

MEATS EVALUATION AND TECHNOLOGY

Effective August 1, 2006

I. OBJECTIVES

1. To develop employment skills for students who are interested in exploring or pursuing career opportunities in the meat animal industry.
2. To assist the local agricultural education instructor in motivating students to become knowledgeable consumers of meat and meat animal products and/or involved in the industry of meat animal marketing and merchandising.
3. To encourage the development of broader analytical skills, critical thinking strategies and an understanding of appropriate meat terminology for high school students.
4. To 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.
5. To develop good cooperation and communication skills in working together to accomplish

II. EVENT RULES

3. Participants will report for instructions to the event at the OSU Meats lab, at the appointed time (see email)
4. **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) clean clothing 3) hairnets 4) warm clothing and footwear. While official FFA dress is not worn during the event, it is required for all awards presentation

activities.

5. All participants are expected to be prompt at their stations throughout the event; no provision will be made for tardiness and will most certainly cause late participants to lose event points. No conversation will be allowed between participants after the event begins. (Conversation among participants constitutes disqualification.)
6. Participants and official judges are to make their placing and identifications without handling the meat.
7. Two minutes stand back time on placing classes will be utilized when possible.

III. EVENT FORMAT

A. EQUIPMENT

Materials student needs to provide: Each participant must bring two sharpened No. 2 pencils and an electronic calculator. Calculators used in the event should be battery powered, non-programmable and silent. Participants must not bring any blank paper, notes, training aids, other electronic items, purses or backpacks. Students with special needs must contact the event superintendent prior to the event.

B. INDIVIDUAL ACTIVITIES

1. **Meat Formulation Problem Solving and Written Test** Online testing prior to event
Students will complete a meat formulation problem solving exercise. An example is at the end of this section. Nine questions are to be answered using the computerized scorecard. The one solution to the meat formulation problem will be worth 10 points. The other 8 questions based on the correct formulation will be valued at 5 points each.

Each participant will be given a written test of up to 25 questions relating to meat selection, storage, cookery, nutrition and safety. All questions will be based on materials taken from Yellow Pages - Answers to Predictable Questions Consumers Ask About Meat. No questions will be taken from cooking charts or the Glossary of Better Known Sausage and Prepared Meat (located in the *Yellow Pages*). Questions will be multiple-choice using a computer scorecard. Each question will be valued at 2 points. Examples for this section of the Meats Evaluation CDE are at the end of this section.

2. Retail Meat Cuts Identification

Students will identify 40 retail meats cuts found on the "Meats Identification Card". The official key (Retail Cuts Coding - Training Aid I) is located at the end of the Meat Evaluation section of this handbook. Only the cuts listed are eligible to be used in this event. Students will be given one point for correct species identification, two points for correct primal cut identification and four points for correct retail trade name. Answers will be recorded on a computerized scorecard.

3. Placing of Six Classes

Six classes from the following list will be placed with selected placings completed on the computerized scorecard. All classes will consist of four exhibits per class.

- 1.) Beef carcasses
- 2.) Retail cuts
- 3.) Pork carcasses
- 4.) Wholesale 1 pork cuts
- 5.) Lamb carcasses
- 6.) Wholesale beef cuts

5. Questions on Placing of Two Classes and Ten Questions

Two selected classes listed in "Individual Activities, Item 3- Placing of Six Classes" will be placed. A total of ten questions will be asked covering two classes. Answers will be transferred to the appropriate computerized scorecard.

Sample Question: "Which beef carcass had the highest percentage of KPH fat?"

IV. SCORING

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

Section	Points
Written Test (up to 25 items) and Meat Formulation Problem Solving (9 items)	
Written Test	50
Meat Formulation	50
Retail Meat Cuts Identification	
40 retail cuts	280
Placing of Six Classes	
Six classes	300
..Ten Questions	100
Total per individual	780
Total per team*	2340

*(top 3 individual's scores)

V. TIEBREAKERS

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

1. Identification Retail Meat Cuts
2. Questions About Classes Score
3. Total Score Carcass Grading

VI. AWARDS

Awards will be presented at an awards ceremony. Awards are presented 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 Ohio FFA Foundation.

Customer service department for brochures and materials
1-800-368-3138

VII. REFERENCES

This list of references is not intended to be 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.

