

National FFA Meats Evaluation and Technology Career Development Event

A Special Project of the National FFA Foundation

Important Note

Please thoroughly read the Introduction Section at the beginning of this handbook for complete rules and procedures that are relevant to all National FFA Career Development Events.

I. Objectives

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

- A. Develop employment skills for students who are interested in exploring or pursuing career opportunities in the meat animal industry.
- B. 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.
- C. Develop broader analytical skills, critical thinking strategies and an understanding of appropriate meat terminology for high school students.
- D. Develop the ability 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.
- E. Develop cooperation and communication skills.

II. Agriculture, Food and Natural Resources (AFNR) Career Cluster Content Standards

With the recommendation of the National FFA Board of Directors, all national FFA programs have incorporated these standards to guide the direction and content of program materials and activities. Refer to Appendix A in this chapter of the handbook for a complete list of the measurable activities that participants will carry out in this event. For details about the incorporation of AFNR standards, refer to the Introduction chapter of the CDE handbook.

III. Event Rules

- A. Each team will be comprised of 3 or 4 members. The top 3 members' scores will be used to determine the total team score.
- B. Participants will report for instructions to the team orientation meeting at the time and place indicated in the current year's team orientation packet.
- C. **Clothing-** Participants must come to the event prepared to work in a cold storage facility (approximately 0° C) for approximately two hours. Participants are required to wear protective clothing: 1) hard hats 2) clean, white frocks 3) hairnets 4) warm clothing and proper footwear. While official dress is not worn during the event, it is recommended for awards presentation activities.
- D. 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.
- E. No conversation will be allowed between participants after the individual activities begin. Conversation among participants constitutes disqualification.
- F. Participants and official judges are to make their placings and identifications without handling the exhibit.
- G. Two minutes stand back time on placing classes will be utilized when applicable.

IV. Event Format

A. The event is comprised of the following activities: a written test, meat formulation problem solving, retail meat cuts identification (30 cuts), Beef Quality and Yield Grading (three-five carcasses), placing of four-six classes (may include keep/cull class), ten questions (from two of the placing classes) and four possible team practicums.

B. Equipment

If not provided, each participant must bring two sharpened No. 2 pencils, a clean clipboard and an electronic calculator. Calculators used in the event should be battery powered, non-programmable and silent. When possible these items will be provided by the event committee, please consult team orientation packet and superintendent letter to determine if these items will be provided. Participants must not bring any blank paper, notes, training aids, other electronic items, purses or backpacks.

Blank paper, training aid sheets and scan forms will be provided by the event committee.

C. Individual Activities

1. Beef Quality and Yield Grading - 80 points maximum

Participants will quality grade and yield grade three to five beef carcasses. (16 points per carcass).

a. *Quality Grading*: Participants may or may not use the training aid provided for Beef Grading. If using the Training Aid II (located at end of Meats Evaluation section), the participant may give the carcass skeletal maturity score and lean maturity score and calculate a final maturity. Then they will assign a marbling score based on USDA standards and then determine the final quality grade. The participant should complete the section of answers for quality grading on the computerized scorecard. Eight points are awarded for each correct grade. Each will be scored for the applicable adjacent grade as follows: 8, 6, 4, 0. However, in the case of "B" Maturity, Select High and Select Low will be awarded zero points.

b. *Yield Grading*: Participants may or may not use the training aid provided for Beef Grading. If using the Training Aid II, participants may write in the carcass weight which is given for each carcass, estimate the carcass preliminary yield grade based on USDA Standards, and then adjust the preliminary yield grade using "Ribeye Area", "Carcass Weight," and "% Kidney, Pelvic and Heart Fat." After completing these steps, the participant may write in the final "Yield Grade" to the nearest one-tenth of a grade. The participant should complete the section of answers for yield grading on the computerized scorecard.

Full points will be earned for 1/10th above or below official yield grade. A two point deduction will be made for 2/10th – 5/10th above or below official yield grade. A four point deduction for 6/10th – 9/10th above or below official yield grade. Zero points will be awarded for answers 1 yield grade above or below the official yield grade.

