Meats Evaluation and Technology

Objectives

The objectives of the Tennessee FFA Meats Evaluation and Technology Career Development Event are to:

- Develop employment skills for students who are interested in exploring or pursuing career opportunities in the meat animal industry.

- Assist the local agricultural education instructor in motivating students to become knowledgeable consumers of meat animal products and/or involved in the industry of meat animal marketing and merchandising.

- Develop high school students' analytical skills, critical thinking strategies and understanding of appropriate meat terminology.

- Develop high school students' abilities to evaluate meat animal products in order to optimize economic returns to producers and industry as well as to meet the needs of the consumer.

Develop cooperation and communication skills in high school students.

Event Rules

- *Each team will be comprised of four members. All scores will be used to determine the total team score.*
- *This is an open state contest and it is open to any chapter in Tennessee FFA.*
- All participants are expected to be prompt at their stations throughout the event; no provision will be made for tardiness and will cause late participants to lose event points.
- No conversation will be allowed between participants after the individual activities begin. Conversation among participants constitutes disqualification.
- Participants and official judges are to make their placing and identifications without handling the exhibit.
- Two-minute stand back time on placing classes will be utilized when applicable.
- Official dress is not required for this event.

Event Format

The event is comprised of the following activities:

- Individual activities consist of written exam, retail meat cuts identification, beef quality and yield grading, evaluation classes and ten questions (from two of the evaluation classes).

- Team activities consists of either value-based pricing, anatomy, or keep/cull.

EQUIPMENT
- Pencils
- Clean clipboard
- Electronic and non-programmable calculator
- Participants must not bring any blank paper, notes, USDA Beef Grading worksheets, any electronic communication items, purses or backpacks.

INDIVIDUAL ACTIVITIES

Beef Quality and Yield Grading

Participants will quality grade and yield grade pictures of two to four beef carcasses (20 points/carcass).

- 40 points (two carcasses)
- 60 points (three carcasses)
- 80 points (four carcasses)

- **Quality Grading:** Participants may use the worksheet provided for Beef Grading. The participant should complete the section of answers for quality grading on the computerized scorecard. Ten points are awarded for each correct grade. Each will be scored for the applicable adjacent grade as follows: 10, 8, 5, 0. However, in the case of "B" Maturity, Select High and Select Low will be awarded zero points.

- **Yield Grading:** Participants may use the worksheet provided for Beef Grading. Participants are to calculate the final yield grade (FYG) to the nearest one-tenth of a grade. Pictures will be provided on a screen. Ten points are awarded for each correct grade. The participant should complete the section of answers for yield grading on the computerized scorecard.

Full points will be earned for every tenth (0.10) above or below the official yield grade.

A two-point deduction will be made for 2/10ths to 5/10ths (0.2 to 0.5) above or below the official yield grade.

A five-point deduction will be made for 6/10ths to 9/10ths (0.6 to 0.9) above or below the official yield grade.

Zero points will be awarded for answers one yield grade above or below the official yield grade.

Official United States Department of Agriculture Yield Grades are 1.0 to 5.9.

> **SCORING EXAMPLE**
>
> Official Yield Grade (FYG Official) = 2.2
> FYG 2.1–2.3 = full points (10)
> FYG 1.7–2.0 or 2.4–2.7 = minus 2 points
> FYG 1.3–1.6 or 2.8–3.1 = minus 5 points
> Zero points for any FYG a full yield grade above or below official FYG.
> Reference: USDA Beef Grading Worksheet; US Standards for Grades of Carcass Beef: copy and paste url into your search bar,
> https://www.ams.usda.gov/sites/default/files/media/CarcassBeefStandard.pdf

Evaluation Classes (200–400 points)

1. Four to eight evaluation classes of placing, keep/cull and/or value-based pricing. Class exhibits and formats will be as follows:
- Carcasses (beef or pork).

    Reference: National Pork Board Backfat Recommendation.

- Wholesale/subprimal cuts (beef, pork, lamb).
- Retail cuts (beef, pork, lamb).
- Processed meats (cured/smoked center ham slices, sliced bacon, smoked sausage/frankfurter, smoked chops (2021)).

    Reference: Processed Meat Class Guidelines

Keep/Cull Class (50 points/class)

Participants will be provided with a scenario that is an industry standard or situation. Participants will be given time to review the scenario and then time to evaluate the meat product and make a selection based on the provided information.

Reference: Keep/Cull Class Example

Value-Based Pricing (50 points/class)

Participants will place four exhibits (carcasses, wholesale cuts or subprimal cuts) based upon value (per hundred weight) derived from the pricing structure provided on the pricing sheet. The prices will reflect current market values. Pricing sheet will be provided to each participant.

Reference: Beef Value-Based Pricing Class Example

Question Classes (50 points)

Two of the evaluation classes will be selected for questions. A total of ten questions will be asked covering both classes; typically, there are five questions per class, but it could vary if needed to make the best possible questions. Participants will be given a short time period to study their notes before answering questions after they have observed and placed the classes. Participants will not be able to use their notes when answering questions. Questions will be worth five points each.

GUIDELINES FOR QUESTIONS:

- All questions must be written in a manner that they can be answered by only one of the following responses:
  1, 2, 3, 4.
- Questions should pertain to the criteria and differences used in placing the class (trimness, muscling, quality and/or sex). Questions that do not relate to the placing of the class or are not significant to the overall evaluation are not desirable questions and should not be used if possible.
- When asking questions about the differences within a class, the differences must be visually distinguishable.

