

2013 North Carolina Milk Quality and Products Career Development Event Part V: Team Activity (50 points)

Name: _____

Chapter: _____

This activity involves calculations of the prices of milk of the four classes provided by the Federal Milk Marketing Orders. The overall price for an individual milk producer will be calculated. The information needed is presented independently in each part of the problem. **Round all <u>final</u> values to the nearest 0.01.** Formulas are provided that are applied in federal milk marketing orders.

Mark your answers on the scantron form provided. Turn this paper in with your scantron form upon completion of the activity. You may do your work on this paper.

Part I Calculate the price of Class III milk (used for cheese making) by summing the values of butterfat, protein, and other solids.

Step 1 Calculate the price of butterfat when given:

- NASS average price for AA grade butter = <u>\$2.01</u>
- Make allowance = \$0.13
- Yield factor = <u>1.22</u>

Formula to be used: Butterfat value/lb. = (price of butter - make allowance) x yield factor

Solution: $(2.01 - 0.13) \times 1.22 = (2.29)$ /lb butterfat (2.2936)

- 1. Mark the correct answer on the scantron form for the price of butterfat:
 - a. \$2.43
 - b. \$2.29
 - c. \$2.53
 - d. \$1.97

Step 2 Calculate the value of protein in Class III milk when given:

- NASS weighted average cheese price = <u>\$1.72</u>
- Make allowance = \$0.12
- Yield factor attributable to protein = <u>1.39</u>
- Yield factor attributable to fat = <u>1.23</u>
- Butterfat price = <u>\$1.51</u>
- Average ratio of fat to protein in milk = <u>1.22</u>

Formula to be used: Protein value/lb. = ((cheese price – make allowance) x protein's yield factor) + ((((cheese price – make allowance (x fat's yield factor) –(butterfat price x 0.9) x fat to protein ratio)

Solution: $((\underline{1.72} - \underline{.12}) \times \underline{1.37}) + ((((\underline{1.72} - \underline{0.12}) \times \underline{1.23}) - (\underline{1.51} \times 0.9) \times \underline{1.22}) =$ \$<u>2.53</u>/Ib. protein

2. Mark the correct answer on the scantron form for the value of protein:

- a. \$1.99
- b. \$2.35
- c. \$2.11
- d. \$2.53

Step 3 Calculate the value of "other solids" when given:

- Dry whey price = \$0.61/lb
- Make allowance = \$0.13
- Yield factor = 0.97

Formula to be used: "Other solids" value/lb. = (dry whey price - make allowance) x yield factor

Solution: $(0.61 - 0.13) \times 0.97 = 0.47 /lb. other solids (0.4656)

3. Mark the correct answer on the scantron form for the value of "other solids":

- a. \$0.47_
- b. \$0.38
- c. \$0.39
- d. \$0.41

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Step 4 Calculate the Class III skim milk price of milk from Delta Milk Company when given:

- Delta Company's milk tested out at:
 - o 3.3% protein
 - o 4.9% "other solids"
 - Price of protein /lb. = \$2.74
- Price of other solids/lb. = \$0.34

Formula to be used: Class III skim milk price/cwt = (% protein x protein price/lb) + (% other solids x other solids price/lb)

Solution: $(3.3 \times 2.74) + (4.9 \times 0.34) = (10.71)/cwt Class III skim milk (10.708)$

- 4. Mark the correct answer on the scantron form for the price of Delta Milk Company's Class III skim milk:
 - a. \$10.51
 - b. \$10.71
 - c. \$10.66
 - d. \$10.72

Step 5 Calculate the **price** of **Class III whole milk** by summing the values of the components used by Dairy's Delta Milk Company when given the following data:

- 3.3% protein @\$2.74/lb
- 3.7% butterfat @\$1.45/lb
- 4.9% other solids @\$0.34/lb

Formula to be used: Class III milk price/cwt = (% protein x price/lb) + (% fat x price/lb) = (% other solids x price/lb).

Solution: $(3.3 \times 2.74) + (3.7 \times 1.45) + (4.7 \times 0.34) = $ 16.07/cwt Class III milk (16.073)$

- 5. Mark the correct answer on the scantron form for the price/cwt of Delta Milk Company's Class III skim milk:
 - a. \$16.07
 - b. \$16.31
 - c. \$16.50
 - d. \$16.75

Part II Calculate the Price for Class IV milk (used to make butter and nonfat dry milk) by summing the values of Class IV skim milk and butterfat using the three steps below.

