

Name _____ Chapter _____

ID # _____

A. Ground Beef Formulation Problem

Assume that you manage a company which manufactures ground beef for retail food stores. This particular retail food store has strong specifications to meet its ground beef quality and food safety standards. Your goal is to produce a fresh, wholesome product which complies with all industry regulations, meat inspections, and retail store specifications. The fat content and all other specifications must comply with the specifications of the retail food store. 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 terms "Ground Beef" and "Chopped Beef" are synonymous. Products so labeled must be made with fresh and/or frozen beef with or without seasoning, 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%. Heart meat and tongue meat are not acceptable ingredients.

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

If a product is to qualify for "lean" or "low fat" 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 for 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 harvest. A least-cost formulation shall be calculated using acceptable meat ingredients, selecting those meats that produce the lowest cost product, while meeting all ground beef guidelines. To simplify the grinding and blending operation **only two meat ingredients will be used for each batch**. In order to make specification ground beef in a least-cost formulation process, you must determine what available ingredients to use in what amounts. All government regulations and retail food store specifications must be followed.

Specifications of your retail food store's ground beef formulation are:

- Fat content of finished product = 20%
- Batch Size = 2500 lbs.
- Manufacturing date = August 31
- No product over 4 days old may be used for grinding (from date of harvest).
- No product with a receiving temperature of over 35° F may be used.
- Product must be received at the plant within 72 hours (3 days) of animal harvest date.
- All products must be received fresh, not frozen.
- Must be least-cost formulated.

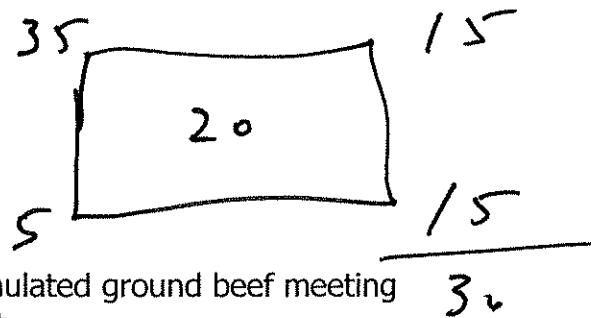
Available Boneless Meat Ingredient Information:

Meat Ingredients	Date Slaughtered	Date Received	Receiving Temperature (°F)	Condition Received	Fat (%)	Protein (%)	Price/lb.
50% Lean Trim	8/27	8/29	37°	Fresh	50	11.0	\$0.76
65% Lean Trim	8/28	8/31	34°	Fresh	35	12.0	\$1.00
Beef Cheek Meat	8/26	8/28	34°	Fresh	15	17.0	\$0.93
Boneless Chuck	8/29	8/31	35°	Fresh	25	19.5	\$1.55
Boneless Round	8/28	8/30	33°	Fresh	5	16.5	\$1.78
Cow Beef	8/28	8/31	33°	Frozen	10	18.5	\$0.92

1. For least-cost formulation of 80% ground beef meeting all specifications of your retail store you would use a combination of:
 - a. 50% lean trim and boneless chuck
 - b. 65% lean trim and beef cheek meat
 - c. Boneless chuck and boneless round
 - d. 65% lean trim and boneless round
 - e. 65% lean trim and cow beef

2. For a 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 2500 pound batch of 80% ground beef. What would be the proportion of the two meat ingredients? Round to the nearest whole number.

- a. 1875 lbs. and 625 lbs.
- b. 2150 lbs. and 350 lbs.
- c. 1250 lbs. and 1250 lbs.
- d. 1000 lbs. and 1500 lbs.



3. What would be the price per pound of the least-cost formulated ground beef meeting your retail store specifications? Round to the nearest cent.

- a. \$1.41/lb.
- b. \$0.95/lb.
- c. \$1.39/lb.
- d. \$1.44/lb.

125

4. If you mark up the ground beef 30% to cover overhead costs and make a profit for your store you will sell this batch for (round to the nearest cent):
- a. \$1.24/lb.
 - b. \$1.83/lb.
 - c. \$1.88/lb.
 - d. \$1.81/lb.
5. The ground beef formulation would:
- a. be labeled as "low fat" beef
 - b. be labeled as ground beef
 - c. qualify as ground chuck
 - d. qualify as ground beef round

B. Beef Carcass Pricing Problem

You are a cattle producer in northwest Iowa who retains ownership of your cattle until the cattle are harvested. You are paid for your cattle on a value-based pricing system that depends on carcass weight, quality grades, and yield grades. You have recently marketed a **150 head** lot of cattle.

