

Instructions: This exercise consists of 12 multiple-choice questions. Each question is worth two points. Mark your answer on the back side of your answer sheet in the section labeled "Part II."

- Calculate the weight of milk fat (in pounds) contained in 250 lb. of milk having 3.5% fat.
 - 7.14 lb.
 - 8.75 lb.**
 - 71.43 lb.
 - 87.50 lb.
 - None of the above
- If 32 lb. of fat are obtained from a batch of 25% cream, what is the weight of the cream?
 - 1.28 lb.
 - 8 lb.
 - 12.8 lb.
 - 80 lb.
 - 128 lb.**
- If cow's milk protein contains approximately 78% casein, what is the casein content of 3.2% protein milk?
 - 0.25%
 - 2.5%**
 - 7.8%
 - 24.38%
 - 24.96%
- Assuming that sample 1 represents 100 gallons of 3.5% milk, sample 2 represents 200 gallons of 3.7% milk, and sample 3 represents 150 gallons of 3.1% milk, calculate the weighted average percentage fat after the three samples are mixed together.
 - 0.35%
 - 1.56%
 - 3.43%
 - 3.46%**
 - 15.55%
- What is the value of 1,000 lb. of 30% fat cream at a price of \$1.25 per lb. of fat?
 - \$3.75
 - \$37.50
 - \$125.00
 - \$375.00**
 - \$1,250.00
- You are considering starting an on-farm cheese plant to process your own milk. You are milking 250 cows that are averaging 80 pounds of milk per cow per day. How many pounds of cheese would you expect to produce on a daily basis?
 - 2,000**
 - 2,500
 - 20,000
 - 25,000
 - 200,000
- Vickie Michaels received \$4,340.00 for 35,000 lb. of milk shipped to the Hokie Cheese Factory in May. What is her average price per cwt. for milk in May?
 - \$3.50/cwt
 - \$8.06/cwt
 - \$12.40/cwt**
 - \$35.00/cwt
 - \$43.40/cwt
- What is the value of milk at 3.9% fat, 3.3% protein if the value of 3.5% fat, 3.2% protein is \$13.00 per cwt? The fat differential is \$0.13 for every 0.1 above 3.5% fat and the protein differential is \$0.30 for every 0.1 over 3.2%.
 - \$13.08/cwt
 - \$13.28/cwt
 - \$13.43/cwt
 - \$13.82/cwt**
 - \$14.33/cwt
- How many pounds of skim milk (0% fat) must be added to 365 lb. of 27.5% cream to bring the fat test to 23.0%?
 - 16.43 lb.
 - 71.41 lb.**
 - 83.95 lb.
 - 100.38 lb.
 - 1,865.56 lb.

Table 1

Cow	Milk/day (lb.)	Fat (%)	Protein (%)	SCC (cells/ml)
A	75	3.6	3.1	500,000
B	65	3.5	3.2	650,000
C	82	3.2	3.0	100,000
D	49	4.0	3.2	180,000

Use the data in Table 1 to answer questions 10-12.

- How many total pounds of fat were produced per day by these four cows?
 - 9.6 lb.**
 - 14.3 lb.
 - 19 lb.
 - 38.8 lb.
 - 96 lb.
- Which cow produced the most pounds of protein per day?
 - A
 - B
 - C**
 - D
- What is the weighted average somatic cell count for these four cows?
 - 5,276 cells/ml
 - 357,085 cells/ml**
 - 357,500 cells/ml
 - 1,430,000 cells/ml
 - 24,192,500 cells/ml

**2006 Virginia FFA Dairy Foods Career Development Event
Class 7 - Written Test**

Instructions: This test consists of 50 multiple-choice questions. Each question is worth two points. Mark your answer on the back side of your answer sheet in the section labeled "Written Test."

