Meats Evaluation

Purpose

The meat industry is an important component in Missouri agriculture. The Meat Identification and Judging Career Development Event was developed to encourage secondary agriculture students to develop skills and abilities needed to enter and advance in careers in the meat industry.

Objectives

The State Agriculture Meat Identification and Judging CDE is designed to:

I. Develop employment knowledge for students who are interested in exploring and pursuing a career in the meat industry.

II. Aid the local agriculture instructor in motivating students to become involved in the industry of animal marketing and merchandising.

III. Encourage the development of broader analytical skills, critical thinking strategies, and an understanding of appropriate meat terminology for high school students.

IV. Develop the students' 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.

Crosswalk with Show Me Standards

Objectives – Students participating in the Career Development Event should be able to:		Show-Me Standards	
		Knowledge Standards (Content Areas)	**Performance Standards (Goals)**
1.	Develop employment knowledge for students who are interested in exploring and pursuing a career in the meat industry.	CA.3 MA.1, MA.3 SC.3 SS.4	1.5 3.5, 3.6, 3.8 4.4, 4.7, 4.8
2.	Aid the local agriculture instructor in motivating students to become involved in the industry of animal marketing and merchandising.		
3.	Encourage the development of broader analytical skills, critical thinking strategies, and an understanding of appropriate meat terminology for high school students.		
4.	Develop the students' 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.		

CORRESPONDING SECONDARY AGRICULTURE CURRICULUM			
Course and/or Curriculum:	Agriculture Science I	**Unit(s):**	Introduction to Animal Products
	Food Science and Technology		Unit II – Food Processing Lesson 6 – Products and By-Products from Meat Animals Lesson 7 – Processing Meat Animals Lesson 8 – Quality Grades, Inspections, and Brand Names in Meat Industry

Event Format

1. The Meat Evaluation CDE shall consist of the following four (4) components:

2. Identification of Retail Cuts of Meat -
   a. Forty (40) various retail cuts of meat and variety meats from Beef, Lamb, and Pork will be placed in a convenient manner and given an identification number.
   b. Contestants will identify the species, primal cut, and retail name of each cut as listed on LIST 7 – Primal/Retail Cuts Coding.
   c. Approximately one minute for each cut will be the time allowed for identification.
   d. **Duplicate samples may not be used in any identification portion of the event.**
3. Judging Classes of Meat -
   a. Four (4) classes will be judged, each consisting of four (4) samples.
   b. Classes may be carcasses of beef, pork, or lamb; primal cuts of beef or pork; retail cuts of beef or pork.
   c. Primal cuts may include fresh hams, pork loins, pork Boston shoulders (butts), pork picnic shoulders, beef ribs, beef chucks, beef loins, beef rounds, beef strip loins, and beef rib eye roasts.
   d. Ten questions will be required on one of the judging classes. The format will be a 50 point multiple choice/true-false test relating to placing the class.
      Example: Which rib eye has the highest degree of marbling?
      a. 1 b. 2 c. 3 d. 4
4. Multiple Choice Exam - The test will consist of 20 multiple choice questions based on the Meats Units available from IML.
5. Meats Formulation Problem – Contestants will complete an industry-based practicum requiring them to select the lowest cost method of developing a further-processed meat product. Points will be earned for selecting the correct formulation and answering multiple choice questions relating to the data provided within the practicum. **<u>The Formulation Problem is to have a correct formulation solution that includes only two (2) ingredients.</u>**

   ⇒ The ingredients will be cuts on the CDE Event list, lean trimmings from any of the three species of animals included on the contest, variety meats, cheek meat & trim and course grinds from the species in the CDE Event.

   ⇒ This may include, but is not limited to, the following examples:
   - Fresh lamb shoulder
   - Beef Cheek Meat
   - Point Half Brisket
   - Pork Heart
   - 80/20 Beef fine grind

   ⇒ This list would not include cuts of:
   - Goose Neck Round
   - London Broil
   - New York Strip
   - ETC.

