

FFA Milk Quality and Products Exam 2019

Part I. There is ONE correct response per question. Fill in the answer form with your response.

1. To ensure that antibiotics do not inadvertently get into the fluid milk supply, milk is tested:
 - a. Before being transferred from the bulk tank to the tanker truck
 - b. Before being transferred from the tanker truck to the processing plant
 - c. Before packaged milk is shipped to grocery stores
 - d. All of the above

2. Greek yogurt is similar to regular yogurt, but:
 - a. Contains more protein per gram of product
 - b. Contains more water per gram of product
 - c. Contains more sugar per gram of product
 - d. All of the above

3. Modern robotic milking machines:
 - a. Clean and sanitize cows' teats
 - b. Can reduce labor costs at the farm
 - c. Tend to increase milking frequency
 - d. All of the above

4. The body of science indicates that eating nutritious dairy foods — such as milk, cheese and yogurt...
 - a. improves bone health, especially in children and adolescents.
 - b. is associated with a reduced risk of cardiovascular disease
 - c. is associated with a reduced risk of Type 2 diabetes
 - d. all of the above

5. Which of the following are student programs supported by Midwest Dairy (see <https://www.midwestdairy.com/>)?
 - a. Dairy Ambassador
 - b. Dairy Princess
 - c. Scholarships
 - d. All of the above

6. Which of the following are TRUE about ultrafiltered milk?
 - a. It contains more protein than conventional milk
 - b. It contains more lactose than conventional milk
 - c. It contains less fat than conventional milk
 - d. All of the above

7. Hormones are naturally present in:
 - a. Humans
 - b. Animals
 - c. Plants
 - d. All of the above

8. Which of the following is true about 1% milk
 - a. It is the same as lowfat milk
 - b. Vitamins A and D are added to replace the fat-soluble vitamins lost when the fat is removed
 - c. It naturally contains the same 9 essential nutrients as whole milk
 - d. All of the above

9. Which of the following are fermented dairy products?
 - a. Sweet cream butter
 - b. Lactose free milk
 - c. Kefir
 - d. All of the above

10. Unlike pasteurized milk, raw milk may naturally contain the following:
 - a. Riboflavin
 - b. Niacin
 - c. *E. coli*
 - d. All of the above

11. Organic milk and Conventional milk:
 - a. Contain nine essential nutrients for humans
 - b. Are not considered a good source of omega-three fatty acids
 - c. Are produced under strict practices for safety
 - d. All of the above

12. A2 milk is...
 - a. lactose free
 - b. not from cows
 - c. from cows that only carry the A2 form of beta-casein
 - d. not sold in the U.S.

13. The protein in milk that forms curds when coagulated to produce cheese is:
 - a. Rennet
 - b. Whey proteins
 - c. Lactose
 - d. Casein

14. Raw milk...
 - a. is nutritionally better than pasteurized milk
 - b. is the same as organic milk
 - c. is lactose free
 - d. may contain hazardous bacteria

15. An 8-ounce glass of milk provides 16% of the daily value of protein, which primarily helps to:
 - a. build and repair muscle tissue, and serves as a source of energy
 - b. maintain normal vision and skin
 - c. strengthen bones and generates energy in your body's cells
 - d. regulate the body's fluid balance and helps maintain normal blood pressure

16. According to the Food and Nutrition Board of the National Academy of Sciences, all people need at least _____ mg of calcium per day.
- 500
 - 1,000
 - 1,500
 - 2,000
17. An 8-ounce glass of milk provides 11% of the daily value of potassium, which helps to:
- build and repair muscle tissue, and serves as a source of energy
 - maintain normal vision and skin
 - strengthen bones and generates energy in your body's cells
 - regulate the body's fluid balance and helps maintain normal blood pressure
18. Some researchers estimate that up to 55% of adolescents may be deficient in _____, putting them at increased risk for debilitating bone diseases. Milk is the leading source of this vitamin:
- Vitamin C
 - Vitamin D
 - Folic acid
 - Thiamin
19. Which ONE of the following statements is true?
- Scientific studies do not support a link between early puberty and consumption of milk
 - Soy beverages provide equivalent nutrition as cow milk
 - Rice beverages provide equivalent nutrition as cow milk
 - Almond beverages provide equivalent nutrition as cow milk
20. Which of the following is NOT true about dairy and non-dairy beverages?
- Rice beverages have more calories per 8-oz glass than lowfat cow's milk because of nearly double the sugar
 - Lowfat cow's milk and almond beverages naturally contain at least 10% of the daily value of 6 essential vitamins and minerals
 - Lowfat cow's milk and soy beverages contain about 8 g protein per 8-oz serving
 - Almond, coconut and rice beverages contain about 1 g protein per 8-oz serving
21. Dairy cows are treated with antibiotics for all of these reasons EXCEPT:
- To promote growth
 - Only when they are necessary to treat and cure an illness
 - For a prescribed period of time to treat a specific illness
 - And milk from those cows does not make it into the food supply
22. Which of the following is an example of an unripened cheese?
- Cheddar
 - Parmesan
 - Asiago
 - Queso Fresco

