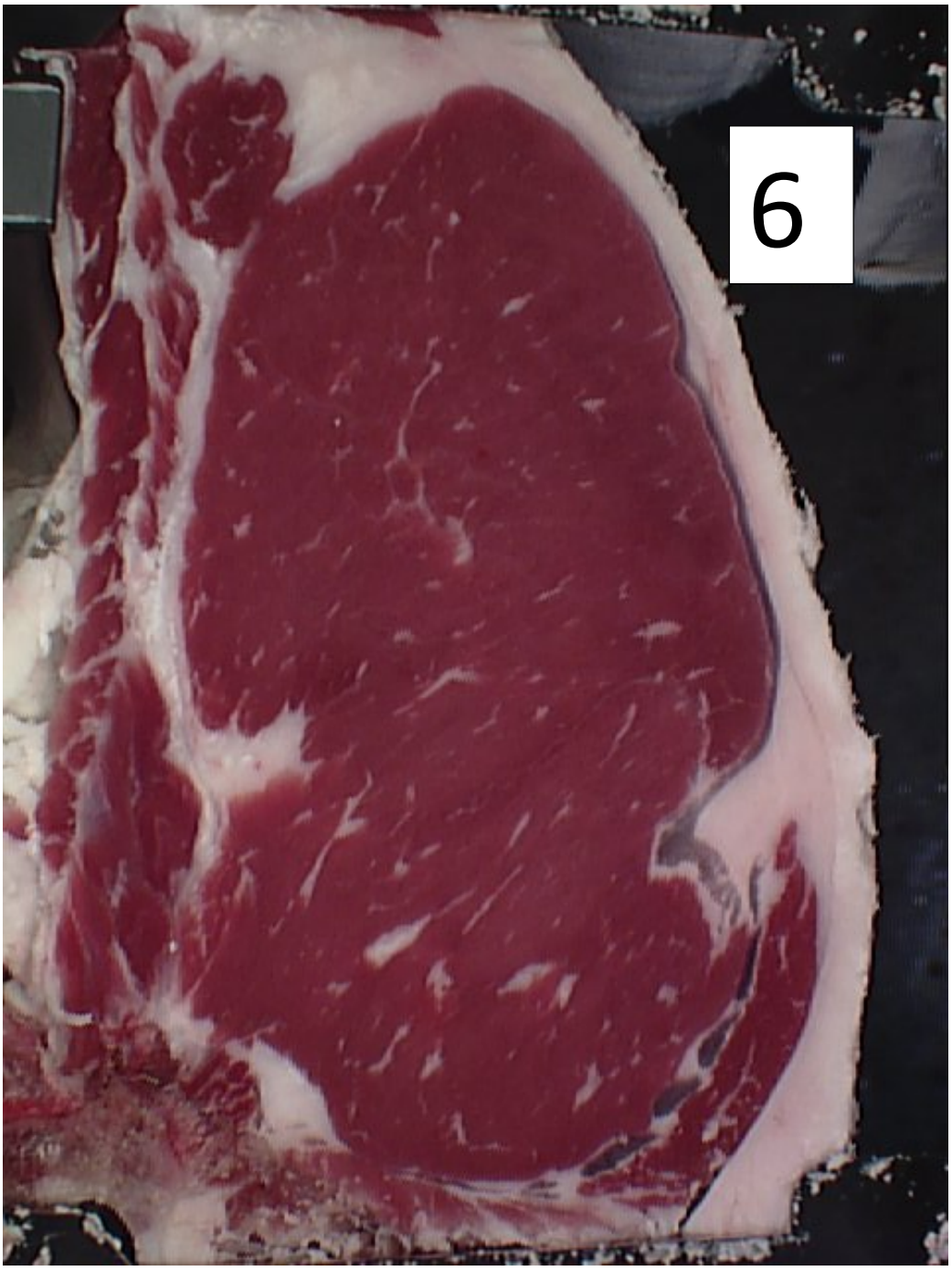

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