The average live weight, dressing percentage, yield grades, quality grades, and pricing information of the 150 head lot are as follows:

Average live weight: 1280 lbs.
 Average dressing percent: 61%
 USDA Yield Grade (YG): 60% were USDA YG 2's
 40% were USDA YG 3's
 *Assume equal distribution of yield grades within the three quality grades.

USDA Quality Grade (QG): 15% were USDA average or high Choice
 60% were USDA low Choice
 25% were USDA Select

USDA carcass yield and quality grades, prices, and adjustments/cwt.:

Base Price of YG3 low Choice = \$140/cwt.

Acceptable hot carcass weight range	= 600 to 900 lbs.
Under 600 lbs.	= deduct \$10.20/cwt. from base price
Over 900 lbs.	= deduct \$2.30/cwt. from base price
YG 2 carcasses	= add \$3.00/cwt. to base price
Average and high Choice carcasses	= add \$3.90/cwt. to base price
Select carcasses	= deduct \$4.90/cwt. from base price

1. Are you producing cattle with average carcass weights within the acceptable range (no discounts)?

- a. Yes
- b. No

2. What would be the price/cwt. of the average and high Choice yield grade 2 carcasses you produced?

- a. \$140.00/cwt.
- b. \$143.90/cwt.
- c. \$143.00/cwt.
- d. \$146.90/cwt.

3. What would be the price/cwt. of the USDA Select yield grade 3 carcasses you produced?

- a. \$144.90/cwt.
- b. \$140.00/cwt.
- c. \$135.10/cwt.
- d. \$147.90/cwt.

4. What is the average price/cwt. for your whole lot of 150 cattle?

- a. \$141.16/cwt.
- b. \$142.66/cwt.
- c. \$139.67/cwt.
- d. \$140.86/cwt.

5. What would be the best strategy to increase the value of your cattle?

- a. decrease the percentage of average and high Choice yield grade 2 carcasses
- b. decrease the percentage of USDA Select yield grade 3 carcasses
- c. decrease carcass size
- d. increase carcass size

2010 Official

State FFA Meats Judging Contest
 ISU Meat Laboratory
 August 28, 2010

Beef Carcass Yield Grading

Carcass	PYG/Adj.	HCW	REA	KPH%	Yield Grade
1	2.5	860	17.2	2.5	1.2
2	3.0	877	13.7	3.0	2.9
3	3.8/4.0	890	16.8	2.5	3.0
4	3.3/3.4	870	14.2	2.0	3.1
5	3.3	890	10.4	2.5	3.5

Beef Carcass Quality Grading

Carcass	Marbling	Skeletal Maturity	Lean Maturity	Overall Maturity	Quality Grade
1	Slight 60	A	A	A	Select +
2	Modest 50	A	A	A	Choice ^o
3	Modest 80	A	A	A	Choice ^o
4	Modest 70	A	A	A	Choice ^o
5	Small 0	A	A	A	Choice ^o

2010 Iowa FFA Meats CDE Beef Quality & Yield Grading

2010
Official

Contestant
Number

2631

Contestant
Name

Mike Knight, North Polk
FFA Chapter at Allaman

Beef Yield Grading

Carcass No.	No. 1					No. 2					No. 3					No. 4					No. 5				
	High	Avg.	Low	High	Avg.	Low	High	Avg.	Low	High	Avg.	Low	High	Avg.	Low	High	Avg.	Low	High	Avg.	Low	High	Avg.	Low	
1	High	B	C	D	E	F	G	H	I	J	K	L	M	N	O										
2	A	B	C	D	E	Low	G	H	I	J	K	L	M	N	O										
3	A	B	C	D	E	F	High	H	I	J	K	L	M	N	O										
4	A	B	C	D	E	F	High	H	I	J	K	L	M	N	O										
5	A	B	C	D	E	F	G	High	I	J	K	L	M	N	O										

Beef Quality Grading

Carcass No.	PRIME			Choice			Select			Standard			Commercial			Commercial			SCORE
	High	Avg.	Low	High	Avg.	Low	High	Low	High	Avg.	Low	High	Avg.	Low	High	Avg.	Low		
1	A	B	C	D	E	F	High	H	I	J	K	L	M	N	O	P	Q		
2	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q		
3	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q		
4	A	B	C	D	High	F	G	H	I	J	K	L	M	N	O	P	Q		
5	A	B	C	D	E	Low	G	H	I	J	K	L	M	N	O	P	Q		