

1995

FFA DAIRY FOODS CONTEST

ANALYZE AND INTERPRET INFORMATION

MILK FACTS - 1994 Edition

MILESTONES OF MILK HISTORY IN THE U.S.

Page 3

1. What year did the first farm bulk tanks begin to replace milk cans?
 - a. 1938
 - b. 1945
 - c. 1949
 - d. 1953

 2. In what year was BST approved for commercial use?
 - a. 1987
 - b. 1988
 - c. 1990
 - d. 1994
-

THE FLUID MILK INDUSTRY: STATISTICS FROM THE BUREAU OF THE CENSUS

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3. How many fewer fluid milk plants were there in the U.S. between 1987 and 1992?
 - a. 383
 - b. 315
 - c. 206
 - d. 197

4. How much more valuable were the fluid milk product shipments in the U.S. during the 10 years from 1982 and 1992?
 - a. \$1,950,000,000
 - b. \$2,800,000,000
 - c. \$2,923,000,000
 - d. \$3,230,000,000

CONSUMER EXPENDITURES FOR DAIRY PRODUCTS AS COMPARED WITH ALL FOODS

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5. We food consumers spent how many \$ in 1992 for dairy products?
- a. \$62.5 billion
 - b. \$63.0 billion
 - c. \$63.5 billion
 - d. \$65.5 billion
6. During the recent 17 years, U.S. food consumers spent what percentage of their food dollar for dairy products?
- a. 10.7 - 12.4
 - b. 11.1 - 12.8
 - c. 10.6 - 12.6
 - d. 10.0 - 13.0
-

DOMESTIC END USES OF DRY MILK PRODUCTS, 1993

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7. Nonfat Dry Milk is utilized in the U.S. for a wide variety of foods and pharmaceutical products. What group or industry utilizes the largest quantity of Nonfat Dry Milk?
- a. Dairy industry
 - b. Meat processors
 - c. Baking industry
 - d. At home use
8. Dry buttermilk is utilized in the largest quantities in the U.S. by what segment of the food industry?
- a. Dry mix industry
 - b. Bakery industry
 - c. Confectionery industry
 - d. Dairy industry

PER CAPITA SALES OF MANUFACTURED DAIRY PRODUCTS, 1983-1993

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9. Of the two types of frozen desserts listed in the Page 17 table, which one has had the largest decrease in per capita sales from 1983 to 1993?
 - a. Ice cream
 - b. Ice milk

10. Which categories of dairy foods have enjoyed an increase in consumption during the 1983-1993 decade?
 - a. Butter, cottage cheese, American cheese, Evaporated milk
 - b. American cheese, butter, nonfat dry milk, ice cream
 - c. Butter, American cheese, other cheeses, dry whole milk, nonfat dry milk, dry whey, Evap. & Cond. skim milk
 - d. Butter, American cheese, cottage cheese, dry whey, evaporated & condensed whole milk

MILESTONES OF MILK HISTORY IN THE U.S.

1611	Cows arrive for Jamestown Colony.
1624	Cows reach Plymouth Colony.
1841	First regular shipment of milk by rail—Orange County to New York City
1856	Pasteur experiments start
1856	Gail Borden received first patent on condensed milk from both U.S. and England.
1857	First successful condensery built by Gail Borden at Burrville, Connecticut.
1878	Continuous centrifugal cream separator invented by Dr. Gustav De Laval.
1884	Milk bottle invented by Dr. Hervey D. Thatcher, Potsdam, New York
1886	Automatic bottle filler and capper patented.
1890	Tuberculin testing of dairy herds introduced. Test for fat content of milk and cream perfected by Dr. S.M. Babcock.
1892	Certified milk originated by Dr. Henry L. Coit in Essex County, New Jersey.
1895	Commercial pasteurizing machines introduced.
1908	First compulsory pasteurization law (Chicago) applying to all milk except that from tuberculin tested cows.
1911	Automatic rotary bottle filler and capper perfected.
1914	Tank trucks first used for transporting milk.
1919	Homogenized milk sold successfully in Torrington, Conn.
1932	Ways of increasing Vit. D in milk made practicable.
1932	First plastic coated paper milk cartons introduced commercially.
1933	Fluid milk included in Army ration.
1938	First farm bulk tanks for milk begin to replace milk cans.
1942	Every-other-day milk delivery started (initially as a war conservation measure).
1946	Vacuum pasteurization method perfected.
1948	Ultra-high temperature pasteurization is introduced
1950	Milk vending machines win place in distribution.
1955	Flavor control equipment for milk is introduced commercially.
1964	Plastic milk container introduced commercially.
1967	Nondairy milk substitute introduced in several markets.
1968	Official acceptance of electronic testing for milk fat content.
1974	Nutrition labeling of fluid milk products.
1975	Metric measurement equivalent introduced.
1980	American Dairy Association launches the national introduction of the "REAL" (R) Seal dairy symbol.
1981	UHT (ultra high temperature) milks gain national recognition.
1983	Creation of National Dairy Promotion and Research Board.
1988	Lower fat dairy products gain widespread acceptance. Low fat plus skim milk sales exceed whole milk sales for first time.
1993	Mandatory animal drug residue testing program established.
1994	Bovine somatotropin approved for commercial use in U.S. Nutrition Labeling and Education Act requires mandatory nutrition labeling.

