

2003 IA FFA Meat Judging Contest  
August 23, ~~2004~~ 2003  
ID# \_\_\_\_\_

Name \_\_\_\_\_

Chapter \_\_\_\_\_

### **A. Ground Beef Formulation Problem**

Assume that you are the manager of your meat processing plant in Midtown, IA. Among other products, you manufacture ground beef for retail sale by your company. Your retail food store has strong specifications to meet its food safety and chopped beef quality standards. Your goal is to produce a fresh, wholesome product, which complies with all meat inspection, industry regulations, and retail store specifications, and meet your local consumer demands. The cost of the product must be as low as possible (least cost formulation).

#### **Ground Beef REGULATIONS (USDA) are Defined as Follows:**

**GROUND BEEF:** The term "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 not contain added water, binders, or extenders. It may contain beef cheek meat not to exceed 25%. Heat 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.

If a product is to qualify for "low fat" or "lean" labeling, the product must contain less than 10% total fat. If a product is to be labeled "extra lean," the product must contain less than 5% total fat.

#### **Industry GUIDELINES on Ground Beef Manufacture:**

To get the most desirable color and maximum shelf life, all boneless meats used to manufacture ground beef must be fresh (not frozen), well chilled (temperature no higher than 35° F), and shall arrive at the plant within 72 hours of animal slaughter. A least-cost formulation shall be performed on acceptable meat ingredients to select those meats that produce the lowest cost product, and meets all ground beef guidelines. To simplify the grinding and blending operation, *only two meat ingredients will be used for each batch.*

You must follow all government regulations and retail food store specifications listed, and you are to determine which available ingredients to used and in what amounts, to make specification ground beef in a least cost formulation process.

#### **SPECIFICATIONS of Your Retail Food Store's Ground Beef Formulation are:**

Fat content of finished product = 15%

Batch Size = 2000 lbs.

Manufacturing date = Aug. 24

No product over 4 days old may be used for grinding (from date of slaughter)

No product with a receiving temperature of over 34 degrees F may be used

Product must be received at the plant within 72 hours (3 days) of animal slaughter date

All products must be received fresh (not frozen)

Must be least cost formulated

**A. Ground Beef Formulation Problem, continued**

Available Boneless Meat Ingredients Data:

Meat Ingredients	Date Slaughtered	Date Received	Temp (F°) Received	Condition Received	Fat (%)	Protein (%)	Price/lb.
Cow Beef	8/17	8/18	34°	Fresh	10	18.5	\$1.09
Bull Beef	8/21	8/22	33°	Fresh	5	20.8	\$1.23
Boneless Round	8/22	8/24	32°	Fresh	10	16.5	\$1.09
85% Lean Trim	8/22	8/24	26°	Frozen	15	16.8	\$0.92
Beef Cheek Meat	8/22	8/24	36°	Fresh	20	16.3	\$0.78
50% Lean Trim	8/21	8/23	32°	Fresh	50	12.0	\$0.52

1. For least cost ground formulation of 80% lean ground beef, meeting all specifications of your retail store, you would use a combination of:
  - a. cow beef and 50% lean trim
  - b. bull beef and 50% lean trim
  - c. boneless round and 50% lean trim
  - d. beef cheek meat and 50% lean trim
  - e. 85% lean trim and 50% lean trim
  
2. For least cost ground beef formulation meeting your retail store specifications, use the Pearson square method to calculate the amount of meat ingredients needed in a 2000 lb. Batch of 85% lean ground beef. What would be the proportion of the two meat ingredients? (round to the nearest whole number)
  - a. 1600 and 400 lbs.
  - b. 1900 and 100 lbs.
  - c. 1750 and 250 lbs.
  
3. Price per pound (round to the nearest cent) of the least cost formulated ground beef meeting your retail store specifications would be:
  - a. \$0.99/lb
  - b. \$1.02/lb
  - c. \$0.94/lb

4. If you mark up the ground beef 34% to cover overhead costs, and make a profit for your store, you will sell (round to the nearest cent) this batch for:
- a. \$1.37/lb
  - b. \$1.34/lb
  - c. \$1.42/lb
5. The ground beef formulation would
- a. qualify as ground beef round
  - b. be labeled as chopped beef
  - c. be labeled as extra lean beef

**B. Beef Carcass Pricing Problem**

You are a cattle feeder, producing crossbred steers and heifers with predominantly black breeding, to market to a typical beef processor. You market 100 head.