Reference: Individual Examples, Evaluation Class Questions

Retail Meat Cuts Identification (210 points)

Participants will identify 30 retail meats cuts found on the Meats Identification Card. The official key (Retail Cuts Code Sheet) is located near the end of this handbook. Only the cuts listed are eligible to be used in this event. Participants will be given one point for correct species identification, two points for correct primal cut identification, one point for correct cookery and three points for correct retail name. Answers will be recorded on a computerized scan form/sheet.

Reference: Retail Cuts Code Sheet with Cookery

CLARIFICATION OF TERMS FOR RETAIL IDENTIFICATION

Chop: Smaller, flat cuts of meat, usually from the pork, veal or lamb rib, loin or shoulder, generally ranging from 1/2 inch to 1 1/2 inches in thickness. A chop usually is sized to be a single meal portion.

Slice: A section of meat, usually less than one-inch thick, taken from the center or either

side of center of the leg of pork, lamb or veal.

Steak: A flat cut of meat, larger than a chop, ranging from 3/4 inch to 1 1/2 inches of thickness cut from various parts of a beef carcass or the shoulder of pork and veal. The size of a steak is often sufficient to provide more than one portion.

Roast (Meat Cut): Cuts of meat larger than steaks, chops or slices (usually two or more inches thick). This cut is intended to serve more than two people.

Written Exam (100 points)

Each participant will be given a 50-question written exam relating to meat storage and handling, cookery, nutrition, food safety (HACCP principles, bio-security and personal safety), processed meats, legislation and history, purchasing meat, and animal care and handling. Questions could include multiple choice, true/false or situation-based questions. Value per question will be based on question type. The last five years of National FFA Meats evaluation exams will be used for the test bank. 2018, 2019, 2021, 2022, 2023.

Reference: Individual Examples, Written Test
See references for written exam resource material.

TEAM ACTIVITIES

Each team will be required to complete one problem from the list provided below. The event will be scored for a total of 50 points.

The committee will have the latitude to select the most appropriate activities each year depending on the product available.

- Utilizing product, photos or diagrams, participants will be asked to identify the following from selected locations on the exhibit.
    - Major muscle groups
    - Major bones

    Reference: Team Activities, Example #1

- Utilizing retail identification cuts, the participants will work as a team to appraise a class of retail cuts.
- Completion of a beef value-based pricing scenario.

Scoring

The event will be divided in the following sections and scored as follows:

Activity	Individual Points	Team Points
Written exam	100	400
Retail meat cuts identification (30 cuts)	210	840
Beef quality and yield grading (2 to 4 carcasses)	40–80	160-320
Evaluation of 4 to 8 classes	200–400	800-1600
Ten questions (from two of the evaluation classes)	50	200
Team Activity (1 practicums@50 points		50
TOTAL MAXIMUM POINTS POSSIBLE	600-840	2450-3410

TIEBREAKERS

If ties occur, the following sections of the event, in this order, will be used to determine award recipients:

Individual
1. Identification retail meat cuts.
2. Grading.
3. Class questions.

Team
1. Team activity score.
2. Retail Identification total of the team.
3. Grading total of the team.
4. Class questions total of the team.

Awards

Awards will be presented to individuals and teams at the awards ceremony based on their rankings. Advisors of cash award recipients will receive information about claiming their award following the convention. Guidelines for amounts and recipients of cash awards can be found here. Corporate partners help grow the next generation of leaders through supporting AFNR pathways awards.

References

This list of references is not intended to be all-inclusive. Other sources may be utilized, and teachers are encouraged to make use of the very best instructional materials available. The following list contains references that may prove helpful during event preparation.

- National FFA CDE Q&A's, FFA.org

- North American Meat Institute, https://www.meatbuyersguide.com

  - Meat Buyer's Guide
  - NAMP Meat Posters
  - Beef, Lamb, Pork and Veal Cut Charts

- CEV Multimedia, 1020 SE Loop 289, Lubbock, Texas 79404, (800) 922-9965, https://www.icevonline.com/curriculum

  - Retail Cuts Identification (DVD)
  - Meat Science and Food Safety (DVD) — written exam resource, updated June 2019, slide 3 will indicate the slides that were updated.

- Beef Myology, http://bovine.unl.edu

- National Cattlemen's Beef Association, 9110 E. Nichols Ave. #300, Centennial, Colo. 80112, (303) 694-0305/1-800-368-3138

  - USDA Marbling Photographs
  - Guide to Identifying Meat Cuts, https://store.beef.org/

- American Meat Science Association (AMSA), 2441 Village Green Place, Champaign, Illinois 61874, (800) 517-2672, http://www.meatscience.org/students/meat-judging-program

  - Email: information@meatscience.org
  - USDA Marbling Photographs
  - Meat Evaluation Handbook

- Art Services, Inc., 3015 Earl Place, N.E., Washington, D.C., 20018, (202) 526-5607

  - Beef Ribeye Grids

- NASCO, 901 Janesville Avenue, P.O. Box 901, Fort Atkinson, Wis. 53538-0901, 1-800-558-9595

  - Preliminary Yield Grade Rulers (https://www.enasco.com/p/USDA-Preliminary-Cutability-Grade-Ruler%2BC02615N)
  - Beef and Pork Ribeye Grids

- Example Meats Evaluation Websites of Classes and Materials

  - http://aggiemeat.tamu.edu/meat-identification-pictures
  - https://www1.unl.edu/search/?q=meat+identification+pictures&u=https%3A%2F%2Fanimalscience.unl.edu%2F

- USDA Carcass Beef Grades and Standards, copy and paste url into your search bar, https://www.ams.usda.gov/sites/default/files/media/CarcassBeefStandard.pdf

  - Announcement of Changes to the U.S. Beef Grade Standards, https://www.ams.usda.gov/content/usda-announces-changes-us-beef-grade-standards

NATIONAL PORK BOARD BACKFAT RECOMMENDATION

NOTE: Policy Statement — Backfat Recommendations for Placing Unribbed Pork Carcass Classes — The National Pork Board has published live and carcass specifications for the "ideal" market hog, known as Symbol III (National Pork Board, 2005).