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CONSUMER EXPENDITURES FOR DAIRY PRODUCTS AS COMPARED WITH ALL FOODS, 1977-1993

	Dairy Products		All Foods ¹	
	\$ Billions		\$ Billions	Percentage of All Foods
1977	27.8		221.4	12.6
1978	30.1		246.4	12.2
1979	33.5		276.7	12.1
1980	37.8		306.0	12.4
1981	41.4		329.4*	12.6
1982	42.0		345.9*	12.1
1983	45.0		368.5*	12.2
1984	47.4		390.3*	12.1
1985	49.4		406.3*	12.2
1986	51.4		429.1*	12.0
1987	54.0		457.6*	11.8
1988	55.8		489.3*	11.4
1989	58.1		522.1*	11.1
1990	62.5		563.4*	11.1
1991	63.0		583.8*	10.8
1992	63.5*		593.8*	10.7
1993 ²	65.5		617.9	10.6

¹Excludes alcoholic beverages, food donated by the government, nonpersonal spending for food and institutional food use. ²Preliminary. *Revised
Source: U.S.D.A

MINUTES OF WORK REQUIRED TO PURCHASE MILK AND OTHER DAIRY PRODUCTS AT STORES, 1977-1993¹

	Milk ½ Gal.	Butter 1 Lb.	American Cheese ½ Lb.	Ice Cream ½ Gal.
1977	8.9	14.1	9.4	14.3
1978	8.6	14.4	9.3	14.2
1979	8.9	15.0	9.6	14.6
1980	8.7	15.5	9.7	15.0
1981	8.4	15.0	9.6	15.1
1982	7.9	14.4	9.3	14.9
1983	7.7	14.0	9.0	14.7
1984	7.4	13.8	8.9	14.5
1985	7.1	13.4	8.7	14.5
1986	6.9	13.3	8.0	14.5
1987	7.0	13.2	8.2	14.9
1988	7.0	12.7	8.2	14.5
1989	7.3	12.2	8.4	15.1
1990	7.9	11.0	N/A	14.4
1991	7.2	10.1	9.4	13.8
1992	7.0	9.2	8.4	13.5
1993 ²	7.7	9.2	8.9	14.0

¹Based on hourly wage rates of all manufacturing industries. ²Preliminary
N/A—Not Available
Source: U.S.D.A

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THE FLUID MILK INDUSTRY: STATISTICS FROM THE BUREAU OF THE CENSUS, SELECTED YEARS, 1982-1992¹

	1982 (Census)	1987 (Census)	1988 (ASM) ²	1989 (ASM) ²	1990 (ASM) ²	1991 (ASM) ²	1992 ³ (Census)
Companies (number)	854	654	610	585	N/A	N/A	527
All Establishments (Plants)							
Total	1,191	946	900	855	N/A	N/A	749
With 20 Employees or More	792	626	610	590	N/A	N/A	507
All Employees							
Number (1000)	84	72	73	72	70	69	63
Payroll (million dollars)	1,523	1,681	1,778	1,820	1,832	1,840	1,844
Production Workers							
Number (1000)	37.9	36.2	37.1	38.1	34.0	32.3	32.6
Hours (million)	77.8	74.2	76.6	74.5	71.6	69.5	71.1
Wages (million dollars)	693	789	841	856	865	867	897
Value Added by Manufacture (million dollars)	4,171	5,426	5,759	5,454	5,780	5,856	5,996
Cost of Materials (million dollars)	14,888	15,190	15,768	16,215	16,922	15,476	15,969
Value of Shipments (million dollars)	19,028	20,691	21,502	21,630	22,704	21,137	21,952
New Capital Expenditures (million dollars)	367	342	380	419	340	326	383

¹The Fluid Milk Industry is defined by the Bureau of the Census as comprising establishments for each of which the value of shipments of fluid milk, cream and related products are both primary and secondary to the industry

²Annual Survey of Manufacturers covering sample of establishments.