Event Scoring

Event	Points
Identification of Retail Cuts of Meat – 40 @ 6 points each	240 points
Judging Classes – 4 classes @ 50 points each	200 points
Questions on one Judging Class – 10 questions @ 5 points each	50 points
Written Test – 20 questions @ 3 points each	60 points
Meat Formulation Problem –	50 points
TOTAL	**600 points**

1. Tie scores among teams will be broken using the high individual team member's score. In case the scores are tied, the scores of the second high individual on each team should be used.

Event Rules and Regulations

1. Contestants must not communicate with each other while the event is in progress.
2. All coaches, alternates, and others, except the superintendent, his/her assistants, contestants, and the judges will be excluded from the Meats Laboratory. Any assistance given a team member from any source during the contest will be sufficient cause to eliminate that team from the contest.
3. Official placing and discussion of classes will be held immediately following the event. Instructors, contestants, alternates and other interested persons are encouraged to attend.
4. **Contestants must come to the event prepared to work in a cold storage facility with a room temperature of 40°F or lower.**
   - **A. *Required attire includes:***
     1. **Closed-toed shoes,**
     2. **Clean head cover; which may include hard hats, clean baseball caps, or hairnets,**
     3. **Long pants or skirts that cover the entire leg.**
   - **B. Suggested attire:**
     - **white lightweight frocks,**
     - **disposable frocks,**
     - **heavy sweaters, coats, and/or other warm clothes.**

5. Calculators may be used. In all events, only six-function, (nonprogrammable and non-graphing) models may be used. Therefore, the calculators are limited to the following keys: Plus (+); Minus (-); Multiplication (x); Division (/); Equals (=); Memory Clear/Recall (MRC); Memory Minus (M-); Memory Plus (M+); Plus / Minus (+/-); Percentage (%); Square Root (√). See page 3, rule #8 of the General CDE Guidelines for an example.

6. Contestants will be allowed to bring steno-pads, but must be CLEAN or NOT WRITTEN ON prior to the start of the event.

References

Yellow Pages – American Meat Institute, P.O. Box 3556, Washington, D.C. 20007. Phone: 703-841-2400.

National Association of Meat Purveyors (1988). The Meat Buyers Guide. 8365-B Greensboro Drive, McLean, VA 22102; Phone: (703) 827-5754.

National Live Stock and Meat Board. Uniform Retail Meat Identify Standards. Department of Merchandising, National Live Stock and Meat Board, 444 North Michigan Ave., Chicago, IL 60611.

Introduction to Animal Products (1998). IML available via MCCE website: http://www.missouricareereducation.org/home.php

Meat Evaluation Handbook. (National Cattlemen's Beef Association 2001) IML, 1400 Rock Quarry Rd. Q156, University of Missouri, Columbia, MO 65202. (800) 669-2465 http://iml-ag.missouri.edu/

Meat Judging and Grading Revised 1998. IML available via MCCE website: http://www.missouricareereducation.org/home.php

Meat Judging: Fundamentals - Video Active. IML available via MCCE website: http://www.missouricareereducation.org/home.php

National Career Development Events (2006-2010). National FFA Organization.
*Teams can prepare for the meats formulation problem using the provided sample problems or see the National Career Development Events Meat Evaluation and Technology Section for details (http://www.ffa.org/documents/cde_meats.pdf).

Forms

See the following: List 7, Form 7, Formulation Problem Solving Instructions/Sample.