Meats Identification Tutorial CD-ROM (MID-05) \$99.00 available from the National FFA Organization 1-888-332-2668 or on line at <http://www.ffaunlimited.org/pavicdeha.html>

AMSA Meat Evaluation Handbook

AMSA Guide to Identifying Meat Cuts

USDS Marbling Photographs

Materials available from:

American Meat Science Association (AMSA)
1111 North Dunlap Avenue
Savoy, Illinois 61874
Phone: 217-356-5368
Fax: 217-398-4119
<http://www.meatscience.org/>
E-mail: info@meatscience.org

Beef Ribeye Grids

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

Preliminary Yield Grade Rulers

NASCO
901 Janesville Avenue
P.O. Box 901
Fort Atkinson, WI 53538-0901
Phone: 1-800-558-9595
Fax: 920-563-8296

Meats Evaluation Materials

CEV Multimedia
P.O. Box 65265
Lubbock, TX 79464
Phone: 1-800-922-9965

National Cattlemen's Beef Association

Example Meats Events/Classes/Materials

<http://aggiemeat.tamu.edu/judging/meatjudging.html>
<http://animalscience.unl.edu/meats/id/>
<http://www.ca.uky.edu/agripedia/agrimania.html>
<http://www.meatscience.org/judging/default.htm>

<http://www.meatscience.org/judging/Easter.htm>

Yellow Pages

American Meat Institute
P.O. Box 3556
Washington, DC 20007
Phone: 703-841-2400
Fax: 703-527-0938

VIII. EXAMPLES

Meat Formulation Problem Solving and Written Test Examples

Sample Questions:

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

- *A..... 30% C 40%
B..... 10% 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

Students 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.

Ground Beef Formulation Problem

Training Materials

Assume that you manage a meat plant that manufactures ground beef for a chain of retail stores. Your goal is to produce a fresh, wholesome product which complies with all meat inspection regulations and which 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. All problems will be worked to three decimal places and rounded to two places.

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 and tongue 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.

EXAMPLE: Utilize 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%

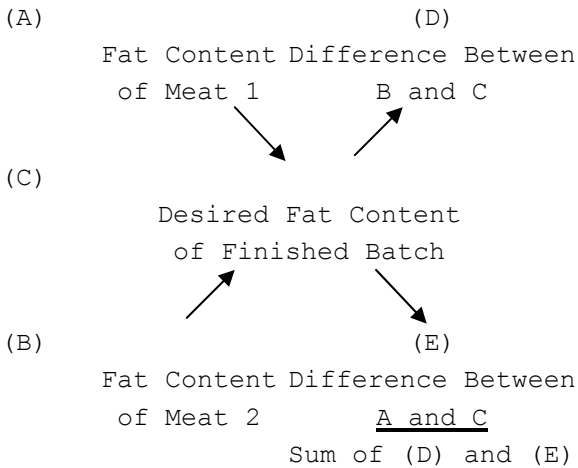
Batch Size: 1,000 lbs.

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.*

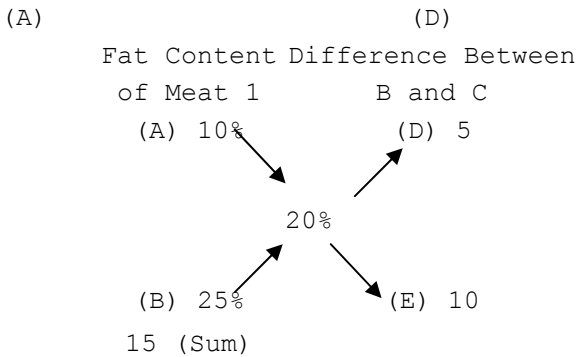
*NOTE: You will only be determining meat costs. In an actual situation overhead cost must also be added to the cost of the ground beef to account for labor, equipment, transportation, etc. In this exercise the student need not be concerned with these overhead costs.

Pearson Square



Proportion of ingredient (A) = (D)/(Sum)
 Proportion of ingredient (B) = (E)/(Sum)

For Previous Information:



Proportions:

- (1) Boneless cow = $5/15 = 0.33$
 (x 1000 lbs. = 330 lbs.)
- (2) 75% Beef trim = $10/15 = 0.67$
 (x 1000 lbs. = 670 lbs.)