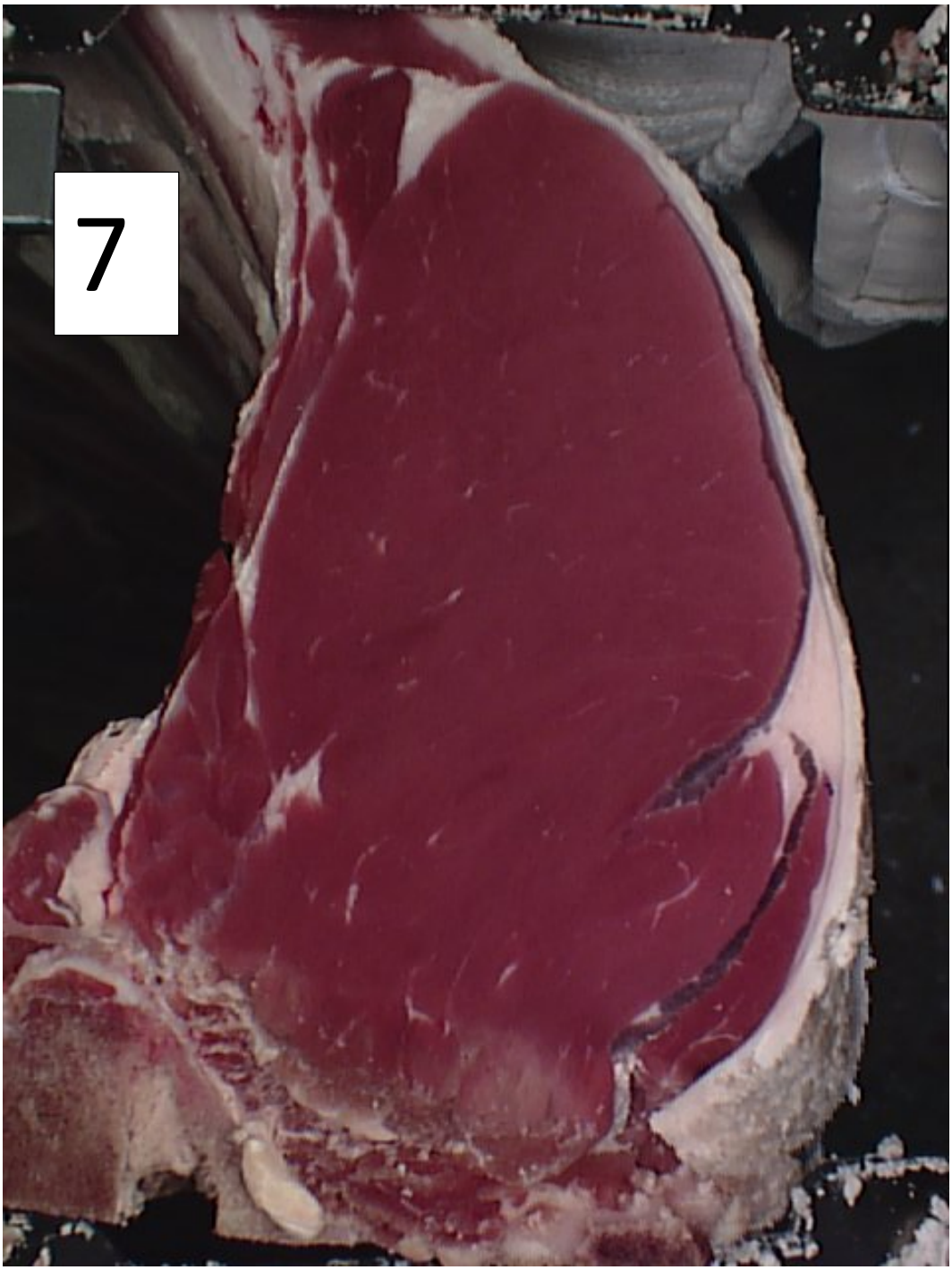

QUALITY ASSURANCE: IDEAL MARKET ANIMAL – BEEF RIBEYE PHOTOS
Photo Credit: Cindy A. Kinder