23. Some people try to claim that you can get as much calcium by consuming spinach, but you would have to eat 30 cups of spinach to equal the calcium in:
- One cup of fat-free milk
 - Two cups of fat-free milk
 - Three cups of fat-free milk
 - A half-gallon of fat-free milk
24. Research has shown that drinking milk after exercise can be as effective as some sports drinks in helping the body do all of the following, EXCEPT:
- Reduce muscle damage
 - Replace fluids
 - Rebuild muscle
 - Rest
25. If a person is lactose intolerant, she or he may be able to comfortably consume all of the following dairy products, EXCEPT:
- Aged cheeses
 - Creamed cottage cheese
 - Greek yogurt
 - Fairlife milk
26. If a person is allergic to cow milk, she or he may be able to comfortably consume:
- Aged cheeses
 - Goat milk
 - Greek yogurt
 - Lactaid® milk
27. The maximum amount of fat in reduced fat milk is:
- 1%
 - 2%
 - 3.25%
 - 5%
28. Frozen yogurt:
- Can only contain all-natural ingredients
 - Is essentially pure yogurt, but frozen
 - Is much more healthy than ice cream
 - Typically has lower fat but higher sugar than ice cream
29. Regarding chocolate milk, all of the following are true, EXCEPT:
- It gives children more calcium without increasing fat and added sugars.
 - It provides children with three of the five nutrients that fall short in children's diets.
 - It causes hyperactivity in children.
 - It contains the same nine essential nutrients as white milk.

30. The microbial standard for Grade 'A' raw milk from a single farm is less than _____ total aerobic bacteria per milliliter of milk.
- 50,000
 - 100,000
 - 300,000
 - 750,000

For questions 31 – 40, observe Tables 1, 2 and 3, from the CHEESE REPORTER August 23, 2019 issue (figures included).

Table 1. Total cow milk production (in millions of lbs), % change and change in cow numbers (in 1,000 head), by state, year to date July 2018 and 2019.

| STATE | July 2018 | July 2019 | % Change | Change Cows |
|--------------|-----------|-----------|----------|-------------|
| California | 3295 | 3378 | 2.5 | -6000 |
| Wisconsin | 2631 | 2606 | -1.0 | -6000 |
| Idaho | 1327 | 1355 | 2.1 | 10000 |
| New York | 1284 | 1288 | 0.3 | 5000 |
| Texas | 1103 | 1167 | 5.8 | 27000 |
| Michigan | 948 | 954 | 0.6 | 2000 |
| Minnesota | 841 | 849 | 1.0 | -5000 |
| Pennsylvania | 900 | 832 | -7.6 | -35000 |
| New Mexico | 702 | 696 | -0.9 | -5000 |
| Washington | 580 | 581 | 0.2 | 1000 |
| Ohio | 467 | 439 | -6.0 | -14000 |
| Iowa | 439 | 436 | -0.7 | -3000 |
| Arizona | 390 | 364 | -6.7 | -13000 |
| Colorado | 392 | 415 | 5.9 | 10000 |
| Indiana | 348 | 331 | -4.9 | -9000 |
| Kansas | 313 | 316 | 1.0 | 2000 |
| South Dakota | 230 | 236 | 2.6 | 2000 |
| Vermont | 225 | 228 | 1.3 | -1000 |
| Oregon | 217 | 221 | 1.8 | 2000 |
| Florida | 188 | 186 | -1.1 | -4000 |
| Utah | 202 | 193 | -4.5 | -4000 |
| Georgia | 143 | 147 | 2.8 | 1000 |
| Illinois | 155 | 143 | -7.7 | -8000 |
| Virginia | 134 | 119 | -11.2 | -9000 |

millions of pounds 1,000 head

Table 2. Average retail prices for conventional dairy products, by region, year to date August 23, 2019.