LIST 7

PRIMAL - RETAIL CUTS CODING

PRIMAL / RETAIL CUTS CODING

PRIMAL CUTS	RETAIL CUTS	SPECIES	PRIMAL CODE	RETAIL CODE
BEEF				
Brisket	Corned Brisket	B	2	90
	Flat Half (Bnls)	B	2	15
	Brisket, Whole	B	2	10
Chuck	7-Bone Pot-Roast	B	3	26
	Arm Pot Roast	B	3	3
	Arm Pot Roast (Bnls)	B	3	4
	Blade Roast	B	3	6
	Chuck Eye Roast (Bnls)	B	3	13
	Chuck Eye Steak (Bnls)	B	3	45
	Mock Tender Roast	B	3	20
	Mock Tender Steak	B	3	48
	Petite Tender	B	3	21
	Shoulder Pot Roast (Bnls)	B	3	29
	Top Blade Steak (Flat Iron)	B	3	59
Flank	Flank Steak	B	4	47
Loin	Porterhouse Steak	B	7	49
	T-Bone Steak	B	7	56
	Tenderloin	B	7	34
	Tenderloin Steak	B	7	57
	Top Loin Steak	B	7	60
	Top Loin Steak (Bnls)	B	7	61
	Top Sirloin Cap Steak (Bnls)	B	7	65
	Top Sirloin Steak (Bnls) Cap Off	B	7	64
	Top Sirloin Steak (Bnls)	B	7	63
	Tri Tip Roast	B	7	40
Plate	Short Ribs	B	8	28
	Skirt Steak (Bnls)	B	8	55
Rib	Rib Roast	B	9	22
	Ribeye Roast (Bnls)	B	9	14
	Ribeye Steak (Bnls)	B	9	50

	Ribeye Steak Lip-On	B	9	51
Round	Bottom Round Roast	B	10	8
	Bottom Round Rump Roast	B	10	9
	Bottom Round Steak	B	10	43
	Eye Round Steak	B	10	46
	Round Steak	B	10	52
	Round Steak (Bnls)	B	10	53
	Tip Roast - Cap Off	B	10	36
	Tip Steak - Cap Off	B	10	58
	Top Round Roast	B	10	39
	Top Round Steak	B	10	62
Various	Beef for Stew	B	15	83
	Cubed Steak	B	15	84
	Ground Beef	B	15	85
Variety	Heart	B	14	77
	Kidney	B	14	78
	Oxtail	B	14	80
	Tongue	B	14	81
	Tripe	B	14	82
PORK				
Ham/Leg	Center Slice	P	5	44
	Fresh Ham Rump Portion	P	5	25
	Fresh Ham Shank Portion	P	5	27
	Smoked Ham (Bnls)	P	5	92
	Smoked Ham Center Slice	P	5	91
	Smoked Ham Rump Portion	P	5	97
	Smoked Ham Shank Portion	P	5	98
	Tip Roast (Bnls)	P	5	35
	Top Roast (Bnls)	P	5	38
Loin	Back Ribs	P	7	5
	Blade Chops	P	7	67
	Blade Chops (Bnls)	P	7	68
	Blade Roast	P	7	6
	Butterflied Chops (Bnls)	P	7	69
	Center Loin Roast	P	7	11

	Center Rib Roast	P	7	12
	Country Style Ribs	P	7	70
	Loin Chops	P	7	71
	Rib Chops	P	7	72
	Sirloin Chops	P	7	74
	Sirloin Cutlets	P	7	54
	Sirloin Roast	P	7	30
	Smoked Loin Chops	P	7	94
	Smoked Rib Chops	P	7	96
	Tenderloin	P	7	34
	Top Loin Chops	P	7	75
	Top Loin Chops (Bnls)	P	7	76
	Top Loin Roast (Bnls)	P	7	37
Shoulder	Arm Roast	P	11	2
	Arm Steak	P	11	41
	Blade Boston Roast	P	11	7
	Blade Steak	P	11	42
	Smoked Picnic, Whole	P	11	95
Side/Belly	Slab Bacon	P	12	99
	Sliced Bacon	P	12	100
	Fresh Side	P	12	17
Spareribs	Pork Spareribs	P	13	32
Various	Ground Pork	P	15	86
	Hock	P	15	87
	Cubed Steak	P	15	84
	Sausage/ Sausage Links	P	15	88
	Smoked Hock	P	15	93
Variety	Heart	P	14	77
	Kidney	P	14	78
	Liver	P	14	79
	Tongue	P	14	81
LAMB				
Breast	Ribs (Denver Style)	L	1	24
Leg	American Style Roast	L	6	1
	Center Slice	L	6	44
	Frenched Style Roast	L	6	16