Pork carcasses with less than 0.60 inches of backfat have a higher incidence of bellies that are too thin for high-quality bacon production and also tend to have unacceptably low marbling levels and less palatable pork. If this situation is presented in competition, students would be expected to evaluate the given carcass or carcasses against contemporaries within the class and rank accordingly.

PROCESSED MEAT CLASS GUIDELINES

Specifications for Evaluating Slice Bacon

DESCRIPTION:

The term "bacon" is used to describe the cured belly of a swine carcass. Sliced bacon describes slices of cured pork belly that are normally found in 12-ounce or larger vacuum wrapped packages in retail stores. The product entry should be judged as an entire package, and the bacon slices should be uniform in length and shape. Firm, dry (but not overly dry) slices are desirable, while wet, oily slices are not desirable. The presence of purge or exudate (water in the package or excess on the product's surface) suggests that the bacon slices were generated from a lower quality belly.

EVALUATION:

Sliced bacon should be evaluated by the following criteria:
- **Fat-to-lean ratio:** The ideal fat-to-lean ratio of sliced bacon is approximately 50 to 55 percent lean and 45 to 50 percent fat. This is determined by averaging the fat vs. lean of several slices.
- **Lean and fat color:** The color of the lean portion of the bacon slices should be a desirable reddish-pink, cured color. The color should also be uniform among all muscles within each bacon slice, as well as among all the bacon slices. A bright white fat is also desirable.
- **Physical defects:** Any signs of visual oiliness/greasiness should downgrade the bacon slices exhibit. Also, lean/fat separation, tiger-striping (light colored vertical stripes observed perpendicular to the direction of the lean and fat) and shattering/cracking of fat is also considered a defect. Finally, bacon slices should be uniform in conformation. Rectangular shaped slices devoid of "V" or valley-shaped regions are non-desirable.

Specifications for Evaluating Frankfurters/Smoked Sausage

DESCRIPTION:

Frankfurters (Coarse Ground & Emulsified) and Small-Diameter Smoked and Cooked Sausages are generally smoked, and the external appearance should be a golden-mahogany color.

The product entry should be judged as a whole, and links should be consistent in length and diameter. For natural and collagen casing products, the ends should not be excessively trimmed and/or there should not be excessive casing twists at the ends of the sausage. Smoke streaks and spots should be downgraded. The internal appearance is evaluated by cutting a link in half lengthwise to expose the interior of the sausage. Internal attributes should include a deep reddish-pink, cured color with uniform particle size and ingredient distribution.

EVALUATION:

Frankfurters and Small-Diameter Smoked and Cooked Sausages should be evaluated by the following criteria:

- **External appearance:** The external appearance should be desirable. A golden-mahogany color should exist. The color should be uniform throughout each of the links. The links should be very uniform in shape and size (including diameter). If spices (such as a black pepper) or non-meat ingredients (e.g., cheese) are present on the surface, they should be uniformly dispersed throughout. Any noticeable defects (e.g. greasiness, pinholes, wrinkles, touch-marks, etc.) should downgrade the exhibit.
- **Internal appearance:** The internal appearance should be desirable. For beef and/or pork sausages, a deep reddish-pink cured color should exist. For poultry sausages, a light reddish-pink color is desired. The texture of the sausage should not be too dry or too wet. Too much connective tissue should be downgrade the exhibit. The lean and fat particle size should be uniform throughout the sausage. If spices/non-meat ingredients are visually present, they should be uniform in size and uniformly distributed throughout the sausage. Any air pockets, voids, unidentified objects (such as hard cartilage or bone) should downgrade the exhibit.

Specifications for Evaluating Center-Cut Ham Slices

DESCRIPTION:

Bone-in, center-cut ham slices are removed from the center section of bone-in hams. The cured and smoked center ham slice should be free of skin, bruises, blood clots and lymph glands. Ham slices should be approximately round and exhibit a cured and smoked appearance. The lean meat should possess a fine, smooth texture with a uniform and bright reddish-pink color (a slightly two-toned or iridescent color is permissible). Excessive under- or over-trimming of the ham slice for any reason is not desirable.

EVALUATION:

Bone-in, center-cut ham slices should be evaluated by the following criteria:

- **Cutability:** Ham slices with a great area of exposed lean, little external/internal fat and a small amount of bone are desirable. For a smoked, cured ham, the center slice should display acceptable muscling as evaluated by the depth and width of the cushion and forecushion areas. Subcutaneous fat and intermuscular fat ("fat pockets") should not be excessive. No more than 1/8 inch of subcutaneous fat should be present. The size of the bone should be included in the evaluation, as a larger bone is less desirable.
- **Color:** A uniform dark reddish-pink cured color should be observed on all muscle surfaces. This cured color should be uniform throughout the entire ham slice with as little color variation between muscles as possible.
- **Physical defects:** "Blood splashing" (specks or spots of blood), uncured spots, "two-toning" or "greening" should not be present on the exposed cut surface. The texture of the exposed cut surface should be smooth and fine. Coarse texture may be the result of using meat of carcasses from mature animals or from inadequate cooking. The cut surface should be firm and non-exudative with no separation of muscle groups. The pickle pocket should be as small as possible with the least amount of sinewy appearance.