| RETAIL PRICES - CONVENTIONAL DAIRY - AUGUST 23 | | | | | | | |
|--|------|------|------|------|------|------|-------|
| Commodity | US | NE | SE | MID | SC | SW | NW |
| Butter 1# | 3.40 | 3.50 | 3.00 | NA | 2.41 | NA | 4.64 |
| Cheese 8 oz block | 2.17 | 2.33 | 2.13 | 1.95 | 1.92 | 3.00 | 1.99 |
| Cheese 1# block | 3.16 | NA | 2.99 | 2.99 | 2.99 | 4.99 | NA |
| Cheese 2# block | 6.26 | NA | NA | NA | NA | 4.99 | 7.49 |
| Cheese 8 oz shred | 2.41 | 2.30 | 2.43 | 2.12 | 2.39 | 3.00 | 2.50 |
| Cheese 1# shred | 3.22 | 3.35 | 2.99 | NA | NA | NA | NA |
| Cottage Cheese | 2.10 | 2.23 | 2.02 | 1.79 | 2.00 | NA | NA |
| Cream Cheese | 1.75 | 2.01 | 1.72 | 1.55 | 1.56 | NA | 1.99 |
| Flavored Milk ½ gallon | 2.89 | NA | 3.00 | 2.50 | NA | NA | NA |
| Flavored Milk gallon | 4.62 | NA | NA | 4.62 | NA | NA | NA |
| Ice Cream 48-64 oz | 2.92 | 2.77 | 2.22 | 2.96 | 3.98 | 3.16 | 2.34 |
| Milk ½ gallon | 2.30 | 4.49 | 2.72 | .99 | .99 | NA | NA |
| Milk gallon | 2.53 | NA | NA | NA | NA | 2.67 | 1.99 |
| Sour Cream 16 oz | 1.92 | 1.97 | 1.94 | 1.86 | 1.71 | 1.99 | 1.700 |
| Yogurt (Greek) 4-6 oz | .97 | .95 | .99 | .90 | .98 | 1.00 | 1.00 |
| Yogurt (Greek) 32 oz | 4.02 | 4.27 | 3.69 | NA | NA | NA | NA |
| Yogurt 4-6 oz | .51 | .51 | .58 | .44 | .37 | .50 | .51 |
| Yogurt 32 oz | 2.50 | 2.50 | NA | 2.50 | NA | NA | NA |

US: National **Northeast (NE):** CT, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT;
Southeast (SE): AL, FL, GA, MD, NC, SC, TN, VA, WV; **Midwest (MID):** IA, IL, IN, KY, MI, MN, ND, NE, OH, SD, WI; **South Central (SC):** AK, CO, KS, LA, MO, NM, OK, TX; **Southwest (SW):** AZ, CA, NV, UT; **Northwest (NW):** ID, MT, OR, WA, WY

Table 3. Average retail prices for Certified Organic dairy products in the U.S., year to date August 23, 2019.

| ORGANIC DAIRY - RETAIL OVERVIEW | | | |
|--|--------|----------------------|--------|
| National Weighted Retail Avg Price: | | Greek Yogurt 4-6 oz: | NA |
| Butter 1 lb: | \$6.99 | Greek Yogurt 32 oz: | \$2.99 |
| Cheese 8 oz shred: | \$3.79 | Milk ½ gallon: | \$3.90 |
| Cream Cheese 8 oz: | \$2.71 | Milk gallon: | \$5.79 |
| Yogurt 4-6 oz: | NA | Milk UHT 8 oz: | \$1.00 |
| Yogurt 32 oz: | NA | Sour Cream 16 oz: | \$2.99 |

31. Which of the following states saw the largest decline in cows between July 2018 and 2019?
- Arizona
 - Iowa
 - Pennsylvania
 - Virginia
32. Which of the following states saw the largest decline in milk production, in %, between July 2018 and 2019?
- Arizona
 - Iowa
 - Pennsylvania
 - Virginia
33. Which of the following states saw the largest decline in milk production, in lbs, between July 2018 and 2019?
- Arizona
 - Iowa
 - Pennsylvania
 - Virginia
34. Which of the following states lost the same number of cows as decrease in pounds of milk, between July 2018 and 2019?
- Arizona
 - Iowa
 - Pennsylvania
 - Virginia
35. If the loss in milk produced in Iowa between July 2018 and 2019 was entirely ORGANIC, intended for $\frac{1}{2}$ gallons, approximately what loss in retail value would that have been? (NOTE: Assume a gallon of milk weighs 8.5 pounds)
- \$33,450
 - \$699,000
 - \$2,753,000
 - \$11,970,000
36. If the loss in milk produced in Iowa between July 2018 and 2019 was entirely CONVENTIONAL, unflavored milk intended for $\frac{1}{2}$ gallons sold in the Midwest region, approximately what loss in retail value would that have been? (NOTE: Assume a gallon of milk weighs 8.5 pounds)
- \$33,450
 - \$699,000
 - \$2,970,000
 - \$11,970,000