Production Questions

1. Who developed the test for fat content in milk and cream?
(A) S.M. Babcock
(B) Gail Borden
(C) W.D. Hoard
(D) Louis Pasteur
(E) Harvey Thatcher
2. The rumen makes up approximately what percent of the mature cow's stomach capacity?
(A) 10%
(B) 25%
(C) 50%
(D) 65%
(E) 80%
3. What is most likely to be the limiting nutrient for the high producing dairy cow?
(A) Energy
(B) Minerals
(C) Protein
(D) Vitamins
(E) Water
4. How many amino acids are considered to be "essential" for milking cows and must be provided in their diet?
(A) 0
(B) 2
(C) 10
(D) 12
(E) 22
5. Which one of the following minerals is an example of a macromineral in dairy rations?
(A) Calcium
(B) Cobalt
(C) Manganese
(D) Selenium
(E) Zinc
6. What pituitary hormone is critical for the initiation and maintenance of lactation?
(A) Estrogen
(B) Oxytocin
(C) Progesterone
(D) Prolactin
(E) Prostaglandin
7. What is the name of the waxy substance produced by cells lining the teat canal that serves as a plug between milkings and aids in reducing penetration by microorganisms?
(A) Alveoli
(B) Corpus luteum
(C) Keratin
(D) Myoepithelium
(E) Navel
8. What is the most common type of milking parlor in use today?
(A) Herringbone
(B) Parabone
(C) Parallel
(D) Rotary
(E) Side-opening
9. How often should teat cup liners be replaced?
(A) Every 1,000-1,200 cow milkings
(B) Every 5,000-6,000 cow milkings
(C) Once a week
(D) Once a month
(E) Once a year
10. How soon after the start of stimulation should the milking unit be attached to the cow?
(A) Immediately
(B) Within 20 seconds
(C) Within 1 minute
(D) Within 5 minutes
(E) It doesn't matter
11. Reduced milk production accounts for what percent of the losses associated with mastitis?
(A) 3%
(B) 5%
(C) 8%
(D) 14%
(E) 64%
12. What type of mastitis is characterized by sudden onset, redness, swelling, hardness, pain, grossly abnormal milk, and reduced milk yield?
(A) Acute
(B) Chronic
(C) Clinical
(D) Subclinical
(E) Subacute
13. In the United States somatic cell counts in raw milk may not exceed what level?
(A) 10,000 cells/ml
(B) 75,000 cells/ml
(C) 100,000 cells/ml
(D) 750,000 cells/ml
(E) 1,000,000 cells/ml

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14. Which one of the following is not a solution commonly used as a teat dip?
(A) Ammonium sulfate
(B) Bronopol
(C) Chlorhexidine
(D) Chlorine
(E) Iodine
15. Which one of the following decreases in concentration in mastitic milk?
(A) Casein
(B) Chloride
(C) Leukocytes
(D) Lipase
(E) Sodium
16. What percent of pregnant cows exhibit estrus?
(A) 3-5%
(B) 13-15%
(C) 23-25%
(D) 33-35%
(E) 43-45%
17. What percent of heifers born twin to a bull are sterile?
(A) 10%
(B) 25%
(C) 50%
(D) 90%
(E) 100%
18. How often is pregnancy rate usually calculated?
(A) Weekly
(B) Every 21 days
(C) Monthly
(D) Bimonthly
(E) Annually
19. A colostrometer is a device used to measure the _____ in colostrum.
(A) antibiotics
(B) antibodies
(C) fat
(D) lactose
(E) protein
20. Which cows are at a greater risk of having milk fever?
(A) Fat cows
(B) Jerseys
(C) Older cows
(D) All of the above
(E) None of the above
21. What is the common name for dystocia?
(A) Calving difficulty
(B) Circling disease
(C) Mad cow disease
(D) Milk fever
(E) Twisted stomach
22. What is the most common way to give an antibiotic to a cow?
(A) Intramammary infusion
(B) Intramuscular injection
(C) Intraperitoneal injection
(D) Intravenous injection
(E) Intrauterine infusion
23. What is the name of the process by which udder tissue reverts to a non-milk-producing state after drying off?
(A) Edema
(B) Evaporation
(C) Evolution
(D) Involution
(E) Regression
24. Which breed produces milk with the highest fat and protein content?
(A) Ayrshire
(B) Brown Swiss
(C) Guernsey
(D) Holstein
(E) Jersey
25. Lactation records in progress can be used in calculation of USDA-AIPL Sire Summaries if they have at least one test and are a minimum of how many days in length?
(A) 7
(B) 40
(C) 60
(D) 100
(E) 305
- Marketing Questions
26. What label is given to milk that contains 2.5 grams of fat and 100 calories per cup?
(A) Fat free milk
(B) Lowfat milk
(C) Reduced fat milk
(D) Skim milk
(E) Whole milk
27. To which milk class does hard manufactured cheese belong?
(A) Class I
(B) Class II
(C) Class III
(D) Class IV
28. Multiple component pricing is used in how many Federal Milk Marketing Orders?
(A) None
(B) 2
(C) 4
(D) 6
(E) 8