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

Example: Official Yield Grade (FYG Official) = 2.2

FYG 2.1- 2.3 = full points (8)

FYG 1.7 – 2.0 or 2.4-2.7 = minus 2 points

FYG 1.3 – 1.6 or 2.8 – 3.1 = minus 4 points

Zero points for any FYG a full yield grade above or below official FYG

2. Placing Classes - 350 points maximum

Placing of four to six classes which may include classes of four exhibits OR possibly a keep/cull class of more than four exhibits per class. Classes may come from the following list. Classes may also be ranked using a value based marketing pricing grid provided by event official committee/superintendent of the event.

- Carcasses (beef or pork)

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 backfat have a higher incidence of bellies which 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.

- Value based pricing beef
- Wholesale/subprimal cuts (beef, pork, lamb)
- Retail cuts (beef, pork, lamb)
- Processed meats (cured/smoked center ham slices, shank or rump portion of ham)

a. Keep/Cull Class - 50 points

Participants will be provided with a scenario based on 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.

Example: Select the four ribeye steaks to be sold to a high value “white table cloth” restaurant that advertises superior quality.

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

Correct Selection	*					*	*	*
Exhibit Item	a	b	c	d	e	f	g	h
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.

b. Value Based Pricing Beef Placing Class – 50 points

Participants will place or keep/cull (scenario will be provided) four exhibits (carcasses or wholesale 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.

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 +/-

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 +/-

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

Final Placing = 1 – 2 – 3 - 4

Example**National FFA Meats Evaluation and Technology CDE*****Pricing Sheet***

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 Weight***

<500	(\$27)
500 to 549	(\$16)
550 to 599	(\$4)
900 to 949	(\$2)
950 to 999	(\$4)
1000 and up	(\$19)

Dairy Type*	(\$5)
Bruise	(\$10) per side**

Notes

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

**Maximum discount of \$20 per carcass for bruising

3. Question Classes – 50 points

Two of the four to six placing classes will be selected as classes for questions. A total of ten questions will be asked covering both classes; typically five questions per class but it could vary if needed to make the best possible questions. Questions will not be asked on the keep/cull or the value based beef pricing classes. Answers will be transferred to the appropriate computerized scorecard. Notepaper will be provided for note-taking for two identified questions classes. However, participants will not be able to use their notes when answering questions. Participants will be given a short time period to study their notes before answering questions after they have observed and placed the classes. Questions will be worth five points each.

Guidelines for Questions:

- a. All questions must be written in a manner that they can be answered by only one of the following responses: 1, 2, 3, 4
- b. 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.
- c. When asking questions about the differences within a class, the differences must be visually distinguishable.
- d. Sample 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?
- e. Sample Unacceptable Questions:
 - Which pork carcass had a missing foot?
 - Which beef carcass displayed indications of a bruise?
 - Which ribeye steak was bigger?
- f. A separate scan form will be used for questions during the event.

4. Retail Meat Cuts Identification - 180 points

Participants will identify 30 retail meats cuts found on the “Meats Identification Card.” The official key (Retail Cuts Coding) is located at the end of this chapter of the handbook. Only the cuts listed are eligible to be used in this event. Participants will be given one point for correct species identification, one point for correct primal cut identification, one point for correct cookery and three points for correct retail trade name. Answers will be recorded on a computerized scorecard.

CLARIFICATION OF TERMS FOR RETAIL ID

- **CHOP**—Smaller, flat cuts of meat, usually from the pork, veal or lamb rib, loin or shoulder, generally ranging from ½” to 1½” in thickness. A chop usually is of a size 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 ¾” to 1½” of thickness cut from various parts of a beef carcass, or the shoulder of pork and veal. The size of a steak often is 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.

5. **Meat Formulation Problem Solving - 50 points**

Participants will complete a meat formulation problem solving exercise. An example is at the end of this chapter. Eight questions are to be answered using the computerized scorecard. The one solution to the meat formulation problem will be worth 15 points. The other 7 questions based on the correct formulation will be valued at 5 points each. All problems will be worked to three decimal places and rounded to two places at each step in the calculation. If the third decimal is five or more, the number will be rounded up.
 6. **Written Exam - 80 points**

Each participant will be given a written test relating to meat storage and handling, cookery, nutrition, food safety (HACCP principles, bio-security and personal safety), animal welfare and animal identification systems. Questions could include multiple choice, true/false or situation based questions. Value per question will be based on question type. Maximum points possible on the exam is 80 points.