	Leg Roast, Bnls	L	6	18
	Sirloin Chops	L	6	74
	Sirloin Half	L	6	31
Loin	Loin Chops	L	7	71
	Loin Roast	L	7	19
Rib	Rib Chops	L	9	72
	Rib Chops Frenched	L	9	73
	Rib Roast	L	9	22
	Rib Roast Frenched	L	9	23
Shoulder	Arm Chops	L	11	66
	Blade Chops	L	11	67
	Square Cut	L	11	33
Various	Shank	L	15	89
Variety	Heart	L	14	77
	Kidney	L	14	78
	Liver	L	14	79
	Tongue	L	14	81

Form 7

Meat Identification Card - Training Aid

Name: _____ Contestant Number: _____

School: _____ School Number: _____

Select: Species (1 point), Primal Cuts (2 points), and Retail Name (3 points) from listings below and fill in the column blanks beside the cut number. The score column is for tabulation only. Total - 240 points.

SPECIES – 1 point **B**=Beef **P**=Pork **L**=Lamb

Cut No.	Species	Primal	Retail	Score
1.				
2.				
3.				
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38.				
39.				
40.				

Primal Cuts – 2 Points

01. Breast	**06. Leg**	**11. Shoulder**
02. Brisket	**07. Loin**	**12. Side/ Belly**
03. Chuck	**08. Plate**	**13. Spareribs**
04. Flank	**09. Rib**	**14. Variety**
05. Ham/Leg	**10. Round**	**15. Various**

Retail Cuts – 3 Points

Roasts/Pot Roasts

001. American Style Rst.
002. Arm Roast
003. Arm Pot Roast
004. Arm Pot Roast (Bnls)
005. Back Ribs
006. Blade Roast
007. Blade, Boston Roast
008. Bottom Round Roast
009. Bottom Round Rump Roast
010. Brisket, Whole (Bnls)
011. Center Loin Roast
012. Center Rib Roast
013. Chuck Eye Roast (Bnls)
014. Ribeye Roast (Bnls)
015. Flat Half (Bnls)
016. Frenched Style Roast
017. Fresh Side
018. Leg Roast (Bnls)
019. Loin Roast
020. Mock Tender Roast
021. Petite Tender
022. Rib Roast
023. Rib Roast, Frenched
024. Ribs (Denver Style)
025. Pork Fresh Ham Rump Portion
026. 7-Bone Pot -Roast
027. Pork Fresh Ham Shank Portion
028. Short Ribs
029. Shoulder Pot Roast (Bnls)
030. Sirloin Roast
031. Sirloin Half
032. Pork Spareribs
033. Square Cut
034. Tenderloin
035. Tip Roast (Bnls)
036. Tip Roast – Cap Off
037. Top Loin Roast (Bnls)
038. Top Roast (Bnls)
039. Top Round Roast
040. Tri Tip Roast

Steaks

041. Arm Steak
042. Blade Steak
043. Bottom Round Steak
044. Center Slice
045. Chuck Eye Steak (Bnls)
046. Eye Round Steak
047. Flank Steak
048. Mock Tender Steak
049. Porterhouse Steak
050. Ribeye Steak (Bnls)
051. Ribeye Steak, Lip-On
052. Round Steak
053. Round Steak (Bnls)
054. Sirloin Cutlets
055. Skirt Steak (Bnls)
056. T-Bone Steak
057. Tenderloin Steak
058. Tip Steak, Cap Off
059. Top Blade Steak (Flat Iron)
060. Top Loin Steak
061. Top Loin Steak (Bnls)
062. Top Round Steak
063. Top Sirloin Steak (Bnls)
064. Top Sirloin Steak (Bnls) Cap-Off
065. Top Sirloin Cap Steak (Bnls)

Chops

066. Arm Chops
067. Blade Chops
068. Blade Chops (Bnls)
069. Butterflied Chops (Bnls)
070. Country Style Ribs
071. Loin Chops
072. Rib Chops
073. Rib Chops Frenched
074. Sirloin Chops
075. Top Loin Chops
076. Top Loin Chops (Bnls)

Variety Meats

077. Heart
078. Kidney
079. Liver
080. Oxtail
081. Tongue
082. Tripe

Various

083. Beef for Stew
084. Cubed Steak
085. Ground Beef
086. Ground Pork
087. Hock
088. Sausage / Sausage Links
089. Shank

Smoked/ Cured Meats

090. Corned Brisket
091. Smoked Ham, Center Slice
092. Smoked Ham (Bnls)
093. Smoked Hock
094. Smoked Loin Chops
095. Smoked Picnic, Whole
096. Smoked Rib Chops
097. Smoked Ham, Rump Portion
098. Smoked Ham, Shank Portion
099. Slab Bacon
100. Sliced Bacon

MEATS FORMULATION PROBLEM SOLVING INSTRUCTIONS/SAMPLE

Students will be given a situational problem solving 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.