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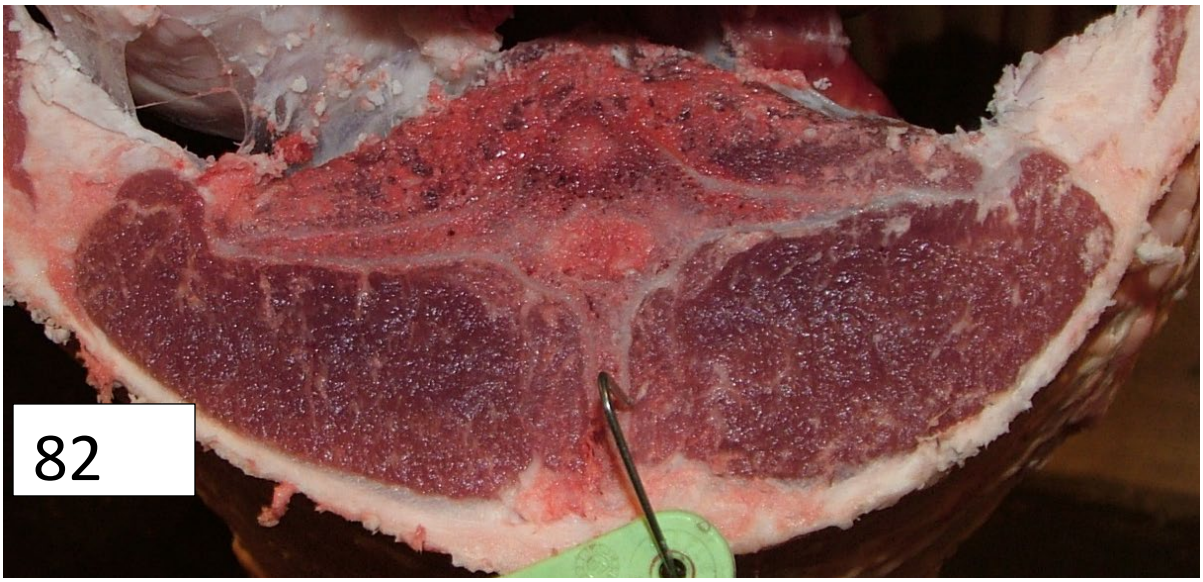
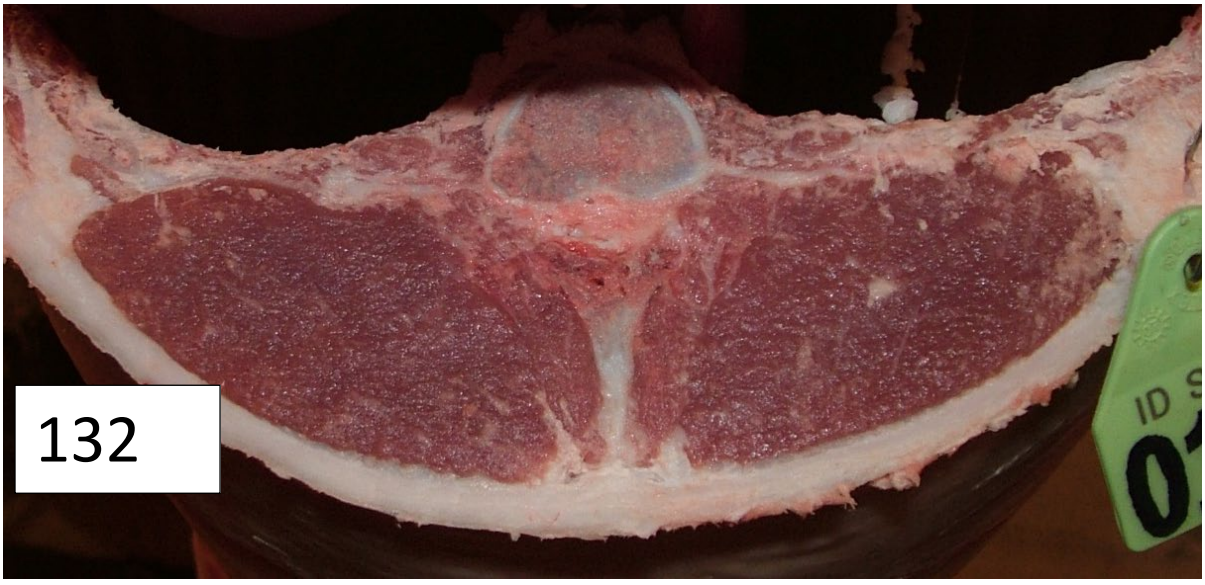
122