All questions will be based on materials taken from the “Meat Science and Food Safety” DVD available through CEV Multimedia as listed on the resource material list. See specific DVD chapters to be used each year below:

 - 2012, 2014, 2016: Meat Storage and Handling, Meat Cookery, Processed Meats and Food Safety
 - 2013, 2015: Legislation and History, Animal Care and Handling, Meat Nutrition, Purchasing Meat
- D. **Team Practicums - 4 practicums possible at 50 points each, 200 total points maximum**

The team practicums will be conducted at the product evaluation site after the individual activities. This could be a combination of one or more of each practicum, not to exceed four of the same practicums in each event. A specific practicum may not be utilized in any given year.

 1. **Team Practicum Example #1 - 50 points**

Utilizing carcass, primal or subprimal exhibit, participants will be asked to identify the following from selected locations on the exhibit:

Major muscle groups:

 - Longissimus dorsi
 - Spinalis dorsi
 - Psoas major
 - Gluteus 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 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

2. Team Practicum Example #2 - 50 points

Utilizing the 30 Retail ID cuts, 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 ID cuts utilized in the CDE represent the product you have available in your present meats operation. With this in mind, communicate with your teammates to fill the following orders.

- 1) 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

3. Team Practicum Example #3 - 50 points

Utilizing keep/cull class(es), the participants will work as a team to appraise a class of primal, subprimal or retail cuts. A scenario will be provided which will allow participants to make conclusions. Team members will identify the four exhibits and mark it 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 most juicy, flavorful and tender. Refer to the **Keep/Cull** section from Individual Activities for further instructions.*

4. Team Practicum Example #4 - 50 points

Value Based Pricing Beef Placing Class

Example Scenario: As a team you will review a current 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 beef carcasses.

Refer to the **Value Based Pricing Beef Placing Class** section from Individual Activities for further instructions.

V. Scoring

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

Individual Activities	Possible Maximum Points
Written test	80
Meat formulation problem solving	50
Retail meat cuts identification (30 cuts)	180
Beef Quality and Yield Grading (3-5 carcasses)	80
Placing of 4-6 classes (may include keep/cull class)	300
Ten questions (from two of the placing classes)	50
Total possible points per individual	740
Team Activity	
Four possible team practicums @ 50 points each	200
Total maximum points possible per team*	2,420

*top 3 individual's scores plus team activity score

VI. Tiebreakers

If ties occur, the following events will be used in order to determine award recipients:

Individual

1. Identification Retail Meat Cuts
2. Grading
3. Class Questions

Team

1. Retail ID total of highest three scores
2. Grading total of highest three scores
3. Class questions total of highest three scores

VII. Awards

Awards will be presented at the awards ceremony to teams as well as individuals based upon their rankings. Awards are sponsored by a cooperating industry sponsor(s) as a special project, and/or by the general fund of the National FFA Foundation.

VIII. 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 Core Catalog – <http://shop.ffa.org/cde-materials-c1289.aspx>

- Retail Meat Instructional Materials/Instructor Combo Pack
- Retail Meat Team Combo Pack
- Retail Meats Field Guide
- Retail Meats Flash Cards
- Meat Identification Tutorial CD-ROM

- Meat Buyer's Guide
- NAMP Meat Posters
- Beef, Lamb, Pork and Veal Cut Charts
- Meats Evaluation Scan Forms
- National FFA CDE Q&A's (2007-2010)
- FFA Learn-National FFA CDE Q&A's (2005 & 2006) <https://ffa.learn.com/learncenter.asp?id=178409&page=31&mode=preview>

CEV Multimedia

1020 SE Loop 289, Lubbock, TX 79404, (800) 922-9965

- Retail Cuts Identification (DVD)
- Meat Science and Food Safety (DVD) - written exam resource

Beef Myology - <http://bovine.unl.edu/bovine3D/eng/nIntro.jsp>

National Cattlemen's Beef Association

9110 E. Nichols Ave. #300, Centennial, CO 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/page.aspx?id=539>

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, WI 53538-0901, 1-800-558-9595

- Preliminary Yield Grade Rulers (<http://www.enasco.com/product/C02615N>)
- Beef and Pork Ribeye Grids

Example Meats Evaluation Websites of Classes and Materials

<http://aggiemeat.tamu.edu/judging/meatjudging.html>

<http://animalscience.unl.edu/meats/id/>

IX. Examples

A. Written Test Examples

Sample Questions:

1. What is the maximum amount of fat that ground beef may contain?
*A. 30% C. 40%
B. 10% D. 20%

2. 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

B. Meat Formulation Problem Solving

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 of red meat is considered 28°F and below.
- Freshness: Slaughter date is included when counting. For example, processing on October 26 with a 72 hour freshness specification means October 25, 24 and 23 are good dates; October 22 or earlier are unacceptable dates.