37. Which of the following regions charged the highest average retail price for CONVENTIONAL 8 oz packages of shredded cheese?
- NE
 - MID
 - SW
 - NW
38. Considering the average retail price for 32 oz container of ORGANIC Greek yogurt, what is the price PER OUNCE?
- \$0.04
 - \$0.09
 - \$0.51
 - \$0.97
39. Considering the overall U.S. market, which is the most affordable (cheapest) COST PER OUNCE of the CONVENTIONAL yogurt options listed below:
- 4 - 6 oz yogurt
 - 32 oz yogurt
 - 4 - 6 oz Greek yogurt
 - 32 oz Greek yogurt
40. Considering the overall U.S. Conventional and Organic retail price, which is the most EXPENSIVE COST PER OUNCE of the options listed below:
- Conventional 4 - 6 oz Greek yogurt
 - Conventional 4 – 6 oz yogurt
 - Conventional 32 oz yogurt
 - Organic 32 oz Greek yogurt

YOU HAVE COMPLETED THE TEST

FFA Milk Quality and Products Written Exam 2019 KEY

- | | |
|------|-------|
| 1. D | 31. C |
| 2. A | 32. D |
| 3. D | 33. C |
| 4. D | 34. B |
| 5. D | 35. C |
| 6. A | 36. B |
| 7. D | 37. C |
| 8. D | 38. B |
| 9. C | 39. B |
| 10.D | 40. A |
| 11.D | |
| 12.C | |
| 13.D | |
| 14.D | |
| 15.A | |
| 16.B | |
| 17.D | |
| 18.B | |
| 19.A | |
| 20.B | |
| 21.A | |
| 22.D | |
| 23.C | |
| 24.D | |
| 25.B | |
| 26.B | |
| 27.B | |
| 28.D | |
| 29.C | |
| 30.B | |

2019 Iowa FFA Milk Quality & Products CDE

Problem Solving Part 1 & Part 2

Chapter: _____

Chapter Number: _____

Team Member Names: _____

Part 1 (2 pts. Each)

- Complete **Table 1**, then submit, and pick up a **Table 1 KEY** to utilize in completing the problems in Part 2.
(see Table 1 and write answers on the sheet labeled **Problem Solving Part 1**)
- For calculations purposes on part 2, use the following information:

- | |
|---|
| <ul style="list-style-type: none">○ Milk weighs 8.5 pounds per gallon○ 10 pounds of milk are needed to make 1 pound of cheese○ 21 pounds of milk are needed to make 1 pound of butter |
|---|

Part 2

Neatly write the answer to each of the following questions on the designated line. (If the judges cannot easily read an answer, the answer will receive zero points.)

1. Based on the component prices in **Table 1**, what is the value of 100 pounds of milk at 3.6% milkfat, 2.8% protein, 5.2% other solids and 180,000 SCC?

(4 pts.)

2. If a grocery store sells milk for \$3.44 per gallon, what price are they charging per hundredweight?

(4 pts.)

3. Use the information in **Table 1** to calculate the weighted average somatic cell count for a herd of three cows. The herd includes cows **4**, **9**, and **12**.

(4 pts.)

4. A dairy producer shipped 1.75 million pounds of milk in August. Using the butterfat component price in **Table 1**, how much more valuable would the milk had been if the herd produced 0.14% more butterfat?

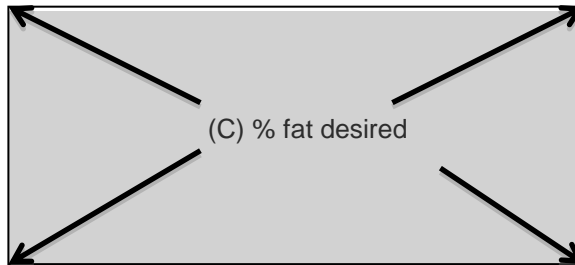
(4 pts.)

A cheddar cheese producer plans to standardize milk to 5.00% fat prior to cheese making. First, the raw milk must be separated into cream and skim milk. The separation process yields fresh cream of 35% fat and skim milk with 0.05% fat.

The Pearson Square (below) can be used to determine, for a given volume of milk, how much cream and skim milk must be combined to attain a desired fat content.

(A) % fat in cream

difference of B minus C (D parts)



(B) % fat in skim milk

difference of A minus C (E parts)

 Sum of (D) + (E) = (X)

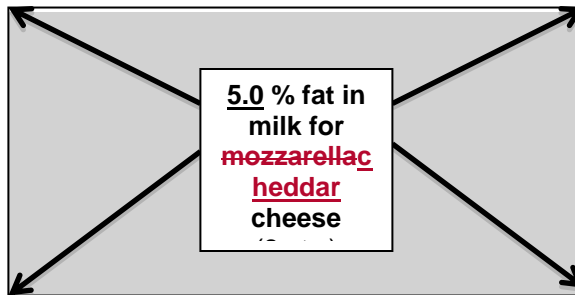
For a given volume of milk (Y), you need: (D) parts cream and (E) parts skim milk for (C) % fat milk.

For Y lb of milk at the desired fat content, you need: $(Y / X) * C = \text{lb cream}$ and $Y - \text{lb cream} = \text{lb skim milk}$

5. Use the information provided above and the Pearson Square below to calculate how much cream and skim milk must be combined to make 2500 lb of 5.0% fat milk. Complete the Pearson Square below for 12 points.