GROUND BEEF FORMULATION PROBLEM TRAINING MATERIALS

Assume that you manage a meat plant that manufactures ground beef or a chain of retail stores. Your goal is to produce a fresh, wholesome product that complies with all meat inspection regulations and will have three days' shelf life in the meat case. The fat content must comply with the specifications of the stores. The cost of the product should be as low as possible.

Ground Beef Regulations (USDA)

GROUND BEEF: The terms "Ground Beef" and "Chopped Beef" are synonymous. Products so labeled must be made with fresh and/or frozen beef with or without seasoning, and without the addition of fat as such, and shall contain no more than 30% fat. It may contain added water, binders or extenders. It may contain beef cheek meat not to exceed 25%. Heart meat and tongue meat are not acceptable ingredients.

If the name is qualified by the name of a particular cut, such as "Ground Beef Round" or "Beef Chuck, Ground", the product must consist entirely of meat from the particular cut or part.

Industry Guidelines on Ground Beef Manufacture

1. To get the most desirable color and maximum shelf life, all boneless meats used to manufacture ground beef shall be fresh (not frozen), well chilled (temperature no higher than 35°F) and shall arrive at the plant within 96 hours of animal slaughter.

2. A least-cost determination shall be performed on acceptable meat ingredients to select those meats that produce the lowest-cost product that meets all ground beef guidelines.

3. To simplify the grinding and blending operation, only two meat ingredients will be used for each batch.

4. Rounding of decimals: 5-9 will be rounded up; 1-4 will be rounded down.

SAMPLE PROBLEM ONE

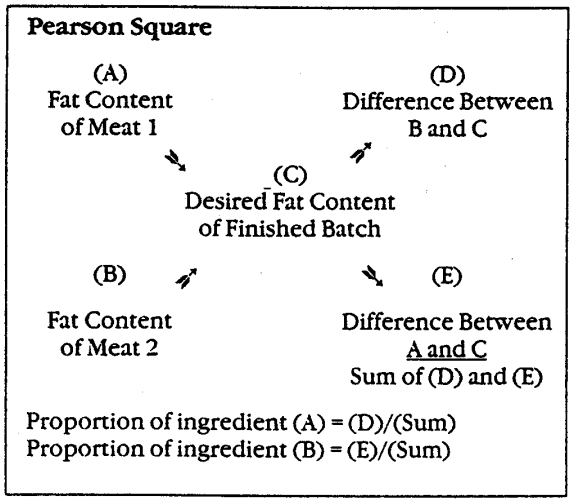
Use the Pearson Square to formulate a batch of ground beef to the desired fat content.

Meats:
(1) Boneless cow meat (10% fat-$.99/lb.)
(2) 75% lean beef trimmings (25% fat-$.79/lb.)

Desired Final Fat Content: 20%
Batch Size: 1,000 lbs.

Determine:
a. The amounts of the two types of meat that must be blended together to give the desired fat content.
b. The meat cost of the finished product.*

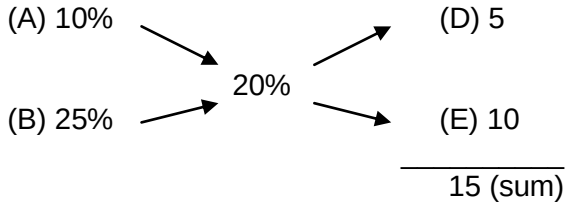
**NOTE: You will only be determining meat costs. In an actual situation overhead cost must also be added to the cost of the ground beef to account for labor, equipment, transportation, etc. In this exercise the student need not be concerned with these overhead costs.*



To simplify this grinding and blending operation, only two meat ingredients will be used for each batch.