Meat Formulation Problem Solving

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° F.
- Least cost determined 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, October 20, 2010

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. Completely fill the chosen oval to indicate your answer.

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

1. 75% Trimmings and Beef Heart
2. **75% Trimmings and Bull Product**
3. 75% Trimmings and Chuck Tender
4. 75% Trimmings 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

What was the total cost of the correct final batch?

- A. \$2,523.00
- B. \$4,544.00
- C. \$5,356.00
- D. **\$7,067.00**
- E. \$7,240.00

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

What was the percentage of lean in the correct final batch?

- A. 17.0%
- B. 20.0%
- C. 29.0%
- D. 71.0%
- E. **80.0%**

What percentage of the correct final batch was Chuck Tender?

- A. **0%**
- B. 16%
- C. 29%
- D. 56%
- E. 71%

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.

Which ingredient was excluded on the basis of temperature?

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

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.

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

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

Calculations for Meats Evaluation and Technology Meat 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% Trim-mings	\$1.28	25%	20%	4	0.44	2200.00 Lbs.	\$2,816.00
Ingredient With Least Fat =	Chuck Tender	\$1.58	16%		5	0.56	2800.00 Lbs.	\$4,424.00
Sum =					9	Total Cost of Batch =		\$7,240.00
								Price per Pound = \$1.45

Possible Questions:

Amount of Fat = 1000.00 Lbs.
Amount of Lean = 4000.00 Lbs.
Percentage Fat = 20.00%
Percentage Lean = 80.00%

Calculations for Meats Evaluation and Technology Meat 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% Trim-mings	\$1.28	25%	20%	8	0.62	3100.00 Lbs.	\$3,968.00
Ingredient With Least Fat =	Ribeye Roll	\$2.12	12%		5	0.38	1900.00 Lbs.	\$4,028.00
Sum =					13	Total Cost of Batch =		\$7,996.00
								Price per Pound = \$1.60

Possible Questions:

Amount of Fat = 1000.00 Lbs.
Amount of Lean = 4000.00 Lbs.
Percentage Fat = 20.00%
Percentage Lean = 80.00%

Calculations for Meats Evaluation and Technology Meat Formulation Problem								
		Batch Size =		5,000 Lbs				
Ingredient	Ingredient Name	Price/Lb.	Fat Content	Desired Fat %	Multiples	Proportion of Batch	Lbs. Of Batch	Cost
Ingredient With Most Fat =	75% Trim-mings	\$1.28	25%	20%	12	0.71	3550.00 Lbs.	\$4,544.00
Ingredient With Least Fat =	Bull Product	\$1.74	8%		5	0.29	1450.00 Lbs.	\$2,523.00
Sum =					17	Total Cost of Batch =		\$7,067.00
							Price per Pound =	\$1.41
Possible Questions:		Amount of Fat =		1000.00 Lbs.				
		Amount of Lean =		4000.00 Lbs.				
		Percentage Fat =		20.00%				
		Percentage Lean =		80.00%				

This calculator is utilized by Tarleton State University when assisting with FFA Meats CDE activities.

Meat Formulation Problem (50 Points)

USDA Regulations for Wiener Products:

WIENER: A small variety of cooked sausage of the frankfurter-bologna variety.

COOKED SAUSAGE (general): Semisolid sausage that is generally cured and may or may not be smoked. The quantity of added water is limited to 10 % of the finished product. Normally, the product is limited to 30 % fat, however, USDA allows for a combination of not more than 40 % fat and water. They may or may not include extenders and binders up to 3.5 %.