³Latest year available

*Revised.

DOMESTIC END USES OF DRY MILK PRODUCTS, 1993

NONFAT DRY MILK

<i>Domestic Uses</i>	<i>Million Lbs.</i>	<i>Percent of Domestic Uses</i>
Dairy	360.2	64
Bakery	61.9	11
Packaged for Home Use	59.1	10
Prepared Dry Mixes	11.3	2
Chemicals/Pharmaceuticals	11.3	2
Meat Processing	13.5	2
Other*	45.6	8
TOTAL DOMESTIC NONGOVERNMENT USE	562.9	100

*Includes use in confectionery, soft drink bottling, soup and margarine. Also includes use in institutions and as animal feed.

DRY WHOLE MILK

<i>Domestic Uses</i>	<i>Million Lbs.</i>	<i>Percent of Domestic Sales</i>
Confectionery	85.5	88
Dairy	4.2	4
Bakery	4.4	5
Prepared Food Manufacturers	2.0	2
Other*	1.1	1
TOTAL DOMESTIC SALES	97.2	100

*Includes all other domestic uses.

DRY BUTTERMILK

<i>Domestic Uses</i>	<i>Million Lbs.</i>	<i>Percent of Domestic Sales</i>
Dairy	31.6	36
Bakery	19.7	23
Prepared Dry Mixes	13.0	15
Confectionery	12.9	15
Other	9.8	11
TOTAL DOMESTIC SALES	87.0	100

*Includes both dry buttermilk and dry buttermilk products.

Source: American Dairy Products Institute, Chicago, IL. "1993 Dry Milk Products Utilization & Production Trends"

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PER CAPITA SALES OF MANUFACTURED DAIRY PRODUCTS, 1983-1993

	Cheese							Evapo- rated and con- densed whole milk	Evapo- rated and con- densed skim milk	Frozen Desserts	
	Butter ¹	American ¹	Other	Cottage cheese ²	Dry whole milk	Nonfat dry milk ¹	Dry whey ³			Ice cream product weight	Ice milk product weight
	(Pounds)										
1983	3.8	8.9	8.9	4.1	0.4	2.0	3.1	3.8	3.2	18.1	6.9
1984	3.8	9.6	9.6	4.1	0.4	2.1	3.2	3.7	3.7	18.2	7.0
1985	3.9	9.6	10.4	4.1	0.4	1.8	3.5	3.6	3.8	18.1	6.9
1986	3.8	9.9	11.0	4.1	0.5	2.0	3.7	3.6	4.3	18.4	7.2
1987	3.7	10.1	11.7	3.9	0.5	2.0	3.6	3.7	4.2	18.4	7.4
1988	3.7	10.5	12.2	3.9	0.6	3.0	3.5	3.5	4.2	17.3	8.0
1989	3.5	10.9	12.8	3.6	0.5	3.5	3.5	3.1	4.7	16.1	8.4
1990	3.7	11.1	13.5	3.4	0.6	2.8	3.7	3.1	4.8	15.8	7.7
1991*	3.7	10.8	13.9	3.3	0.4	2.6	3.8	3.2	5.0	16.3	7.4
1992*	3.7	11.3	14.7	3.1	0.5	2.7	3.8	3.2	5.2	16.3	7.1
1993 ⁴	4.0	11.4	14.8	2.9	0.5	2.4	3.8	3.0	5.2	16.1	6.0

¹Does not include government donations of this product.

²Does not include curd.

³Includes modified whey.

⁴Preliminary estimates.

*Revised

Source: U.S.D.A., Economic Research Service.

STATE OF IOWA
DEPARTMENT OF EDUCATION
BUREAU OF TECHNICAL AND VOCATIONAL EDUCATION
GRIMES STATE OFFICE BUILDING
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1995 Iowa FFA Dairy Foods Test
(Mark the best answer in the proper blank on the answer sheet.)