Rounding of decimals: 5-9 will be rounded up: 1-4 will be rounded down.

For Preceding Information:



SAMPLE PROBLEM TWO

You must follow all government regulations and company policies listed in the training materials. Determine which available ingredients to use (and at what levels) to make the lowest-priced ground beef acceptable.

Specifications:

Desired fat content of finished product is 18%
Batch Size = 5,000 lbs.
Manufacturing date = February 10
No product over 5 days old may be used.
No; variety meats may be used.
No product over 35°F may be used.

Boneless Meat Ingredients Available

	Slaughter Date	Fat Temp	Cont.	Price
Bull meat	Feb.6	33°F	8%	$1.05
Boneless Chuck	Feb. 7	35°F	14%	$1.00
75% lean trim	Feb. 4	32°F	25%	$0.75
50% lean trim	Feb. 6	31°F	50%	$0.55
Beef chuck meat	Feb. 7	37°F	12%	$0.70
Beef hearts	Feb. 6	32°F	15%	$0.35

Solution:

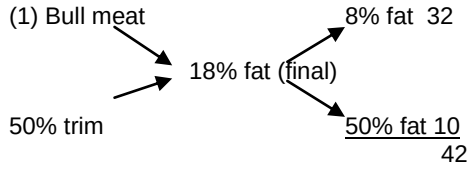
Do all potential ingredients meet government regulations and company specifications?

Acceptable	Not Acceptable
Bull meat	75% lean trim (too old)
Boneless chuck	Chuck meat (too warm)
50% lean trim	Beef hearts (not allowed)

Therefore, to produce desired fat content, product could be made from either of the following two combinations:

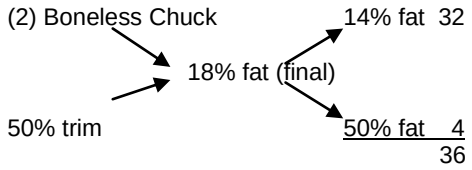
(1) Bull meat and 50% lean trim
(2) Boneless chuck and 50% lean trim

Which combination results in the lowest meat cost?



Proportions:
Bull meat = 32/42 = 0.76 or 3,800 lbs.
50% trim = 10/42 = 0.24 or 1,200 lbs.
5,000 lbs.

Costs:
Bull meat 0.76 x $1.05 = $0.798
50% trim 0.24 x $.55 = $0.132
$0.93 or $.93/lb.



Proportions:
Boneless chuck = 32/36 = 0.89 or 4.450 lbs.
50% trim = 4/36 = 0.11 or 550 lbs.
5,000 lbs.

Cost:
Bull meat 0.89 x $1.00 = $0.89
50% trim 0.11 x $.55 = $0.06
$0.95 or $.95/lb.

Final Solution --Meats to be Used:

Bull meat 3,800 lbs.
50% trim 1,200 lbs.

Meat costs: $0.93 per pound

Scoring:
The answer to the formulation problem will count ten points. There will be an additional eight questions, worth five points each. To facilitate computer scoring of this exercise, participants will be given a list of ten or more meat price combinations and be required to select the correct one, based on the above calculation. All problems will be worked to three decimal places and rounded to two places. If the third decimal is 5 or more, the number will be rounded up.

Answers to the eight additional questions will be selected from four choices.

SAMPLE TEST ITEMS FOR SAMPLE PROBLEM TWO
Check the correct solution:

1. Bull and chuck meat (0.89)
2. Boneless chuck and 75% lean trim (0.91)
3. Bull meat and 50% lean trim (0.93)
4. Boneless chuck and 50% lean trim (0.90)
5. Bull meat and 50% lean trim (0.88)
6. Beef hearts and 75% lean trim (0.68)
7. Bull meat and 50% lean trim (0.97)
8. Beef chuck meat and bull meat (1.04)
9. 75% lean trim and 50% lean trim (0.67)
10. 50% lean trim and bull meat (0.87)