Specifications for Evaluating Smoked Chops

DESCRIPTION:

Bone-in, smoked pork chops could consist of loin chops or rib chops. The cured and smoked chops should be free of bruises or blood spots. Chops should exhibit a cured and smoked appearance. The lean meat should possess a fine, smooth texture with a uniform and bright, reddish-pink color. Excessive under-trimming or over-trimming of the chop for any reason is not desirable.

EVALUATION:

Bone-in, smoked pork chops should be evaluated by the following criteria:

- **Cutability:** Chops with a great area of exposed lean, little external fat, and a small amount of bone are desirable. For a smoked, cured chop, the chop should display acceptable muscling as evaluated by the size of the loin eye and tenderloin muscles. Subcutaneous/intramuscular fat should not be excessive. The size of the bone should be included in the evaluation, as a larger bone is less desirable.

- **Color:** A uniform dark, reddish-pink cured color should be observed on all muscle surfaces. This cured color should be uniform throughout the entire chop with as little color variation as possible.

- **Physical defects:** "Blood splashing" (specks or spots of blood), uncured spots, "two-toning," or "greening" should not be present on the exposed cut surface. The texture of the exposed cut surface should be smooth and fine. Coarse texture may be the result of using meat of carcasses from mature animals or from inadequate cooking. The cut surface should be firm and non-exudative.

Team Activity Examples

* If marked with an asterisk(*), activity may be a Team or an Individual Activity.

ANATOMY EXAMPLE #1 (50 POINTS)

Utilizing a carcass, primal or subprimal exhibit, participants will be asked to identify the following from selected locations on the exhibit: Note: Example muscle groups and major bones are not inclusive of all muscle groups or bones that may be used in the event.

Major muscle groups:
- Longissimus dorsi
- Infraspinatus
- Spinalis dorsi
- Psoas major
- Luteus medius
- Biceps femoris
- Semitendinosus
- Semimembranosus

Major bones:
- Scapula
- Humerus
- Femur
- Thoracic vertebrae
- Lumbar vertebrae

Example Scenario:

Specific areas on one or more carcasses or wholesale/subprimal cuts or retail cuts will be identified. Based on the identified areas, participants will confer with team members to answer the following items.

1. Find the area on the carcass marked "A." Which of the following muscles can be found within this area of the carcass?

   a) Biceps femoris
   b) Longissimus dorsi
   c) Semimembranosus
   d) Semitendinosus

2. On the porterhouse steak at station #1, name the muscle identified by the tag "A":

   a) Spinalis dorsi
   b) Gluteus medius
   c) Semitendinosus
   d) Psoas major

3. On the chuck roast at station #2, name the bone specified by tag "B":

   a) Femur
   b) Lumbar vertebrae
   c) Scapula
   d) Humerus

RETAIL CUTS EXAMPLE #2 (50 POINTS)

Utilizing the retail identification cuts provided, the participants will work as a team to solve a meats problem. A scenario will be provided which will allow participants to apply meats concepts from present cuts.

Example of possible questions: 2–10 questions

The retail identification cuts utilized in the event represent the product you have available in your present meats operation. With this in mind, communicate with your teammates to fill the following orders:

The organizer of a family reunion is planning the annual event. The family wants a low-cost beef cut that can be cooked, shredded and smothered in BBQ sauce. Which cut is most appropriate?

   a) Retail Cut #9
   b) Retail Cut #12
   c) Retail Cut #23
   d) Retail Cut #29

KEEP/CULL EXAMPLE #3 (50 POINTS) *

Utilizing the keep/cull class(es), the participants will work as a team to appraise a class of subprimal or retail cuts. A scenario will be provided that will allow participants to make conclusions. Team members will identify the four exhibits to keep and mark them appropriately on a computerized scorecard form to fit the scenario given to them by the officials.

Example Scenario:

As a consumer, you arrive at a supermarket meat counter with the objective of selecting ribeye steaks for a social gathering being hosted at your house. The guests include your immediate supervisor from work and her husband. Consequently, you wish to select the steaks that are the juiciest, most flavorful and most tender.

Select the four ribeye steaks to be served to your guests.

Scoring: Four meat products to be kept will have an aggregate score of 50 points.

Correct Selection	*					*	*	*
Exhibit Item	1	2	3	4	5	6	7	8
POINTS POSSIBLE	12	8	5	5	4	18	11	9

*The four correct selections will add up to 50 points. The culled items will have a lesser value than the fourth-place item kept.

Beef Value-Based Pricing Example #4 (50 points) *

Example Scenario:

As a team you will review a Grid Pricing Sheet given by the officials. Team members are to evaluate, communicate and reach a conclusion on the correct placing of the class based on the value of the carcasses or wholesale/primal cuts.

Participants will place four exhibits (carcasses or wholesale cuts) or keep/cull (scenario will be provided) based upon value (per hundred weight (cwt)) derived from the pricing structure provided on the pricing sheet. The prices will reflect current market values. Pricing sheet will be provided to each participant.