Step 1 Calculate the nonfat milk solids price when given:

- Average NASS price of nonfat dry milk (NDM) = \$1.19/lb
- Make allowance = \$0.18/lb
- Yield factor = 0.96

Formula to be used: Nonfat solid price/lb = (NDM price - make allowance) x yield factor

Solution: $(1.17 - 0.18) \times 0.96 = $0.97/lb.$ NMS (0.9696)

6. Mark the correct answer on the scantron form for the price of nonfat milk solids:

- a. <u>\$0.97</u> b. \$0.99
- c. \$1.01
- d. \$1.11

Step 2 Calculate the value of Class IV skim milk containing 8.7% nonfat solids and the value of those solids is \$0.97/lb.

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Formula to be used: Price of Class IV skim milk = % nonfat milk solids x price/lb. of NMS

Solution: <u>8.7</u> x <u>0.97</u> = \$ <u>8.44</u> /cwt Class IV skim milk

- 7. Mark the correct answer on the scantron form for the price/cwt of Class IV skim milk:
 - a. \$8.67
 - b. \$8.47
 - c. \$8.80
 - d. \$8.44

Step 3 Calculate the Class IV milk price when given:

- Price of skim milk = \$8.80/cwt
- Butterfat content = 3.6%
- Price of butterfat/lb = \$1.45
- Note: To obtain lb. skim milk/lb. milk, subtract from 1 the amount of milk fat in 1 lb of milk.
 For example, if the milk fat is 5%, 1.00 0.05 = 0.95 lb skim milk/lb milk).

8.4832 + 5.22 = 13.7032

Formula to be used: Class IV milk price = (lb skim milk/lb milk x price/cwt) + (lb butterfat x price/lb)

Solution: $(0.964 \times 8.89 + (3.6 \times 1.45) = $ 13.70/cwt Class IV milk$

- 8. Mark the correct answer on the scantron form for the price/cwt of Class IV milk:
 - a. \$13.60
 - b. \$13.64
 - c. \$13.70
 - d. \$13.67

Part III Use the values provided in the Table below to calculate the prices of milk in Classes I and II. These are NOT the same values that you calculated in problems 1 – 8.

NOTE: THE FEDERAL ORDER POLICY IS THAT THE SKIM MILK PRICE FOR CLASSES I AND II ARE THE HIGHER OF SKIM MILK PRICES OF CLASS III OR IV.

Class III Skim Milk	\$10.47/cwt
Class IV Skim Milk	\$8.80/cwt
Butterfat	\$1.45/lb.
Class I Butterfat content	3.5%
Protein	\$2.73/lb
Class I differential	\$2.00/cwt.
Class II differential	\$0.60cwt.

Step 1 Calculate the value per cwt of Class I milk containing 3.5% butterfat.

Formula to be used: Class I value/cwt = (lb skim milk/lb milk x price/cwt) + (lb butterfat x price/lb) + Class I differential

 $10 \pm 0355 + 5.075 + 2.00 = 17.17855$

Solution: $(.965 \times 10.47) + (3.5 \times 1.45) + 2.00 = $17.18/cwt Class I milk$

9. Mark the correct answer on the scantron form for the price/cwt of Class I milk:

- a. \$17.01
- b. \$17.11
- c. \$<u>17.18</u>
- d. \$17.27

Part IV When given utilization percentages and prices for the four classes of milk in the market during the pay period, calculate the individual values for the four classes and then calculate the overall value per hundred-weight (cwt) of milk from Premium Dairy Producer. The table below has the information needed.

Premium Dairy Producer Marketing Order			
Class of Milk	Utilization Percentage (%)	Price/cwt (\$)	Value (\$)
I	20	\$15.24	3.048
	30	\$15.19	4.557
Ξ	30	\$15.23	4.569
ĪV	20	\$13.55	2.710
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All Milk Price/cwt =			14.884

10. Mark the correct answer on the scantron form for the overall value per hundred-weight (cwt) of milk:

- a. \$14.76
- b. \$14.88
- c. \$14.84
- d. \$14.61