1509

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



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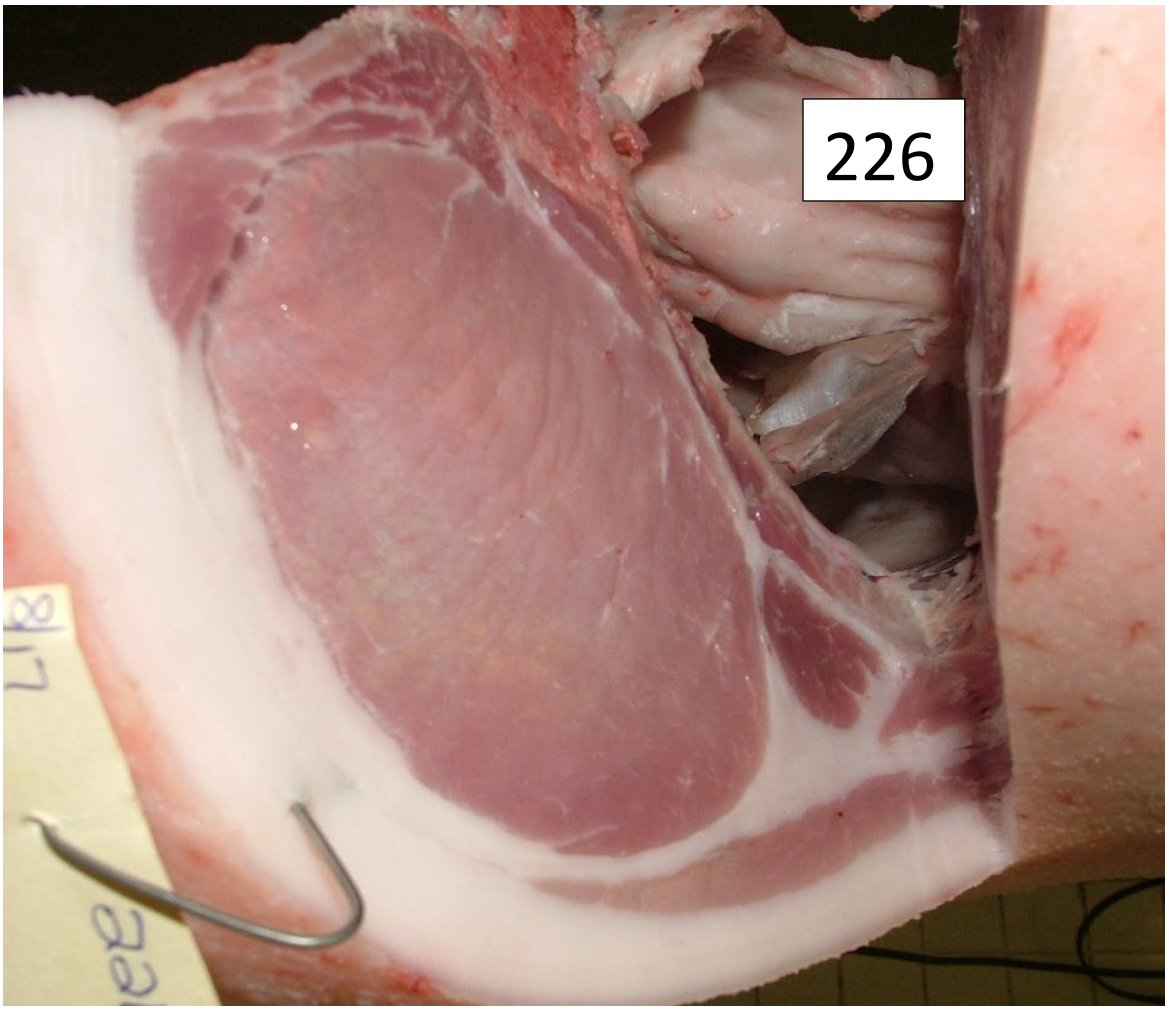
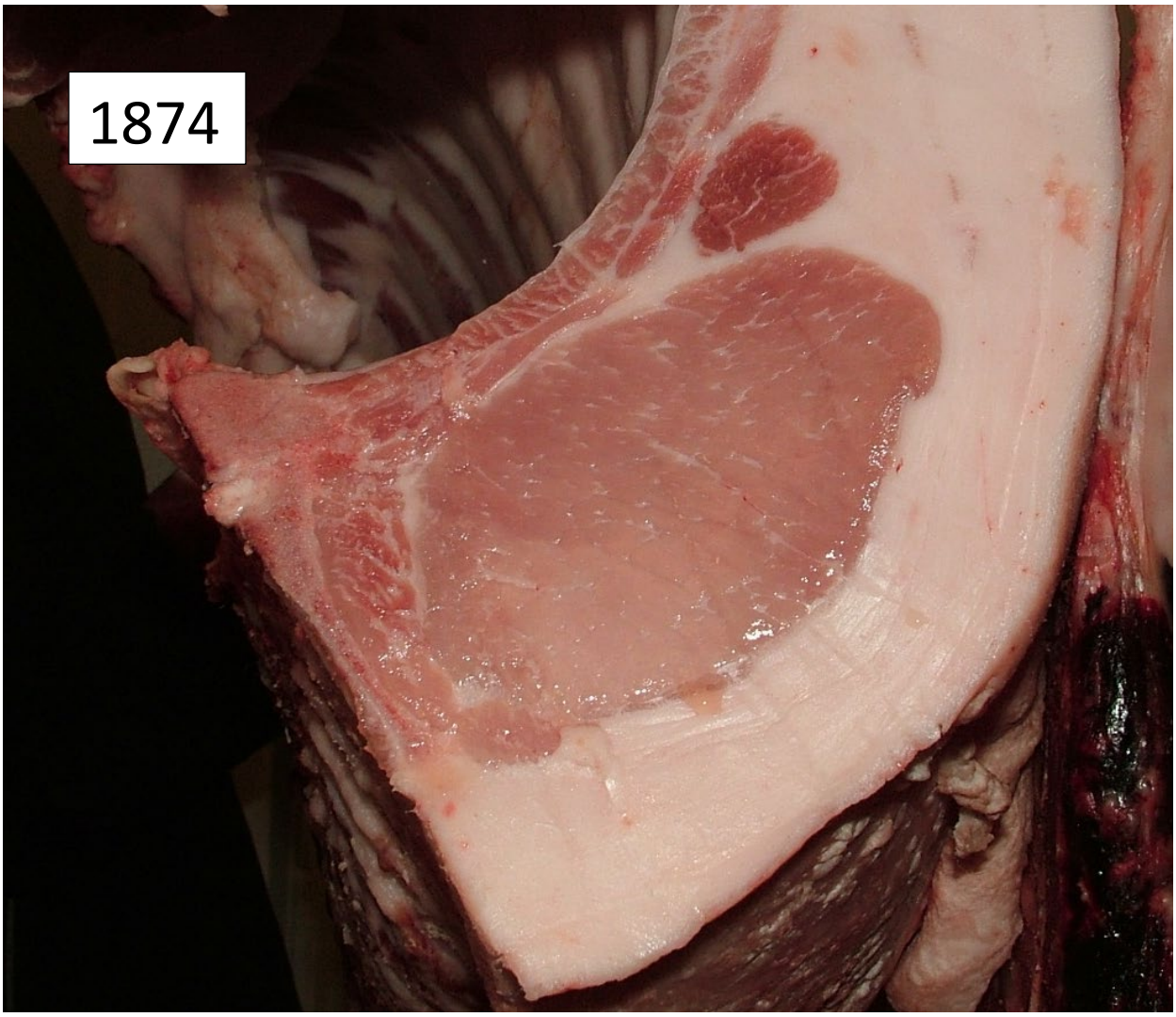
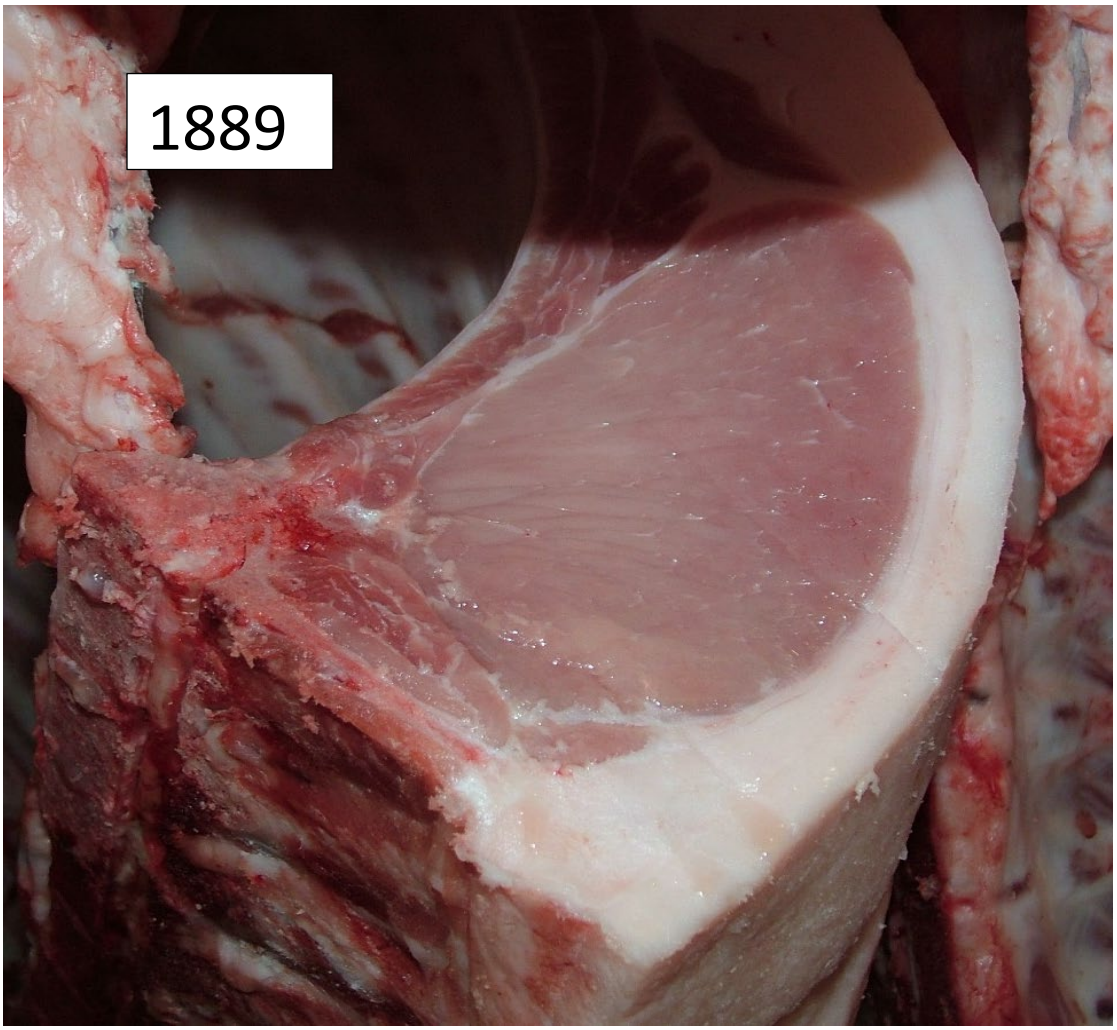
2727