Carcasses exhibiting dairy type are ineligible for Yield Grade 1 or 2 premiums. Carcasses classified as Hardbone will exhibit C, D or E skeletal maturity and should be yield graded only. Carcasses with blood splash or Dark Cutter are ineligible for quality grading and should be yield graded only. A bruise is classified as an area located on the carcass where excess trimming has been performed and a major portion of the major muscle groups in the chuck, rib, loin or round has been removed.

A SAMPLE BEEF CARCASS PRICING SHEET (TRAINING AID)

Values in parentheses are discounts and should be subtracted from the Carcass Base Price, which is established based on the exhibits USDA Quality and Yield Grade. Prices on the Grid Pricing Sheet may change from year to year.

Example Class

Carcass #1: Carcass Weight = 758 pounds

Quality Grade = Choice –

Yield Grade = 2.5

Base Value = $125.00

No Discounts

Carcass Value = $125.00

Carcass #2: Carcass Weight = 976 pounds

Quality Grade = Choice +/o

Yield Grade = 3.9

Base Value = $127.00

Weight Discounts = minus $4.00

Carcass Value = $123.00

Carcass #3: Carcass Weight = 758 pounds

Quality Grade = Choice +/o

Yield Grade = 3.2

Base Value = $127.00

Dairy Discounts = minus $5.00

Carcass Value = 122.00

Carcass #4: Carcass Weight = 843 pounds

Quality Grade = Ineligible due to being a Dark Cutter

Yield Grade = 3.5

Base Value = $92.00

Bruise on Left Side Loins extending into the Longissimus dorsi muscle =   minus $10.00

Carcass Value = $82.00

PRICING SHEET EXAMPLE

Prices based on the USDA Beef Carcass Price Equivalent Index and the USDA National Carcass Premiums and Discounts

Base Price ($/cwt.)

	Prime	Choice +/o	Choice -	Select	Standard	Hardbone	Dark Cutter/ Blood splash
YG 1	$136	$130	$126	$119	$110	$96	$92
YG 2	$134	$128	$125	$117	$108	$96	$92
YG 3	$133	$127	$123	$116	$107	$96	$92
YG 4	$121	$115	$112	$104	$95	$84	$81
YG 5	$113	$108	$104	$97	$87	$77	$73

Discounts ($/cwt.)

Carcass			
<500	($27)	Dairy Type *	($5)
00 to 549	($16)	Bruise	($10) per side **
550 to 599	($4)		
900 to 949	($2)		
950 to 999	($4)		
1000 and up	($19)		

Notes:

- **Carcasses exhibiting dairy type are ineligible for YG1 and YG2 premiums.*

- ***Maximum discount of $20 per carcass for bruising.*

Final Placing: 1 – 2 – 3 – 4

MEAT FORMULATION PROBLEM SOLVING EXAMPLE #5 (50 POINTS)

Participants will be given a situational problem involving the least-cost formulation of a batch of particular meat products (hamburger, wiener, bologna, etc.). This problem will be worth 50 points and consist of procedural questions and the actual determination of the least-cost price.

- **Freezing:** Freezing of red meat is considered 28 degrees F and below.

- **Freshness:** Start counting from the date of processing (zero hour) back toward slaughter date. For example, processing on Oct. 26 with a 72-hour freshness specification means Oct. 25, 24 and 23 are good dates; Oct. 22 or earlier are unacceptable dates.

USDA Food Standards and Labeling Policy for Ground Beef:

- May not contain added fat.

- Maximum total fat 30 percent.

- Cheek meat is permitted up to 25 percent and must be declared in the ingredients statement. For more than 25 percent, show as "Ground Beef and Cheek Meat," all the same size. Beef of skeletal origin or from the diaphragm or esophagus (weasand) may be used in the preparation of chopped beef, ground beef or hamburger. Heart meat and tongue meat as organ meats are not acceptable ingredients in chopped beef, ground beef or hamburger.

Specifications on ground beef for this activity:

- No variety meats may be used.

- No product more than five days old may be used.

- All fresh products must be stored at a temperature not to exceed 34 degrees F.

- Least-cost determination should be performed on acceptable ingredients to select the lowest-cost product that meets all ground beef guidelines.

You have received an order with the following specifications:

- Desired fat content of finished product = 20%.

- Batch size = 5,000 lbs.

- Manufacture date = Wednesday, Oct. 20, 2016.

Available Ingredients

Product	Slaughter Date	Temp. °F	% Fat Content	$ Price/lb.
Beef Heart	October 15	33°	4	.41
80% Trimmings	October 16	35°	20	1.40
75% Trimmings	October 17	34°	25	1.28
Beef Flank	October 14	33°	2	.91
Chuck Tender	October 17	33°	16	1.58
Pork Trimmings	October 18	34°	15	.86
Ribeye Roll	October 18	34°	12	2.12
Bull Product	October 16	34°	8	1.74

Instructions: Carefully read each item and possible answers. Mark the correct answer on the appropriate form.

Solution: Which of the following was the correct formulation for this problem?

1. 75% Trimmings and Beef Heart
2. 75% Trimming and Bull Product
3. 75% Trimming and Chuck Tender
4. 75% Trimming and Ribeye Roll
5. 80% Trimmings and Beef Heart
6. 80% Trimmings and Bull Product
7. 80% Trimmings and Chuck Tender
8. Beef Heart and Beef Flank
9. Chuck Tender and Bull Product
10. The correct solution is not listed.