1. How can flavors of kerosene, creosote, or fly spray in milk be explained when milk is not exposed to any of these substances?
 - a. Oxidized milk tastes like fly spray.
 - b. Rubber inserts in teat cups may be breaking down chemically.
 - c. These flavors will occur in milk if the cow breathes odors from such substances.
 - d. Flavor may be caused by certain bacteria in unclean equipment.

2. Salty flavor in milk can be attributed to two things:
 - a. Too much salt in ration and impaired kidney function of the cow.
 - b. Excessive feeding of minerals and dry roughage.
 - c. Cows with mastitis and milk produced late in a cow's lactation period.
 - d. Some sanitizers have a salt base, or it may be due to hard water used in cleaning equipment.

3. Oxidized flavor in raw milk can be the result of copper. The likely cause is:
 - a. milk coming in contact with metal parts of the milking equipment that contains copper.
 - b. copper ions that are in the air cows breathe.
 - c. natural occurrences of copper in milk during first two months of lactation.
 - d. both a. and c.

4. Oxidized flavor in pasteurized milk likely was caused from:
 - a. heating during pasteurization.
 - b. milk in translucent plastic or glass bottles being exposed to light.
 - c. milk being exposed to too much air before packaging.
 - d. all of the above.

5. Lipolyzed flavor (rancid) may be the result of processing mistakes. To avoid this the processor must avoid:
 - a. holding milk in large containers.
 - b. keeping milk at 40 degrees F. for more than ten hours.
 - c. adding even a small amount of raw milk to homogenized milk.
 - d. both a. & b.

6. Which variety of cheese has the distinctive characteristic of large gas holes throughout the cheese?
 - a. Swiss
 - b. Colby
 - c. Cheddar
 - d. Monterey

7. Which type of cheese has the distinctive process method of mold ripening throughout the interior of the cheese?
 - a. Cottage
 - b. Limburger
 - c. Blue
 - d. Colby

8. Which three cheeses were found to reduce tooth decay in laboratory rats?
- Cottage, cream, neufchatel.
 - Brie, camembert, brick.
 - Blue, limburger, roquefort.
 - Cheddar, swiss, monterey jack.
9. Federal Definitions and Standards of Identity specify the minimum levels of milk fat and solids-not-fat for the various milks shipped in interstate commerce. Whole milk contains:
- not less than 3.25 % milkfat and 8.25% solids-not-fat.
 - 0.3, 1.5 or 2.0% milkfat and not less than 8.25% solids-not-fat.
 - less than 0.5% milkfat and not less than 8.25% solids-not-fat.
 - not less than 18% milkfat.
10. Specific gravity of milk is 1.032 at 60 degrees F. This means that a certain volume of milk weights more than an equal volume of water. Water weights 8.34 lbs. per gallon. How much does a gallon of milk weigh?
- 10.0 lbs.
 - 9.5 lbs.
 - 8.6 lbs.
 - 8.36 lbs.
11. Under the federal milk marketing orders, the meaning of minimum price is:
- the minimum price that a producer can ask for milk produced.
 - the minimum price that a handler (milk processor or distributor) can pay a producer for milk.
 - the minimum price that a retailer can charge for milk.
 - all of the above.
12. A food obtained as a fluid by separating out the coagulum from milk, cream or skim milk is called:
- curd
 - casein
 - whey
 - protein
13. With reference to the marketing of milk, what is meant by the term "differential"?
- The difference between the cost of production and the price of milk.
 - The difference between the price of a pound of butter and a pound of butterfat.
 - The difference between the retail price of milk and the price paid to the producer for the same quantity.
 - The adjustment in price paid by handlers and received by producers to reflect the difference in distance of the producer from the handler and difference in milk composition.
14. The dairy industry has developed a program to identify milk, cheese and other dairy products made from U.S. produced milk that meets federal and/or state standards. Such products are identified by:
- the words "U.S.D.A. Approved".
 - the words "U.S.D.A. standard of Excellence".
 - the "Real" Seal.
 - Any of the above.