COOKED SAUSAGE (variety): Includes Frankfurter, Bologna, Wiener or other similar sausages. These are the only types of sausages which can contain up to 15 % poultry meats without qualifications in the product name. They are usually comminuted (emulsified), cooked, cured and if by-products are added, the name must be qualified as “with Variety Meats.” Sausages formulated with one species of skeletal red meat are labeled such as “Beef Bologna”, with the species in the product name.

Company Policy for Wiener Products:

1. No product may be used over 35 F.
2. Frozen product may not be used if stored longer than 45 days.
3. All fresh ingredients must have been slaughtered within 96 hours.
4. No variety meats may be used.
5. No head or cheek meat may be used.
6. Product must contain both beef and pork with no less than 60 % pork.
7. No imported product may be used.

The Order:

As the production supervisor at a medium size meat processing plant that specializes in custom designed sausage products you must produce a wiener for a new restaurant in your city that sells hot dogs as a primary menu item. The product must meet company specifications and inspection regulations. It will be a cured, fully-cooked wholesome product that must contain both pork and beef ingredients. The product must have a 90 day shelf life after it leaves the plant.

- A. Fat content of the finished product is 30 %
- B. Manufacturing date is October 26
- C. Batch size is 500 pounds

BONELESS MEAT INGREDIENTS AVAILABLE

PRODUCT	SLAUGHTER DATE	TEMP	FAT CONTENT	\$ PRICE
1. Beef hearts	October 25	33 F	15 %	\$0.17
2. Beef trimmings, fresh 50 %	October 24	33 F	50 %	\$0.63
3. Beef trimmings, frozen 94 %	August 20	34 F	06 %	\$1.41
4. Skinned jowls	October 23	34 F	62 %	\$0.35
5. Beef trimmings, frozen 50 %	October 01	10 F	50 %	\$0.48
6. Picnic cushion meat	October 23	31 F	25 %	\$0.78
7. Lean pork trimmings 72 %	October 24	32 F	28 %	\$0.71
8. Imported Australia Bull 95 %	July 24	0 F	05 %	\$1.47
9. Regular pork trim 42 %	October 23	37 F	52 %	\$0.48
10 Cheek meat, pork Trimmed	October 23	34 F	25 %	\$0.82
11. Pork loin, bnls, Strap off	October 24	32 F	15 %	\$1.62
12.. Cow trimmings, fresh 85 %	October 23	33 F	15 %	\$1.30

Answer the Following Questions:

Formulation Solution:

1. _____ is the correct least cost formulation for the wiener order.
1. Beef trimmings, 50%, fresh and lean pork trimmings 72% \$0.69
 2. Beef heart and lean pork trimmings, 72% \$0.58
 3. Regular pork trim, 42% and Beef trimmings, 94%, frozen \$0.76
 - 4. Lean pork trimmings, 72% and Beef trimmings 50 % frozen \$0.69**
 5. Imported Australia bull and Skinned jowl \$0.97
 6. Cow trimmings, 85 %, fresh and Skinned jowl \$0.99
 7. Lean pork trimmings, 72% and Skinned jowl \$0.69
 8. Beef trimmings,50%, frozen and Cheek meat \$0.74
 9. Regular pork trimmings, 42% and lean pork trimmings 72% \$0.69
 10. Pork loin, bnls, strap off and Beef trimmings, 50%, fresh \$0.67

Formulation Questions:

1. Of the following ingredients which one is not acceptable for the wiener?
 - a. Beef trimmings, fresh, 50%
 - b. Beef trimmings, frozen, 50%
 - c. Imported Australia bull, 95%**
 - d. Skinned jowls
2. Which of the following ingredients is unacceptable to use due to date?
 - a. Beef trimmings, frozen, 50%
 - b. Regular pork trim, 42%
 - c. Beef trimmings, frozen, 94%**
 - d. Beef hearts
3. A wiener product may contain what percent poultry products without qualification in the product name?
 - a. 05%
 - b. 10%
 - c. 20%
 - d. 15%**
4. If all the following ingredients were acceptable choices for the wiener order, which combination could not be used to meet the company policy content of the order?
 - a. Beef trimming, frozen, 50% and picnic cushion meat
 - b. Pork loin, bnls, strap off and regular pork trim**
 - c. Lean pork trimmings, 72% and Beef trimmings, fresh ,50%
 - d. Picnic cushion meat and beef trimmings fresh, 50%
5. By which date should the restaurant manager have used all of the product purchased from this order?
 - a. February 24, 2008
 - b. January 24, 2008**
 - c. March 24, 2008
 - d. April 24, 2008
6. The weight of beef trimmings, fresh in the solution is at or nearest:
 - a. 0, none used**
 - b. 45 pounds