1. What was the total cost of the correct final batch?
   A. $2,523
   B. $4,544
   C. $5,356
   D. $7,067
   E. $7,240

2. What was the price per pound of the correct final batch?
   A. $1.28
   B. $1.41
   C. $1.45
   D. $1.74
   E. $7.67

3. What was the percentage of lean in the correct final batch?
   A. 17%
   B. 20%
   C. 29%
   D. 71%
   E. 80%

4. What percentage of the correct final batch was Chuck Tender?
   A. 0%
   B. 16%
   C. 29%
   D. 56%
   E. 71%

5. How much Bull Product was in the correct final batch?

    A. 0 lbs.
    B. 1,450 lbs.
    C. 2,523 lbs.
    D. 3,550 lbs.
    E. 4,544 lbs.

6. Which ingredient was excluded based on temperature?

    A. 80% Trimmings
    B. Beef Flank
    C. Beef Hearts
    D. Bull Product
    E. Pork Trimmings

7. How much fat was in the correct final batch?

    A. 0 lbs.
    B. 1,000 lbs.
    C. 2,000 lbs.
    D. 4,000 lbs.
    E. 5,000 lbs.

8. What percentage of the correct final batch was from 75% Trimmings?

    A. 0%
    B. 29%
    C. 71%
    D. 75%
    E. 100%

*Correct answers— **Solution**: 2. **Questions**: 1. D, 2. B, 3. E, 4. A, 5. B, 6. A, 7. B, 8. C

CALCULATIONS FOR FORMULATION PROBLEM

Batch Size = 5,000 lbs.

	Ingredient Name	Price/lb.	Fat Content	Desired Fat%	Multiples	Proportion of Batch	Lbs. of Batch		Cost
Ingredient with most fat =	75% Trimmings	$1.28	25%	20%	4	0.44	2,200	lbs.	$2,216
Ingredient with least fat =	Chuck Tender	$1.58	16%		5	0.56	2,800	lbs.	$4,424
Sum=					9		**TOTAL COST OF BATCH =**		$7,240
							PRICE PER POUND =		$1.45

Possible questions:		Amount of fat=	1,000	lbs.					
		Amount of lean=	4,000	lbs.					
		Percentage of fat =	20	%					
		Percentage of lean =	80	%					

Batch Size = 5,000 lbs.

	Ingredient Name	Price/lb.	Fat Content	Desired Fat%	Multiples	Proportion of Batch	Lbs. of Batch		Cost
Ingredient with most fat =	75% trimmings	$1.28	25%	20%	8	0.62	3,100	lbs.	$3,968
Ingredient with least fat =	Ribeye Roll	$2.12	12%		5	0.38	1,900	lbs.	$4,028
Sum=					13		**TOTAL COST OF BATCH =**		$7,996
							PRICE PER POUND =		$1.60

Possible questions:		Amount of fat=	1,000	lbs.					
		Amount of lean=	4,000	lbs.					
		Percentage of fat =	20	%					
		Percentage of lean =	80	%					

Batch Size = 5,000 lbs.

	Ingredient Name	Price/lb.	Fat Content	Desired Fat%	Multiples	Proportion of Batch	Lbs. of Batch		Cost
Ingredient with most fat =	75% Trimmings	$1.28	25%	20%	12	0.71	3,550	lbs.	$4,544
Ingredient with least fat =	Bull product	$1.74	8%		5	0.29	1,450	lbs.	$2,523
Sum=					17		**TOTAL COST OF BATCH =**		$7,067
							PRICE PER POUND =		$1.41

Possible questions:		Amount of fat=	1,000	lbs.					
		Amount of lean=	4,000	lbs.					
		Percentage of fat =	20	%					
		Percentage of lean =	80	%					

Individual Examples

WRITTEN TEST EXAMPLES

Sample Questions:

- What is the maximum amount of fat that ground beef may contain?

    A*. 30%

    B. 10%

    C. 40%

    D. 20%

- What is the least desirable method of thawing frozen meat?

    A*. Defrosting at room temperature

    B. Defrosting in refrigerator

    C. Defrosting in a microwave

    D. Cooking from frozen state

*Correct answer

EVALUATION CLASS QUESTIONS EXAMPLES

Acceptable Questions:

- Which beef carcass had the largest ribeye?
- Which pork carcass had the least backfat opposite the last rib?
- Which ribeye steak exhibited the brightest colored lean?
- Which ham was trimmest beneath the butt face?
- Which beef rib exhibited the most marbling in the blade face?

Unacceptable Questions:

- Which pork carcass had a missing foot?
- Which beef carcass displayed indications of a bruise?
- Which ribeye steak was bigger?