*The average live weight, dressing percentage, yield and quality grades of your cattle, and pricing information are as follows:*

Average live weight            **1300 lbs., with a range of  $\pm$  100 lbs.**  
 Average dressing percentage **63.5%**  
 USDA yield grades (YG)      **50% were USDA Yield Grade (YG) 3s and 50% were YG 2s**  
   **(assume equal distribution of YGs within the three quality grades)**

USDA quality grades            **50% were USDA low Choice**  
   **28% were USDA average and high Choice**  
   **22% were USDA Select**

**USDA Carcass Quality and Yield Grades, Prices, and Adjustments/cwt**

BASE PRICE of YG 3, low Choice	= \$104/cwt
Acceptable Hot Carcass weight range	= 600 to 900 lbs.
Under 600 lbs	= deduct \$5.00/cwt from BASE PRICE
Over 900 lbs	= deduct \$1.25/cwt from BASE PRICE
YG 2 carcasses	= add \$3.20 to BASE PRICE
Average and high Choice carcasses	= add \$5.00 to BASE PRICE
Select carcasses	= deduct \$6.50 from BASE PRICE

**C. Beef Carcass Pricing Problem, continued**

1. Are you producing cattle for the correct carcass weights (no deductions)?
  - a. Yes
  - b. No
  
2. What would be the price/cwt for the average and high Choice, YG 2 and YG 3 carcasses?
  - a. \$112.20
  - b. \$110.60
  - c. \$109.00
  
3. What would be the price/cwt for the low Choice YG 2 carcasses?
  - a. \$107.20
  - b. \$100.80
  - c. \$105.60
  
4. What is the carcass price/cwt for the whole lot of 100 cattle?
  - a. \$100.90
  - b. \$103.20
  - c. \$105.60
  - d. \$107.10
  
5. What would you do to make more money on your cattle?
  - a. Increase percentage of Select
  - b. Produce market cattle with carcasses over 900 lbs.
  - c. Increase percentage of low and average Choice
  - d. Increase live weight of cattle to 1600 lbs.

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KEY:

**A. Ground Beef Formulation Problem**

1. c. Boneless round and 50% lean trim
2. c. 1750 and 250 lbs.

$$\begin{array}{r} 10\% \qquad 35 \\ \boxed{15\%} \\ 50\% \qquad 5 \\ \hline 40 \end{array}$$

$$35/40 = .875 \times 2 = 1750$$

$$5/40 = .125 \times 2 = 250$$

3. b. \$1.02/lb

$$\begin{array}{r} 1750/2000 (1.09) + 250/2000 (.52) \\ .95 \qquad + \qquad .065 \\ = 1.02 \end{array}$$

4. a. \$1.37/lb

$$1.34 \times 1.02 = 1.37$$

5. b. be labeled as chopped beef

**B. Beef Carcass Pricing Problem**

1. a. Yes
2. b. \$110.60

$$104 + 5 + \frac{1}{2} (3.20) = 110.60$$

3. a. \$107.20

$$104 + 3.20 = 107.20$$

4. c. \$105.60

$$.22[(104 - 6.50) + \frac{1}{2}(3.20)] + .28[(104 + 5) + \frac{1}{2}(3.20)] + .5[104 + \frac{1}{2}(3.20)] = 105.60$$
$$21.80 \quad + \quad 30.97 \quad + \quad 52.80 \quad = 105.60$$

5. c. Increase percentage of low and average Choice

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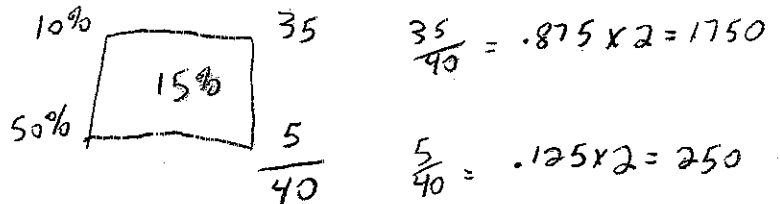
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- d. beef cheek meat and 50% lean trim ✗
- e. 85% lean trim and 50% lean trim ✗

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- a. \$0.99/lb
- b. \$1.02/lb
- c. \$0.94/lb

$$\frac{1750}{2000} (1.09) + \frac{250}{2000} (.52) = .95 + .065 = 1.02$$



4. If you mark up the ground beef 34% to cover overhead costs, and make a profit for your store, you will sell (round to the nearest cent) this batch for:

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- b. \$1.34/lb
- c. \$1.42/lb

$$1.34 \times 1.02 = 1.37$$

5. The ground beef formulation would

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**B. Beef Carcass Pricing Problem, continued**

Q1. Are you producing cattle for the correct carcass weights (no deductions)?

- a. Yes
- b. No

Q2. What would be the price/cwt for the average and high Choice, YG 2 and YG 3 carcasses?

- a. \$112.20
- b. \$110.60
- c. \$109.00

$$104 + 5 + \frac{1}{2}(3.20) = 110.60$$

Q3. What would be the price/cwt for the low Choice YG 2 carcasses?

- a. \$107.20
- b. \$100.80
- c. \$105.60

$$104 + 3.20 = 107.20$$

Q4. What is the carcass price/cwt for the whole lot of 100 cattle?

- a. \$100.90
- b. \$103.20
- c. \$105.60
- d. \$107.10

$$.22 [(104 - 6.50) + \frac{1}{2}(3.20)] + .28 [(104 + 5) + \frac{1}{2}(3.20)] + .5 [104 + \frac{1}{2}(3.20)] = 105.60$$

(21.80)
(30.97)
(52.80)

Q5. What would you do to make more money on your cattle?

- a. Increase percentage of Select ~~x~~
- b. Produce market cattle with carcasses over 900 lbs ~~x~~
- c. Increase percentage of low and average Choice
- d. Increase live weight of cattle to 1600 lbs.