____ % fat in cream
 (2 pts.)

B minus C = ____ parts
 (2 pts.)



____ % fat in skim milk
 (2 pts.)

A minus C = ____ parts
 (2 pts.)

 Sum of (D) + (E) = ____
 (2 pts.)

6. Using the information you entered for question 5, in order to have 2,500 lbs. of milk to make mozzarellacheddar cheese at the desired fat content. How much cream and how much skim milk will you need?

____ lbs of cream (4 pts.) and ____ lbs of skim milk (4 pts.)

7. Approximately how many pounds of cheddar cheese will you end up with from the above 2,500 lbs of milk?

(2 pts.)

8. During one week (7 days), **cows 2, 6, 8, and 11** could produce an estimated total of ____ gallons of milk?

(4 pts.)

9. Using the information in **Table 1**, using the same cows from question 8, how much value above feed cost are produced by these four cows in one week?

(2 pts.)

10. Using component pricing in **Table 1**, what is the value of butterfat and protein produced by **cow 6** in one week?

_____ **value of butter fat** (2 pts.)

_____ **value of protein** (2 pts.)

11. Using component pricing in **Table 1**, based on value of milk produced after feed cost, which cow should be culled from the herd?

(2 pts.)

2019 Iowa FFA Milk Quality & Products CDE

Problem Solving Part 1 & Part 2

Chapter: _____ **KEY** _____ Chapter Number: _____ **KEY** _____

Team Member Names: _____ **KEY** _____ **KEY** _____

Part 1 (2 pts. Each)

- Complete **Table 1**, then submit, and pick up a **Table 1 KEY** to utilize in completing the problems in Part 2.
(see Table 1 and write answers on the sheet labeled **Problem Solving Part 1**)
- For calculations purposes on part 2, use the following information:

- Milk weighs 8.5 pounds per gallon
- 10 pounds of milk are needed to make 1 pound of cheese
- 21 pounds of milk are needed to make 1 pound of butter

Part 2

Neatly write the answer to each of the following questions on the designated line. (If the judges cannot easily read an answer, the answer will receive zero points.)

1. Based on the component prices in **Table 1**, what is the value of 100 pounds of milk at 3.6% milkfat, 2.8% protein, 5.2% other solids and 180,000 SCC?

$$100 * .036 * 2.8473 = \$10.25028$$

$$100 * .028 * 1.7485 = \$4.8958$$

$$100 * .052 * 0.2158 = \$1.12216$$

$$(350,000 - 180,000)/1000 * 0.00081 = \$0.1377$$

$$\text{Add all four totals together} = \$16.40594$$

\$16.40 to 16.42 (4 pts.)

2. If a grocery store sells milk for \$3.44 per gallon, what price are they charging per hundredweight?

$$\$3.44/8.5*100 = \$40.47$$

\$40.47 to \$41.00 per hundred weight (4 pts.)

3. Use the information in **Table 1** to calculate the weighted average somatic cell count for a herd of three cows. The herd includes cows **4**, **9**, and **12**.

$$62 + 48 + 83 = 193$$

$$62/193 = .321$$

$$48/193 = .249$$

$$83/193 = .430$$

$$.321*1,750,000 = 561,750$$

$$.249*110,000 = 27,390$$

$$.430*1,250,000 = 537,500$$

$$561,750 + 27,390 + 537,500 = \underline{1,126,640}$$

Herd Average SCC: **1,126,640** cells/ml (4 pts.)

4. A dairy producer shipped 1.75 million pounds of milk in August. Using the butterfat component price in **Table 1**, how much more valuable would the milk had been if the herd produced 0.14% more butterfat?

$$1,750,000 * 0.0014 * 2.8473 = \underline{\$6,975.89}$$

\$\$6,975.89 (4 pts.)

A cheddar cheese producer plans to standardize milk to 5.00% fat prior to cheese making. First, the raw milk must be separated into cream and skim milk. The separation process yields fresh cream of 35% fat and skim milk with 0.05% fat.

The Pearson Square (below) can be used to determine, for a given volume of milk, how much cream and skim milk must be combined to attain a desired fat content.

(A) % fat in cream

difference of B minus C (D parts)



(B) % fat in skim milk

difference of A minus C (E parts)

Sum of (D) + (E) = (X)

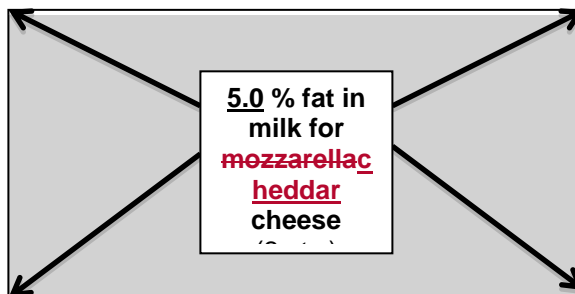
For a given volume of milk (Y), you need: (D) parts cream and (E) parts skim milk for (C) % fat milk.