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




1874


1889


1427

Quality and Yield Grade Lesson Answer Key

Marbling Score Photo Key

1 – Moderate = Choice + (High Choice)
2 – Moderately Abundant = Prime 0 (Average Prime)
3 – Modest = Choice 0 (Average Choice)
4 – Slight = Select + (High Select)
5 – Slightly Abundant = Prime – (Low Prime)
6 – Small = Choice – (Low Choice)
7 – Traces = Standard

Marbling Score Photo Rank (Highest to Lowest)

2 – Moderately Abundant
5 – Slightly Abundant
1 – Moderate
3 – Modest
6 – Small
4 – Slight
7 – Traces

Beef Potential Yield grade ranking

1st – Picture #132 had a live weight of 1305 pounds. Has the most ribeye area (13.4) compared to live weight with an acceptable fat thickness (.35).
2nd – Picture #68 had a live weight of 1100 pounds. He has a little less ribeye (10.5) than he should but he has the least amount of fat (.20) compared to the other two steers.
3rd – Picture #1509 had a live weight of 1200 pounds. He has enough ribeye (12.6) and does have more fat than needed (.55) but has less fat and more muscle than the last steer.
4th – Picture #122 had a live weight of 1400 pounds. He has less ribeye than he needs (11.0) and the most fat at .60.

Lamb Potential Yield grade ranking

1st – Picture #2727 had a live weight of 137 pounds. Has the most ribeye (3.80) with an adequate amount of fat thickness (.20).
2nd – Picture #82 had a live weight of 127 pounds. Has a little less ribeye (3.00) than #132 with less fat at .15 inches of fat thickness. Ideally this lamb could have more fat but compared to the other two sheep it will have a better yield grade.
3rd – Picture #132 had a live weight of 126 pounds. Ranks second in the amount of ribeye (3.20) and has the most fat thickness (.25).
4th – Picture #90 had a live weight of 128 pounds. Ranks last in the amount of ribeye (2.80) and is not enough for the live weight and still has as much fat as other sheep (.25).

Swine Potential USDA Grade ranking

1st – Picture 1427 had a live weight of 290 pounds. Has the most loin eye area (10.80) with the least fat thickness (.50) but the amount is adequate for the weight.

2nd – Picture #226 had a live weight of 275. Has the second most loin eye area (8.40) with a 1.15 fat thickness which is not too much for the weigh and amount of muscle.

3rd – Picture #1889 had a live weight of 265. Has the third most loin eye (6.0) with a .55 fat thickness. The fat thickness in lower than #226 but the amount of muscle compared to weight is not adequate.

4th – Picture #1874 had a live weight of 265. Has more loin eye (6.2) than #1889 and has the second most fat thickness (1.10) inches. That is too much when compared to the weight and measurements of #1889.