Retail Cuts Code Sheet with Cookery

Species	Primal	Retail Cut	Cooking Method	Species	Primal	Retail Cut	Cooking Method
B	B	89	M	Beef	Brisket	Corned	Moist
B	B	15	M	Beef	Brisket	Flat Half, Bnls	Moist
B	B	10	M	Beef	Brisket	Whole, Bnls	Moist
B	C	26	M	Beef	Chuck	7-bone Pot-roast	Moist
B	C	03	M	Beef	Chuck	Arm Pot-Roast	Moist
B	C	04	M	Beef	Chuck	Arm Pot-Roast, Bnls	Moist
B	C	06	M	Beef	Chuck	Blade Roast	Moist
B	C	13	D/M	Beef	Chuck	Eye Roast, Bnls	Dry/Moist
B	C	45	D	Beef	Chuck	Eye steak, Bnls	Dry
B	C	20	M	Beef	Chuck	Mock Tender Roast	Moist
B	C	48	M	Beef	Chuck	Mock Tender Steak	Moist
B	C	21	D	Beef	Chuck	Petite Tender	Dry
B	C	29	D/M	Beef	Chuck	Shoulder Pot Roast (Bnls)	Dry/Moist
B	C	58	D	Beef	Chuck	Top Blade Steak (Flat Iron)	Dry
B	D	47	D/M	Beef	Flank	Flank Steak	Dry/Moist
B	F	49	D	Beef	Loin	Porter House Steak	Dry
B	F	55	D	Beef	Loin	T-bone Steak	Dry
B	F	34	D	Beef	Loin	Tenderloin Roast	Dry
B	F	56	D	Beef	Loin	Tenderloin Steak	Dry
B	F	59	D	Beef	Loin	Top Loin Steak	Dry
B	F	60	D	Beef	Loin	Top Loin Steak, Bnls	Dry
B	F	64	D	Beef	Loin	Top Sirloin Cap Steak, Bnls	Dry
B	F	63	D	Beef	Loin	Top Sirloin Steak, Bnls Cap Off	Dry
B	F	62	D	Beef	Loin	Top Sirloin Steak, Bnls	Dry
B	F	40	D	Beef	Loin	Tri Tip Roast	Dry
B	G	28	M	Beef	Plate	Short Ribs	Moist
B	G	54	D/M	Beef	Plate	Skirt steak, Bnls	D/M
B	H	22	D	Beef	Rib	Rib Roast	Dry
B	H	13	D	Beef	Rib	Ribeye Roast, Bnls	Dry
B	H	45	D	Beef	Rib	Ribeye Steak, Bnls	Dry
B	H	50	D	Beef	Rib	Ribeye Steak, Lip-On	Dry
B	I	08	D/M	Beef	Round	Bottom Round Roast	Dry/Moist
B	I	09	D/M	Beef	Round	Bottom Round Rump Roast	Dry/Moist
B	I	43	M	Beef	Round	Bottom Round Steak	Moist
B	I	14	D/M	Beef	Round	Eye Round Roast	Dry/Moist
B	I	46	D/M	Beef	Round	Eye Round Steak	Dry/Moist
B	I	51	M	Beef	Round	Round Steak	Moist
B	I	52	M	Beef	Round	Round Steak, Bnls	Moist
B	I	36	D/M	Beef	Round	Tip Roast – Cap Off	Dry/Moist
B	I	57	D	Beef	Round	Tip Steak – Cap Off	Dry
B	I	39	D	Beef	Round	Top Round Roast	Dry
B	I	61	D	Beef	Round	Top Round Steak	Dry
B	N	82	M	Beef	Various	Beef for Stew	Moist
B	N	83	D/M	Beef	Various	Cubed Steak	Dry/Moist
B	N	84	D	Beef	Various	Ground Beef	Dry
P	E	44	D/M	Pork	Ham/Leg	Pork Fresh Ham Center Slice	Dry/Moist
P	E	25	D/M	Pork	Ham/Leg	Pork Fresh ham Rump Portion	Dry/Moist
P	E	27	D/M	Pork	Ham/Leg	Pork Fresh ham Shank Portion	Dry/Moist
P	E	91	D	Pork	Ham/Leg	Smoked Ham, Bnls	Dry
P	E	90	D	Pork	Ham/Leg	Smoked Ham, Center Slice	Dry
P	E	96	D	Pork	Ham/Leg	Smoked Ham, Rump Portion	Dry
P	E	97	D	Pork	Ham/Leg	Smoked Ham, Shank Portion	Dry
P	E	35	D	Pork	Ham/Leg	Tip Roast, Bnls	Dry
P	E	38	D	Pork	Ham/Leg	Top Roast, Bnls	Dry
P	F	05	D/M	Pork	Loin	Back Ribs	Dry/Moist
P	F	66	D/M	Pork	Loin	Blade Chops	Dry/Moist
P	F	67	D/M	Pork	Loin	Blade Chops, Bnls	Dry/Moist
P	F	06	D/M	Pork	Loin	Blade Roast	Dry/Moist
P	F	68	D	Pork	Loin	Butterflied Chops Bnls	Dry
P	F	11	D	Pork	Loin	Center Loin Roast	Dry
P	F	12	D	Pork	Loin	Center Rib Roast	Dry
P	F	70	D	Pork	Loin	Loin Chops	Dry
P	F	71	D	Pork	Loin	Rib Chops	Dry
P	F	73	D	Pork	Loin	Sirloin Chops	Dry