For Y lb of milk at the desired fat content, you need: $(Y / X) * C = \text{lb cream}$ and $Y - \text{lb cream} = \text{lb skim milk}$

5. Use the information provided above and the Pearson Square below to calculate how much cream and skim milk must be combined to make 2500 lb of 5.0% fat milk. Complete the Pearson Square below for 12 points.

35.0% fat in cream
(2 pts.)

B minus C = 4.95 parts
(2 pts.)



0.05% fat in skim milk
(2 pts.)

A minus C = 30.0 parts
(2 pts.)

Sum of (D) + (E) = 34.95
(2 pts.)

6. Using the information you entered for question 5, in order to have 2,500 lbs. of milk to make mozzarella cheddar cheese at the desired fat content. How much cream and how much skim milk will you need?

$$\text{skim milk: } 30.0/34.95 * 2500 = \underline{2,145.92 \text{ lbs.}}$$

$$\text{cream: } 4.95/34.95 * 2500 = \underline{354.08 \text{ lbs.}}$$

354.08 lbs of cream (4 pts.) and 2,145.92 lbs of skim milk (4 pts.)

7. Approximately how many pounds of cheddar cheese will you end up with from the above 2,500 lbs of milk?

$$2,500/10 = \underline{250}$$

250 lbs of cheddar cheese (2 pts.)

8. During one week (7 days), **cows 2, 6, 8, and 11** could produce an estimated total of ____ gallons of milk?

$$72+98+47+108 = 325 * 7 = 2,275/8.5 = \underline{267}$$

267 gallons (4 pts.)

9. Using the information in **Table 1**, using the same cows from question 8, how much value above feed cost are produced by these four cows in one week?

$$6.345 + 10.2245 + 2.0282 + 11.0882 = 29.6859 * 7 = \underline{\$207.80}$$

\$207.80 (2 pts.)

10. Using component pricing in **Table 1**, what is the value of butterfat and protein produced by **cow 6** in one week?

\$72.27 value of butter fat (2 pts.)

$$98 * .037 * 2.8473 * 7 = \underline{\$72.27}$$

(Or Butterfat Value on Table 1 * 7)

\$37.18 value of protein (2 pts.)

$$98 * .031 * 1.7485 * 7 = \underline{\$37.18}$$

(Or Protein Value on Table 1 * 7)

11. Using component pricing in **Table 1**, based on value of milk produced after feed cost, which cow should be culled from the herd?

Cow 1 (2 pts.)

Complete the Table 1, cells A thru Y (2 pts. per blank cell, IF legible)

