South Dakota FFA Milk Quality and Products CDE

Team Problems – 2014 - KEY

General Instructions: These problems are to be examined as a team. The proper responses are to be recorded on the bubble sheet for contestant 1 from each team. It is permissible to write on this exam if it will assist in your work. Each question is worth 20 points; therefore, each incorrect response will deduct 20 points to your team total in a contest where the highest score is desired.

Situation A

A large regional ice cream manufacturer is planning to make 25,000 pounds of an ice cream mix with the following composition: 13.25% Milkfat, 9.45% MSNF, 14.5 % Sucrose, 2.55% Corn Syrup Solids 36 DE and 0.28% Stabilizer/Emulsifier.

The dairy ingredients which they have available include 42% milkfat cream which also contributes 5.22% MSNF, and NFDM at1% milk fat and 97% MSNF. For ease in calculation, assume that this mix is balanced with water. Assume that sucrose and stabilizer/emulsifier are 100% total solids. The corn syrup solids contain 28% moisture. The finished ice cream mix will weigh 9.2 pounds per gallon.

1. The manufacturer desires to utilize 70% of the mix to freeze and package Vanilla ice cream frozen at 80% overrun. The remaining 30% of the mix will be utilized to manufacture Cookies and Cream ice cream frozen at 85% overrun. How many gallons of Vanilla ice cream and Cookies and Cream ice cream is the manufacturer expecting?

1. 17,500 Vanilla and 7,500 Cookies and Cream
2. 3,424 Vanilla and 1,508 Cookies and Cream
3. 1,902 Vanilla and 815 Cookies and Cream
4. 31,500 Vanilla and 13,875 Cookies and Cream

Situation B

Farmer Brown is a Grade A producer milking 2,400 Jerseys. The herd average is 18,300 pounds per cow per year at 4.48 % milkfat and 3.46% protein. The herd also is averaging 74,000 somatic cells per milliliter. Farmer Brown has the milk picked up every day. One full truckload of milk is 51,600 pounds; therefore, it is possible that more than one truck will be required to stop each day.

The local cheese cooperative is paying a base price of $23.35 per hundredweight with a 12 cent differential for each 0.1% milkfat above 3.5% and a 18.5 cent differential for each 0.1% protein above 3.1%. The plant is also paying 1.3 cents per hundredweight for somatic cell counts less than 350,000 per milliliter and 1.7 cents per hundredweight for somatic cells lower than 125,000 per milliliter. The cooperative is charging 48 cents per hundredweight for hauling and a $28 stop charge for each tanker required.

Based on the above data answer the following questions:

2. What will be the bi-weekly milk check Farmer Brown?

 a. $493,187.52

 b. $504,040.32

 c. $467,550.72

 d. $485,647.68

Situation C

Mr. Allen, milk hauler for Y-Z Cooperative, picked up milk from 5 producers and delivered the milk to Farnsworth Dairy. The following information was collected from the milk hauler, Y-Z Cooperative and Farnsworth Dairy:

 Producer “A” 8,000 pounds @ 3.92% milk fat

 Producer “B” 13,200 pounds @ 3.72% milk fat

 Producer “C” 20,750 pounds @ 3.57% milk fat

 Producer “D” 4,150 pounds @ 4.25% milk fat

 Producer “E” 5,250 pounds @ 4.55% milk fat

3. What is the total amount of milk fat on this tanker and what is the milk fat test?

1. 51,350 pounds and 3.66%

# b. 1,916 pounds and 3.76%

c. 2,260 pounds and 3.98%

##  1,961 pounds and 3.82%

Situation D

Mr. Anderson, milk hauler for Triple L Cooperative, picked up milk from 3 producers and delivered the milk to Johnson Dairy. The following information was collected from the milk hauler, Triple L Cooperative and Johnson Dairy:

 Producer “A” 9,800 pounds @ 3.9% milk fat

 Producer “B” 16,600 pounds @ 3.7% milk fat

 Producer “C” 22,700 pounds @ 3.4% milk fat

4. How many pint containers of Half and Half can Johnson Dairy package using all the milk? Half

 and Half weighs 8.5 pounds per gallon and contains approximately 10.5% milk fat. The cream

 removed was 43% milk fat and weighs 8.3 pounds per gallon? Nonfat milk is 0.08% and weighs

 8.64 pounds per gallon.

a. 49,100 containers

# b. 16,587containers

c. 15,987 containers

## d 1,768 containers

5. How much nonfat milk will Johnson Dairy have available to package into whatever container

sizes are required?

 a. 32,513 pounds

 b. 515,550 pints

 c. 176,760quarts

 d. 16,587 pounds