Verify Final Fat Content

$$\begin{aligned}
330 \text{ lbs.} \times \xi 0.10 \text{ (fat)} &= 33 \text{ lbs.} \\
670 \text{ lbs.} \times \xi 0.25 \text{ (fat)} &= \underline{167 \text{ lbs.}} \\
&= 200 \text{ lbs. fat/} \\
&\quad 1,000 \text{ lbs. batch} \\
&\quad (20\% \text{ fat})
\end{aligned}$$

Cost per Pound

$$\begin{aligned}
\text{Boneless cow meat } 0.33 \times \$.99/\text{lb.} &= .33 \\
75\% \text{ trim } 0.67 \times \xi \$.79/\text{lb.} &= \underline{.53} \\
&= \$.86 \text{ lb.}
\end{aligned}$$

SAMPLE PROBLEM

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 = 5000 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

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

Solution:

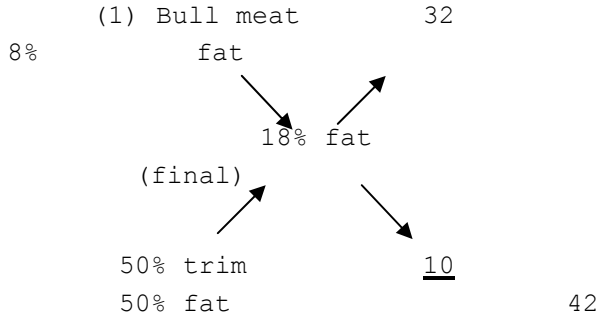
Do all potential ingredients meet government regulations and company specifications?

<i>Acceptable</i>	<i>Not Acceptable</i>
Bull meat	75% lean trim (too old)
Boneless chuck	Beef chuck (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?



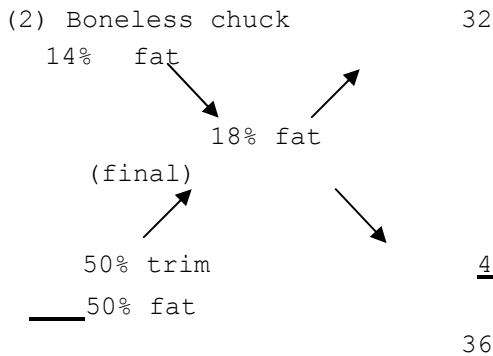
Proportions:

Bull meat = $32/42 = 0.76$ (3,800 lbs.)

50% trim = $10/42 = 0.24$ (1,200 lbs.)
5,000 lbs.

Cost:

Bull meat— $0.76 \times \xi \$1.05 = \0.798
50% trim— $0.24 \times \xi \$.55 = \underline{\$0.132}$
0.93 or
\$.93/lb.



Proportions:

Boneless chuck = $32/36 = 0.89$ (4,450 lbs.)

50% trim = $4/36 = 0.11$ (550 lbs.)
5,000 lbs.

Cost:

Bull meat— $0.89 \times \xi \$1.00 = \0.89
50% trim— $0.11 \times \xi \$.55 = \underline{\$0.06}$
\$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, the participants will be given a list of ten or more meat/price combinations, and be required to select the correct one, based upon the above calculation. Answers to the eight additional questions will be selected from four choices.

Example: 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% less 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)

Example questions: 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.

- 1. Which ingredients do not meet company temperature constraints?

Answer: Beef chuck

- 2. Which ingredients do not meet company freshness requirements?

Answer: 75% lean trim

- 3. Which ingredients do not meet government regulation\

Answer: Beef hearts

RETAIL CUTS CODING ALL BOLD EITHER NEW OR WORDED DIFFERENTLY

Primal Cuts	Retail Cut	Species	Primal	Retail
BEEF				
BRISKET	Brisket, Whole (Bnls)	B	2	11
	Brisket, Corned	B	2	102
	Flat Half (Bnls)	B	2	20
	Point Half (Bnls)	B	2	27
CHUCK	Arm Roast	B	3	3
	Arm Pot Roast (Bnls)	B	3	4
	Arm Steak	B	3	46
	Arm Steak (Bnls)	B	3	47
	Blade Roast	B	3	6
	Blade Steak	B	3	48
	Chuck Eye Roast (Bnls)	B	3	14
	Mock Tender Roast	B	3	26
	Mock Tender Steak	B	3	54
	Seven (7) Bone Roast	B	3	31
	Seven (7) Bone Steak	B	3	59
	Top Blade Steak (Bnls)	B	3	70
FLANK	Flank Steak	B	4	53
LOIN	Porterhouse Steak	B	8	56
	Sirloin Steak	B	8	60
	Sirloin Steak (Bnls)	B	8	61
	T - Bone Steak	B	8	66
	Tenderloin Roast (Whole)	B	8	40
	Tenderloin Steak	B	8	67
	Top Loin Steak	B	8	71
	Top Loin Steak (Bnls)	B	8	72
	Top Sirloin Steak (Bnls)	B	8	74
PLATE	Short Ribs	B	9	33
	Skirt Steak (Bnls)	B	9	63
BRISKET	Brisket, Whole (Bnls)	B	2	11
RIB	Eye Roast	B	10	18
	Eye Steak	B	10	51
	Large End Roast	B	10	24