- c. 455 pounds
d. 490 pounds
7. What percent of the final solution is lean pork trimmings, 72%?
a. 09%
b. 60%
c. 91%
d. 55%
8. The meat plant spent how many total dollars on the material used to manufacture the wieners for this order?
a. \$345.00
b. \$453.00
c. \$499.00
d. \$300.00

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	Porterhouse 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

Retail Cuts Code Sheet with Cookery (cont.)

Species	Primal	Retail Cut	Cooking Method	Species	Primal	Retail Cut	Cooking Method
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	69	D/M	Pork	Loin	Country Style Ribs	Dry/Moist
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
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

Retail Cuts Code Sheet with Cookery (cont.)

Species	Primal	Retail Cut	Cooking Method	Species	Primal	Retail Cut	Cooking Method
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
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

Retail Cuts Code Sheet with Cookery (cont.)

Species	Primal	Retail Cut	Cooking Method	Species	Primal	Retail Cut	Cooking Method
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 TRAINING AID 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									
5									

Identify the final yield grade (to the nearest tenth) and complete the scan form correspondingly. Full points will be earned for a correct answer and 1/10th above or below official yield grade. A two point deduction will be made for 2/10th – 5/10th above or below official yield grade. A four point deduction for 6/10th – 9/10th above or below official yield grade. Zero points will be awarded for answers one yield grade above or below the official yield grade. Perfect score will be a maximum of forty points (eight points for five carcasses).

Carcass Quality Grading

Carcass No.	Age		Marbling	Quality Grade
	Skeletal Maturity	Lean adj.		
1				
2				
3				
4				
5				

Prime High	Select High	Commercial High
Prime Avg.	Select Low	Commercial Ave.
Prime Low	Standard High.	Commercial Low
Choice High	Standard Low	Utility High
Choice Avg.		Utility Avg.
Choice Low		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. Eight points are awarded for each correct grade. Each will be scored for the applicable adjacent grade as follows: 8, 6, 4, 0. Yet, in the case of “B” Maturity; Select High and Select Low will be awarded zero points. Perfect score will be a maximum of forty points (eight points for five carcasses).

Appendix A: AFNR Career Cluster Content Standards

	Performance Measurement Levels	Event Activities Addressing Measurements	Related Academic Standards
	ABS.01.01. Performance Indicator: Apply principles of capitalism in the business environment.		Social Studies: 7b and 7g
	ABS.01.01.01.a. Recognize principles of capitalism as related to AFNR businesses.	placing, formulation, practicum, exam	
	AS.02.02. Performance Indicator: Apply principles of comparative anatomy and physiology to uses within various animal systems.		Science: C1, C5 and F2
	AS.02.02.01.c. Explain how the components and systems of animal anatomy and physiology relate to the production and use of animals.	retail ID, team practicum	
	AS.02.03. Performance Indicator: Select animals for specific purposes and maximum performance based on anatomy and physiology.		Science: C5
	AS.02.03.01.c. Evaluate and select animals to maximize performance based on anatomical and physiological characteristics that affect health, growth and reproduction.	placings, exam, formulation, practicum, team activity	
	AS.02.03.02.b. Assess an animal to determine if it has reached its optimal performance level based on anatomical and physiological characteristics.	grading, questions	
	AS.04.02. Performance Indicator: Prescribe and administer animal feed additives and growth promotants in animal production.		Science: C5
	AS.04.02.01.b. Discuss how feed additives and growth promotants are administered and the precautions that should be taken.	exam, team activity	
	AS.06.02. Performance Indicator: Implement procedures to ensure that animal products are safe.		Science: F1 and F5
	AS.06.02.01.b. Discuss consumer concerns with animal production practices relative to human health.	exam, team activity	
	FPP.01.01. Performance Indicator: Evaluate the significance and implications of changes and trends in the food products and processing industry.		Science: F1 Language Arts: 7 and 8 Social Studies: 1g and 8c
	FPP.01.01.01.b. Evaluate changes and trends in the food products and processing industry.	retail ID, exam, team activity, placings, questions	
	FPP.01.02. Performance Indicator: Work effectively with industry organizations, groups and regulatory agencies affecting the food products and processing industry.		Language Arts: 12 Social Studies: 6c and 8f
	FPP.01.02.02.b. Discuss the application of industry standards in the food products and processing industry.	all activities	