| Table 1 | | | | | | | Part 1 | | | | | | |
|----------------|---------------------------|-------------|-----------|----------------|-------------------------------|-------------------|---|---|--|--|--|--|---|
| Cow Production | | | | | | Feed | Components | | | | Income Comparisons - Statistical Uniform Price @ \$15.82/cwt | | |
| | Lbs. Milk per Day per Cow | Butterfat % | Protein % | Other Solids % | Somatic Cell Count (cells/ml) | Feed Cost per Day | Butterfat component \$2.8473 per pound produced | Protein component \$1.7485 per pound produced | Other solids component \$0.2158 per pound produced | SCC component \$0.00081 per 1,000 SCC above/below 350,000 cells/ml | Blended Price: Per Day \$ Value of Daily Milk if sold at @ \$15.82/cwt | Per Day \$ Value of Milk Sold on Component Pricing | AFTER FEED: Value of Component Price Daily Milk Minus Feed Cost per Day |
| | | | | | | | \$2.8473 | \$1.7485 | \$0.2158 | \$0.00081 | | | |
| Example | 25 | 3.6 | 3.2 | 5.7 | 199,999 | \$6.50 | \$2.5626 | \$1.3988 | \$0.3075 | \$0.1215 | \$3.9550 | \$4.3904 | -\$2.1096 |
| Cow 1 | 30 | 3.4 | 3.1 | 5.7 | 290,000 | \$5.68 | \$2.9042 | \$1.6261 | \$0.3690 | \$0.0486 | A | \$4.9480 | -\$0.7320 |
| Cow 2 | 72 | 3.7 | 3.2 | 5.6 | 398,000 | \$6.10 | \$7.5852 | \$4.0285 | \$0.8701 | -\$0.0389 | \$11.3904 | B | \$6.3450 |
| Cow 3 | 55 | 3.5 | 3.3 | 5.8 | 161,000 | \$6.05 | \$5.4811 | \$3.1735 | \$0.6884 | \$0.1531 | \$8.7010 | \$9.4961 | C |
| Cow 4 | 62 | 3.6 | 2.9 | 5.7 | 1,750,000 | \$5.85 | D | \$3.1438 | \$0.7626 | -\$1.1340 | \$9.8084 | \$9.1276 | \$3.2776 |
| Cow 5 | 55 | 3.7 | 3.0 | 5.8 | 211,000 | \$6.90 | \$5.7943 | E | \$0.6884 | \$0.1126 | \$8.7010 | \$9.4803 | \$2.5803 |
| Cow 6 | 98 | 3.7 | 3.1 | 5.6 | 160,000 | \$6.75 | \$10.3243 | \$5.3119 | F | \$0.1539 | \$15.5036 | \$16.9745 | \$10.2245 |
| Cow 7 | 70 | 3.7 | 3.0 | 5.5 | 250,000 | \$6.05 | \$7.3745 | \$3.6719 | \$0.8308 | G | H | \$11.9582 | \$5.9082 |
| Cow 8 | 47 | 3.5 | 3.1 | 5.7 | 80,000 | \$6.00 | I | \$2.5476 | \$0.5781 | \$0.2187 | \$7.4354 | J | \$2.0282 |
| Cow 9 | 48 | 3.9 | 3.4 | 5.7 | 110,000 | \$5.65 | \$5.3301 | K | \$0.5904 | \$0.1944 | \$7.5936 | \$8.9685 | L |
| Cow 10 | 56 | 3.4 | 2.9 | 5.8 | 800,000 | \$5.95 | \$5.4213 | \$2.8396 | M | -\$0.3645 | N | \$8.5972 | \$2.6472 |
| Cow 11 | 108 | 3.7 | 2.9 | 5.4 | 195,000 | \$7.15 | \$11.3778 | \$5.4763 | \$1.2585 | O | \$17.0856 | P | \$11.0882 |
| Cow 12 | 83 | 3.3 | 2.9 | 5.5 | 1,250,000 | \$6.05 | Q | \$4.2086 | \$0.9851 | -\$0.7290 | \$13.1306 | \$12.2635 | R |
| Cow 13 | 59 | 3.6 | 3.1 | 5.6 | 175,000 | \$6.75 | \$6.0477 | S | T | U | V | W | \$3.3504 |
| Cow 14 | 56 | 3.6 | 3.0 | 5.7 | 760,000 | \$6.40 | \$5.7402 | \$2.9375 | X | -\$0.3321 | \$8.8592 | \$9.0344 | \$2.6344 |
| Cow 15 | 44 | 3.7 | 3.2 | 5.8 | 181,000 | \$6.30 | \$4.6354 | \$2.4619 | \$0.5507 | \$0.1369 | Y | \$7.7849 | \$1.4849 |