Tennessee FFA Association | Career and Leadership Development Events

Species	Primal	Retail Cut	Cooking Method	Species	Primal	Retail Cut	Cooking Method
P	F	53	D	Pork	Loin	Sirloin Cutlets	Dry
P	F	30	D	Pork	Loin	Sirloin Roast	Dry
P	F	93	D	Pork	Loin	Smoked Pork Loin Chop	Dry
P	F	95	D	Pork	Loin	Smoked Pork Loin Rib Chop	Dry
P	F	34	D	Pork	Loin	Tenderloin, Whole	Dry
P	F	74	D	Pork	Loin	Top Loin Chops	Dry
P	F	75	D	Pork	Loin	Top Loin Chops, Bnls	Dry
P	F	37	D	Pork	Loin	Top Loin Roast, Bnls	Dry
P	J	02	D/M	Pork	Shoulder	Arm Picnic, Whole	Dry/Moist
P	J	03	D/M	Pork	Shoulder	Arm Roast	Dry/Moist
P	J	41	D/M	Pork	Shoulder	Arm Steak	Dry/Moist
P	J	07	D/M	Pork	Shoulder	Blade Boston Roast	Dry/Moist
P	J	42	D/M	Pork	Shoulder	Blade Steak	Dry/Moist
P	J	94	D/M	Pork	Shoulder	Smoked Picnic, Whole	Dry/Moist
P	K	98	D	Pork	Side	Slab Bacon	Dry
P	K	99	D	Pork	Side	Sliced Bacon	Dry
P	K	17	M	Pork	Side/Belly	Fresh Side	Moist
P	L	32	D/M	Pork	Spareribs	Pork Spareribs	Dry/Moist
P	N	85	D	Pork	Various	Ground Pork	Dry
P	N	86	M	Pork	Various	Hock	Moist
P	N	83	D/M	Pork	Various	Pork Cubed steak	Dry/Moist
P	N	87	D	Pork	Various	Pork Sausage Links	Dry
P	N	87	D	Pork	Various	Sausage	Dry
P	N	92	M	Pork	Various	Smoked Pork Hock	Moist
P	N	69	D/M	Pork	Various	Country Style Ribs	Dry/Moist
L	A	24	D/M	Lamb	Breast	Ribs (Denver Style)	Dry/Moist
L	E	01	D	Lamb	Leg	American Style Roast	Dry
L	E	44	D	Lamb	Leg	Center Slice	Dry
L	E	16	D	Lamb	Leg	Frenched Style Roast	Dry
L	E	18	D	Lamb	Leg	Leg Roast, Bnls	Dry
L	E	73	D	Lamb	Leg	Sirloin Chops	Dry
L	E	31	D	Lamb	Leg	Sirloin Half	Dry
L	F	70	D	Lamb	Loin	Loin Chops	Dry
L	F	19	D	Lamb	Loin	Loin Roast	Dry
L	H	71	D	Lamb	Rib	Rib Chops	Dry
L	H	72	D	Lamb	Rib	Rib Chops Frenched	Dry
L	H	22	D	Lamb	Rib	Rib Roast	Dry
L	H	23	D	Lamb	Rib	Rib Roast, Frenched	Dry
L	J	65	D/M	Lamb	Shoulder	Arm Chops	Dry/Moist
L	J	66	D/M	Lamb	Shoulder	Blade Chops	Dry/Moist
L	J	33	D/M	Lamb	Shoulder	Square Cut	Dry/Moist
L	N	88	M	Lamb	Various	Shank	Moist
B	M	76	D/M	Beef	Variety	Heart	Dry/Moist
L	M	76	D/M	Lamb	Variety	Heart	Dry/Moist
P	M	76	D/M	Pork	Variety	Heart	Dry/Moist
B	M	77	D/M	Beef	Variety	Kidney	Dry/Moist
L	M	77	D/M	Lamb	Variety	Kidney	Dry/Moist
P	M	77	D/M	Pork	Variety	Kidney	Dry/Moist
B	M	78	D/M	Beef	Variety	Liver	Dry/Moist
L	M	78	D/M	Lamb	Variety	Liver	Dry/Moist
P	M	78	D/M	Pork	Variety	Liver	Dry/Moist
B	M	79	M	Beef	Variety	Oxtail	Moist
B	M	80	D/M	Beef	Variety	Tongue	Dry/Moist
L	M	80	D/M	Lamb	Variety	Tongue	Dry/Moist
P	M	80	D/M	Pork	Variety	Tongue	Dry/Moist
B	M	81	M	Beef	Variety	Tripe	Moist

USDA BEEF GRADING WORKSHEET

CARCASS YIELD GRADING

Carcass NO.	PYG		Carcass Weight	Required REA	Rib Eye Area		% KPH		FYG
	Est.	Adj.			Est.	Adj.	Est.	Adj.	
1									
2									
3									
4									

Identify the final yield grade (to the nearest tenth) and complete the scan form to match. Full points will be earned for a correct answer and 0.1 above or below official yield grade. A two-point deduction will be made for 0.2 to 0.5 above or below official yield grade. A five-point deduction will be made for 0.6 to 0.9 above or below official yield grade. Zero points will be awarded for answers one yield grade above or below the official yield grade. A perfect score will be a maximum of forty points for each yield grading (ten points for four carcasses).

CARCASS QUALITY GRADING

Carcass No.	Age		Marbling	Quality Grade
	Skeletal Maturity	Lean Adj.		
1				
2				
3				
4				

- Prime High
- Prime Average
- Prime Low
- Choice High
- Choice Average
- Choice Low
- Select High
- Select Low

- Standard High
- Standard Low
- Commercial High
- Commercial Average
- Commercial Low
- Utility High
- Utility Average
- Utility Low

The participant should establish the quality grades for each carcass according to USDA standards. Each participant should complete the section of answers for quality grading on the computerized scorecard.

Canner and Cutter grades will not be used in the event. Ten points will be awarded for each correct grade. Each grade will be scored for the applicable adjacent grade as follows: 10, 8, 5, 0. Yet, in the case of "B" Maturity, Select High and Select Low will be awarded zero points. A perfect score will be a maximum of forty points for quality grading (10 points each for four carcasses).