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29. What is the largest milk producing cooperative based on member milk volume?
(A) California Dairies, Inc.
(B) Dairy Farmers of America
(C) Family Dairies USA
(D) Land O'Lakes, Inc.
(E) Northwest Dairy Association
30. Which USDA agency administers the MILC program?
(A) Agricultural Marketing Service
(B) Animal and Plant Health Inspection Service
(C) Animal Improvement Programs Laboratory
(D) Farm Service Agency
(E) National Agricultural Statistics Service
31. The Cooperatives Working Together (CWT) program is operated within the structure of what organization?
(A) American Dairy Association
(B) National Dairy Herd Improvement Association
(C) National Milk Producers Federation
(D) National Supermarkets Alliance
(E) Southeast United Dairy Industry Association
32. Lactose intolerance is the condition that exists when a person cannot metabolize what?
(A) Fat
(B) Milk sugar
(C) Minerals
(D) Protein
(E) Vitamins
33. What temperature is used to pasteurize milk using the batch method of pasteurization?
(A) 100°F
(B) 145°F
(C) 161°F
(D) 175°F
(E) 212°F
34. What is the name of the process at the dairy plant that assures that milk and dairy products will be uniform in protein and fat content?
(A) Clarification
(B) Coagulation
(C) Homogenization
(D) Pasteurization
(E) Standardization
35. What enzyme is used to coagulate milk when making cheese?
(A) Amylase
(B) Lactase
(C) Lipase
(D) Protease
(E) Rennet
36. How many pounds of whole milk does it take to make a pound of butter?
(A) 8.6
(B) 10.0
(C) 12.0
(D) 16.0
(E) 21.2
37. Cream must contain at least what percent milk fat?
(A) 3.5%
(B) 8.75%
(C) 18%
(D) 32%
(E) 80%
38. Pigmented milk cartons are used to prevent what off-flavor in milk?
(A) Bitter
(B) Fermented
(C) Fruity
(D) Oxidized
(E) Sour
39. What test is used to detect rancidity in milk?
(A) Acid degree value
(B) Charm test
(C) Cryoscope
(D) Milk ring test
(E) Phosphatase test
40. What is the main reason that antibiotics are not allowed in milk for human consumption?
(A) Antibiotics are not a natural part of milk.
(B) Antibiotics are expensive.
(C) Bacteria may become resistant to antibiotics.
(D) Milk is not suitable for cheese making.
(E) Some people are allergic to antibiotics.
41. What does a standard plate count measure?
(A) Antibiotic residues
(B) Bacterial content of raw milk
(C) Freezing point of milk to determine if water has been added
(D) Sediment
(E) Somatic cell counts
42. What organization establishes the standards for Grade A milk?
(A) Dairy Management, Inc.
(B) Farm Service Agency
(C) Food and Drug Administration
(D) National Conference on Interstate Milk Shipments
(E) National Mastitis Council

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43. The Farm Security and Investment Act of 2002 extended the current dairy price support through December 2007. What is the current dairy price support?
(A) \$5.50/cwt
(B) \$9.90/cwt
(C) \$10.00/cwt
(D) \$12.50/cwt
(E) \$15.00/cwt
44. The amount of cheese one can get from a pound of milk is most affected by the _____ content of the milk.
(A) fat
(B) protein
(C) mineral
(D) water
(E) vitamin
45. What is the highest grade of butter sold in the United States?
(A) U.S. Grade A
(B) U.S. Grade AA
(C) U.S. Grade AAA
(D) U.S. Grade B
(E) U.S. Grade C
46. Mozzarella and _____ are the two most popular varieties of cheese in the United States.
(A) Cheddar
(B) Colby
(C) Monterey Jack
(D) Provolone
(E) Swiss
47. Soft, semi-soft, hard, and very hard are four classes of what dairy product?
(A) Butter
(B) Cheese
(C) Ice Cream
(D) Sour cream
(E) Yogurt
48. Lipase is an enzyme that breaks down butterfat. What off-flavor in milk does it cause?
(A) Bitter
(B) High acid
(C) Oxidized
(D) Rancid
(E) Sour
49. According to Dairy Management, Inc., one out of every _____ pounds of cheese is eaten as part of a sandwich.
(A) two
(B) three
(C) four
(D) five
(E) six
50. How many calories are in a cup of whole milk?
(A) 80
(B) 100
(C) 120
(D) 150
(E) 200