	Small End Roast	B	10	37
	Small End Steak	B	10	64
	Small End Steak (Bnls)	B	10	65
ROUND	Bottom Round Roast (Bnls)	B	11	8
	Bottom Round Rump Roast (Bnls)	B	11	9
	Bottom Round Steak	B	11	49
	Eye Round Roast	B	11	19
	Eye Round Steak	B	11	52
	Heel of Round Roast	B	11	23
	Round Steak	B	11	57
	Round Steak (Bnls)	B	11	58
	Tip Roast	B	11	41
	Tip Roast, Cap Off	B	11	42
	Tip Steak	B	11	68
	Tip Steak, Cap Off	B	11	69
	Top Round Roast	B	11	45
	Top Round Steak	B	11	73
SHANK	Cross Cuts	B	12	16
	Cross Cuts (Bnls)	B	12	17
VARIETY MEATS				
	Heart	B	16	87
	Kidney	B	16	88
	Liver	B	16	89
	Oxtail	B	16	90
	Sweetbread	B	16	91
	Tongue	B	16	92
	Tripe	B	16	93
VARIOUS	Beef for Stew	B	17	94
	Cube Steak	B	17	95
	Ground Beef	B	17	96

PORK, FRESH

HAM/LEG	Center Slice	P	5	50
	Rump Portion	P	5	30
	Shank Portion	P	5	32
LOIN	Back Ribs	P	8	5
	Blade Chop	P	8	76
	Blade Chop (Bnls)	P	8	77
	Blade Roast	P	8	6
	Butterfly Chop(Bnls)	P	8	78
	Center Loin Roast	P	8	12
	Center Rib Roast	P	8	13
	Country Style Ribs	P	8	15
	Loin Chop	P	8	80
	Rib Chop	P	8	81
	Sirloin Chop	P	8	83
	Sirloin Cutlets	P	8	62
	Sirloin Roast	P	8	35
	Tenderloin Roast (Whole)	P	8	40
	Top Loin Chop	P	8	84
	Top Loin Chop (Bnls)	P	8	85
	Top Loin Roast (Bnls)	P	8	43
	Top Loin Double Roast (Bnls)	P	8	44
	SHOULDER	Arm Picnic	P	13
Arm Roast		P	13	3
Arm Steak		P	13	46
Blade, Boston		P	13	7
Blade Steak		P	13	48
SIDE "BELLY"	Fresh Side	P	14	22
SPARERIBS	Spareribs	P	15	38
VARIETY MEATS	Heart	P	16	87
	Kidney	P	16	88
	Liver	P	16	89
	Tongue	P	16	92
VARIOUS	Cube Steak	P	17	95
	Ground Pork	P	17	97
	Hocks	P	17	98

	Sausage	P	17	99
	Sausage Links	P	17	100
PORK, SMOKED/CURED				
HAM/LEG	Center Slice	P	5	104
	Ham (Bnls)	P	5	105
	Ham (Whole)	P	5	106
	Rump Portion	P	5	112
	Shank Portion	P	5	113
JOWL	Jowl	P	6	108
LOIN	Back Ribs	P	8	101
	Canadian Bacon	P	8	103
	Loin Chop	P	8	109
	Rib Chop	P	8	111
SHOULDER	Picnic (Whole)	P	13	110
SIDE "BELLY"	Slab Bacon	P	14	114
	Sliced Bacon	P	14	115
SPARERIBS	Spareribs	P	15	116
VARIOUS	Hocks	P	17	107
LAMB				
BREAST	Breast	L	1	10
	Riblets	L	1	29
LEG	American Style Roast	L	7	1
	Center Slice	L	7	50
	Frenched Style Roast	L	7	21
	Sirloin Chop	L	7	83
	Sirloin Half	L	7	36
	Shank Portion	L	7	32

LOIN	Double Chop	L	8	79
	Loin Chop	L	8	80
	Loin Roast	L	8	25
RIB	Rib Chop	L	10	81
	Rib Chop (Frenched)	L	10	82
	Rib Roast	L	10	28
SHOULDER	Arm Chop	L	13	75
	Blade Chop	L	13	76
	Neck Slice	L	13	55
	Shoulder (Bnls)	L	13	34
	Square Cut (Whole)	L	13	39
VARIETY MEATS	Heart	L	16	87
	Kidney	L	16	88
	Liver	L	16	89
	Tongue	L	16	92