Table 1 Key

| Cow Production | | | | | | Feed | Components | | | | Income Comparisons - Statistical Uniform Price @ \$15.82/cwt | | |
|----------------|---------------------------|-------------|-----------|----------------|-------------------------------|-------------------|---|---|--|--|--|--|---|
| | Lbs. Milk per Day per Cow | Butterfat % | Protein % | Other Solids % | Somatic Cell Count (cells/ml) | Feed Cost per Day | Butterfat component \$2.8473 per pound produced | Protein component \$1.7485 per pound produced | Other solids component \$0.2158 per pound produced | SCC component \$0.00081 per 1,000 SCC above/below 350,000 cells/ml | Blended Price: Per Day \$ Value of Daily Milk if sold at @ \$15.82/cwt | Per Day \$ Value of Milk Sold on Component Pricing | AFTER FEED: Value of Component Price Daily Milk Minus Feed Cost per Day |
| | | | | | | | \$ 2.8473 | \$ 1.7485 | \$ 0.2158 | \$ 0.00081 | | | |
| Example | 25 | 3.6 | 3.2 | 5.7 | 199999 | 6.5 | \$ 2.5626 | \$ 1.3988 | \$ 0.3075 | \$ 0.1215 | \$ 3.9550 | \$4.3904 | -\$2.1096 |
| Cow 1 | 30 | 3.4 | 3.1 | 5.7 | 290000 | \$ 5.68 | \$2.9042 | \$1.6261 | \$0.3690 | \$0.0486 | \$4.7460 | \$4.9480 | -\$0.7320 |
| Cow 2 | 72 | 3.7 | 3.2 | 5.6 | 398000 | \$ 6.10 | \$7.5852 | \$4.0285 | \$0.8701 | -\$0.0389 | \$11.3904 | \$12.4450 | \$6.3450 |
| Cow 3 | 55 | 3.5 | 3.3 | 5.8 | 161000 | \$ 6.05 | \$5.4811 | \$3.1735 | \$0.6884 | \$0.1531 | \$8.7010 | \$9.4961 | \$3.4461 |
| Cow 4 | 62 | 3.6 | 2.9 | 5.7 | 1750000 | \$ 5.85 | \$6.3552 | \$3.1438 | \$0.7626 | -\$1.1340 | \$9.8084 | \$9.1276 | \$3.2776 |
| Cow 5 | 55 | 3.7 | 3 | 5.8 | 211000 | \$ 6.90 | \$5.7943 | \$2.8850 | \$0.6884 | \$0.1126 | \$8.7010 | \$9.4803 | \$2.5803 |
| Cow 6 | 98 | 3.7 | 3.1 | 5.6 | 160000 | \$ 6.75 | \$10.3243 | \$5.3119 | \$1.1843 | \$0.1539 | \$15.5036 | \$16.9745 | \$10.2245 |
| Cow 7 | 70 | 3.7 | 3 | 5.5 | 250000 | \$ 6.05 | \$7.3745 | \$3.6719 | \$0.8308 | \$0.0810 | \$11.0740 | \$11.9582 | \$5.9082 |
| Cow 8 | 47 | 3.5 | 3.1 | 5.7 | 80000 | \$ 6.00 | \$4.6838 | \$2.5476 | \$0.5781 | \$0.2187 | \$7.4354 | \$8.0282 | \$2.0282 |
| Cow 9 | 48 | 3.9 | 3.4 | 5.7 | 110000 | \$ 5.65 | \$5.3301 | \$2.8536 | \$0.5904 | \$0.1944 | \$7.5936 | \$8.9685 | \$3.3185 |
| Cow 10 | 56 | 3.4 | 2.9 | 5.8 | 800000 | \$ 5.95 | \$5.4213 | \$2.8396 | \$0.7009 | -\$0.3645 | \$8.8592 | \$8.5972 | \$2.6472 |
| Cow 11 | 108 | 3.7 | 2.9 | 5.4 | 195000 | \$ 7.15 | \$11.3778 | \$5.4763 | \$1.2585 | \$0.1256 | \$17.0856 | \$18.2382 | \$11.0882 |
| Cow 12 | 83 | 3.3 | 2.9 | 5.5 | 1250000 | \$ 6.05 | \$7.7988 | \$4.2086 | \$0.9851 | -\$0.7290 | \$13.1306 | \$12.2635 | \$6.2135 |
| Cow 13 | 59 | 3.6 | 3.1 | 5.6 | 175000 | \$ 6.75 | \$6.0477 | \$3.1980 | \$0.7130 | \$0.1418 | \$9.3338 | \$10.1004 | \$3.3504 |
| Cow 14 | 56 | 3.6 | 3 | 5.7 | 760000 | \$ 6.40 | \$5.7402 | \$2.9375 | \$0.6888 | -\$0.3321 | \$8.8592 | \$9.0344 | \$2.6344 |
| Cow 15 | 44 | 3.7 | 3.2 | 5.8 | 181000 | \$ 6.30 | \$4.6354 | \$2.4619 | \$0.5507 | \$0.1369 | \$6.9608 | \$7.7849 | \$1.4849 |

Problem Solving Part 1

Chapter: Key

Chapter Number: _____

Team Members: _____

Neatly write answers on the corresponding lines below.

A. \$ 4.7460

J. \$ 8.0282

S. \$ 3.1980

B. \$ 12.4450

K. \$ 2.8536

T. \$ 0.7130

C. \$ 3.4461

L. \$ 3.3185

U. \$ 0.1418

D. \$ 6.3552

M. \$ 0.7009

V. \$ 9.3338

E. \$ 2.8850

N. \$ 8.8592

W. \$ 10.1004

F. \$ 1.1843

O. \$ 0.1256

X. \$ 0.6888

G. \$ 0.0810

P. \$ 18.2382

Y. \$ 6.9608

H. \$ 11.0740

Q. \$ 7.7988

I. \$ 4.6838

R. \$ 6.2135

FFA Dairy Foods Written Exam 2019 (Manchester)

- | | |
|------|-------|
| 1. D | 51. C |
| 2. A | 52. D |
| 3. D | 53. C |
| 4. D | 54. B |
| 5. D | 55. D |
| 6. A | 56. C |
| 7. D | 57. C |
| 8. D | 58. B |
| 9. C | 59. B |
| 10.D | 60. A |
| 11.D | |
| 12.C | |
| 13.D | |
| 14.D | |
| 15.A | |
| 16.B | |
| 17.D | |
| 18.B | |
| 19.A | |
| 20.B | |
| 21.A | |
| 22.D | |
| 23.C | |
| 24.D | |
| 25.B | |
| 26.B | |
| 27.B | |
| 28.D | |
| 29.C | |
| 30.B | |