15. All but one of the following are proper storage conditions for cheese to retain its original flavor and appearance:
- Wrapped tightly to avoid exposure to air and subsequent drying out.
 - Store uncovered in a moist, dark area at temperatures between 55-65 degrees F.
 - Refrigerated (natural cheeses) at temperatures of 35-40 degrees F.
 - Pasteurization and addition of mold inhibitors used in processed cheese, cheese food, and cheese spread.
16. One of the following statements is not true about pasteurization of milk:
- A process named after Louis Pasteur.
 - Process involves heating milk to not lower than 145 degrees F. for not less than 30 minutes and promptly cooling, or the process can be accomplished by raising temperature followed by rapid cooling.
 - Pasteurization kills bacteria that may be present in milk.
 - The process improves the flavor of milk, but reduces the food value, particularly the itamin content.
17. One of the following is not a true statement with reference to the care of cheese by the consumer:
- Unopened jars of cheese spread will keep at room temperature for about three months, but once opened, it must be refrigerated and in a tight container.
 - Cheese that has dried out can be grated and stored in a covered container in a refrigerator.
 - Cheese generally possesses its most distinctive flavor at room temperature; therefore, except for cottage cheese, it should be taken from the refrigerator about 30 minutes before serving.
 - Cottage cheese is most desirable when heated to about 180 degrees F. for serving.
18. Most natural cheeses such as cheddar and Swiss can be successfully frozen for up to two months or longer. One of the following is not a true statement regarding freezing cheese:
- Weigh ten pounds or less per package.
 - Package be not more than one inch thick.
 - Be wrapped in airtight package.
 - Be frozen quickly at zero degrees F.
19. In the production of cheese, one of the first steps is to cause the milk to coagulate or clot. The coagulum is called:
- Butter
 - Whey
 - Curd
 - Buttermilk
20. One of the most significant factors controlling the properties of cheese such as firmness, time required for ripening, and length of shelf life is:
- Type of coagulating agent used.
 - Fat content.
 - Moisture content.
 - All of the above.

21. Dairy Management Inc. is:
- A newly formed board consisting of ten representative each from the National Dairy Board and the UDIA for the purpose of combining forces to promote marketing of fluid milk, cheese, butter, milkfat, increasing exports, and maintaining a positive dairy marketing environment.
 - A newly formed group in Iowa that oversees the operation of large dairy herds.
 - An organization that offers a consulting service to milk producers.
 - A new name proposed for DHIA by the National Dairy Promotion Board.
22. Who is regulated by a milk marketing order?
- Dairy farmers
 - Milk Handlers
 - Restaurant operators
 - Dairy product retailers
23. What are the objectives of a Federal milk marketing order?
- To assist farmers in developing a steady, dependable market by providing prices for their milk which are reasonable in relation to economic conditions.
 - To assure customers at all times of adequate supplies of pure and wholesome milk.
 - To regulate the price of milk so that consumers are always assured of a "cheap" food source.
 - Both a. and b. are correct.
24. Cheese is defined as:
- a milk product manufactured from whey.
 - a product developed from the serum of milk.
 - the fresh or matured product obtained by draining the whey after coagulation of casein.
 - all of the above.
25. The Food and Drug Administration (FDA) has defined a "substitute" food for cheese as being:
- a food that looks like, tastes like, and is intended to replace its traditional counterpart, but is nutritionally inferior.
 - a food resembling a standardized or traditional product and meeting the FDA's definition of nutritional equivalency comparisons.
 - a food that does not necessarily resemble a dairy food product but has equivalent nutrient value.
 - all of the above.
26. One of the following cheeses did not originate in the United States:
- Brick
 - Colby
 - Roquefort
 - Monterey Jack
27. During the calendar year 1994, the greatest number of dollars spent on advertising and sales promotion by the National Dairy Promotion & Research Board went for:
- Image of dairy products.
 - Fluid milk.
 - Butter.
 - Cheese.
28. According to the 1994 Annual Report of the National Dairy Promotion & Research Board the per capita consumption of cheese increased over 1993 by:
- 3.5 %
 - 7.0%
 - 14 %
 - 28 %

29. Butter has gained in consumption for the past three years. In 1994 the per capita consumption increased over the per capita consumption in 1993 by:

- a. 3.5 % b. 6.8 % c. 15 % d. 30 %

30. The United State's largest export market for dairy products is:

- a. Mexico b. Japan c. Canada d. Israel

1995
IOWA FFA DAIRY FOODS TEST

KEY

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|-----|---|-----|---|
| 1. | C | 16. | D |
| 2. | C | 17. | D |
| 3. | D | 18. | A |
| 4. | B | 19. | C |
| 5. | C | 20. | C |
| 6. | A | 21. | A |
| 7. | C | 22. | B |
| 8. | D | 23. | D |
| 9. | A | 24. | C |
| 10. | C | 25. | B |
| 11. | B | 26. | C |
| 12. | C | 27. | B |
| 13. | D | 28. | A |
| 14. | C | 29. | B |
| 15. | B | 30. | A |