Name	ID Number	Chapter	State
------	-----------	---------	-------

Select: Species (1 pt); Primal Cut (2 pts); and Retail Name (4pts from the listings below and fill in the column blanks beside the cut number. The score column is for tabulation only. Total - 280 points. Species - (1 pt) - B-Beef, P-Pork, L-Lamb

		Cut #	Species	Primal	Retail	Score
PRIMAL CUTS - 2 Points						
1. Breast	10. Rib	1.				
2. Brisket	11. Round	2.				
3. Chuck	12. Shank	3.				
4. Flank	13. Shoulder	4.				
5. Ham/Leg	14. Side "Belly"	5.				
6. Jowl	15. Spareribs	6.				
7. Leg	16. Variety Meats	7.				
8. Loin	17. Various Meats	8.				
9. Plate		9.				
RETAIL NAMES - 3 Points						
ROASTS/POT ROASTS						
1. American Style	24. Large End	10.				
2. Arm Picnic	25. Loin	11.				
3. Arm Roast	26. Mock Tender	12.				
4. Arm Pot Roast (Bnls)	27. Point Half (Bnls)	13.				
5. Back Ribs	28. Rib	14.				
6. Blade	29. Riblets	15.				
7. Blade Boston	30. Rump Portion	16.				
8. Bottom Round (Bnls)	31. Seven (7) Bone	17.				
9. Bottom Round Rump (Bnls)	32. Shank Portion	18.				
10. Breast	33. Short Ribs	19.				
11. Brisket, Whole (Bnls)	34. Shoulder (Bnls)	20.				
12. Center Loin	35. Sirloin	21.				
13. Center Rib	36. Sirloin Half	22.				
14. Chuck Eye Roast	37. Small End	23.				
15. Country Style Ribs	38. Spareribs	24.				
16. Cross Cuts	39. Square Cut (Whole)	25.				
17. Cross Cuts (Bnls)	40. Tenderloin (Whole)	26.				
18. Eye	41. Tip	27.				
19. Eye Round	42. Tip, Cap Off	28.				
20. Flat Half (Bnls)	43. Top Loin (Bnls)	29.				
21. Frenched Style	44. Top Loin Double (Bnls)	30.				
22. Fresh Side	45. Top Round	31.				
23. Heel of Round		32.				
STEAKS						
46. Arm	61. Sirloin (Bnls)	33.				
47. Arm (Bnls)	62. Sirloin Cutlets	34.				
48. Blade	63. Skirt (Bnls)	35.				
49. Bottom Round	64. Small End	36.				
50. Center Slice	65. Small End (Bnls)	37.				
51. Eye	66. T-Bone	38.				
52. Eye Round	67. Tenderloin	39.				
53. Flank	68. Tip	40.				
54. Mock Tender	69. Tip, Cap Off	41.				
55. Neck Slice	70. Top Blade (Bnls)	42.				
56. Porterhouse	71. Top Loin	43.				
57. Round	72. Top Loin (Bnls)	44.				
58. Round (Bnls)	73. Top Round	45.				
59. Seven (7) Bone	74. Top Sirloin (Bnls)	46.				
60. Sirloin		47.				
CHOPS						
75. Arm	81. Rib	48.				
76. Blade	82. Rib (Frenched)	49.				
77. Blade (Bnls)	83. Sirloin	50.				
78. Butterfly (Bnls)	84. Top Loin	51.				
79. Double	85. Top Loin (Bnls)	52.				
80. Loin		53.				
VARIETY MEATS						
87. Heart	91. Sweetbread	54.				
88. Kidney	92. Tongue	55.				
89. Liver	93. Tripe	56.				
90. Oxtail		57.				
VARIOUS MEATS						
94. Beef for Stew	98. Hocks	58.				
95. Cube Steak	99. Sausage	59.				
96. Ground Beef	100. Sausage Links	60.				
97. Ground Pork		61.				
SMOKED/CURED MEATS						

- 101. Back Ribs
- 102. Brisket, Corned
- 103. Canadian Bacon
- 104. Center Slice
- 105. Ham (Bnls)
- 106. Ham (Whole)
- 107. Hocks
- 108. Jowl

- 109. Loin Chop
- 110. Picnic (Whole)
- 111. Rib Chop
- 112. Rump Portion
- 113. Shank Portion
- 114. Slab Bacon
- 115. Sliced Bacon
- 116. Spareribs

37.				
38.				
39.				
40.				