FPP.03.01. Performance Indicator: Apply principles of science to food processing to provide a safe, wholesome and nutritious food supply.		Science: A2, B3 and F1
	FPP.03.01.01.a. Discuss how research and industry developments lead to improvements in the food products and processing industry.	problem solving, team activity, exam
	FPP.03.01.02.b. Explain how the chemical and physical properties of foods influence nutritional value and eating quality.	exam
FPP.04.01. Performance Indicator: Utilize harvesting, selection and inspection techniques to obtain quality food products for processing.		Science: F1 Language Arts: 12
	FPP.04.01.01.c. Assign quality and yield grades to food products according to industry standards.	grading, placing, team activity
	FPP.04.01.02.b. Perform quality-control inspections of raw food products for processing.	problem solving, placing, team activity, grading
	FPP.04.01.03.b. Compare and contrast accepted animal treatment and harvesting techniques.	exam
	FPP.04.01.04.c. Conduct [pre-mortem and] post-mortem inspections of animals.	placing classes, grading, retail cut ID, team activity
FPP.04.02. Performance Indicator: Evaluate, grade and classify processed food products.		Science: F1 Language Arts: 8
	FPP.04.02.01.c. Evaluate, grade and classify processed meat, egg, poultry, fish and dairy products.	all activities

Appendix B: Related Academic Standard

National academic standards for mathematics, science, English language arts and social studies related to this event are reported below. The statements are based on information in reports of the respective associations/organizations in the academic areas. Some adjustment of numbering was done to facilitate the process of alignment with the standards that have been developed in the pathways of the Agriculture, Food and Natural Resources (AFNR) Career Cluster.

The approach was to determine the presence of alignment between the content standards, expectations or thematic strands of the four academic areas and the performance indicators of the AFNR Standards. Supporting statements have been included to clarify content of the respective content standards, expectations or thematic strands. The statements were initially developed independently by the respective organizations and, therefore, are not parallel in wording and presentation. Occasionally minor editing was done to adjust the background or stem of a statement but not the statement itself.

Science

- A. Content Standard: Science as an Inquiry
 - A2. Design and conduct scientific investigations.
- B. Content Standard: Physical Science
 - B3. Chemical reactions
- C. Content Standard: Life Science
 - C1. The cell
 - C5. Matter, energy and organization in living systems
- E. Content Standard: Science and Technology
 - E2. Understanding about science and technology
- F. Content Standard: Science in Personal and Social Perspectives
 - F1. Personal and community health
 - F2. Population growth
 - F5. Natural and human-induced hazards

English Language Arts

- 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate and synthesize data from a variety of sources (e.g., print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.
- 8. Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.
- 12. Students use spoken, written and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion and the exchange of information).

Social Studies

- 1. Thematic Strand: Culture
 - 1g. construct reasoned judgments about specific cultural responses to persistent human issues;
- 6. Thematic Strand: Power, Authority and Governance
 - 6c. analyze and explain ideas and mechanisms to meet needs and wants of citizens, regulate territory, manage conflict, establish order and security and balance competing conceptions of a just society;

7. Thematic Strand: Production, Distribution and Consumption

7b. analyze the role that supply and demand, prices, incentives and profits play in determining what is produced and distributed in a competitive market system;

7g. compare basic economic systems according to how rules and procedures deal with demand, supply, prices, the role of government, banks, labor and labor unions, savings and investments and capital;

8. Thematic Strand: Science, Technology and Society

8a. identify and describe both current and historical examples of the interaction and interdependence of science, technology and society in a variety of cultural settings;

8c. analyze how science and technology influence the core values, beliefs and attitudes of society, and how the core values, beliefs and attitudes of society shape scientific and technological change;

8f. formulate strategies and develop policies for influencing public discussions associated with technology-society issues, such as the greenhouse effect.