

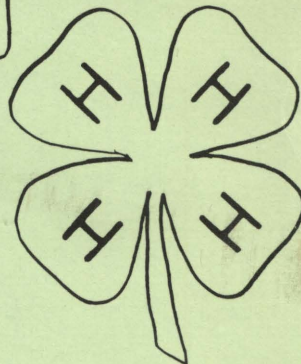
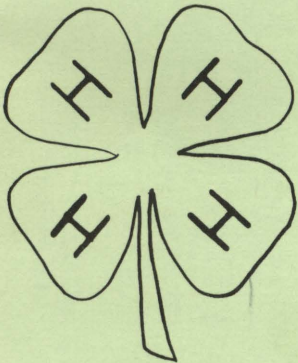
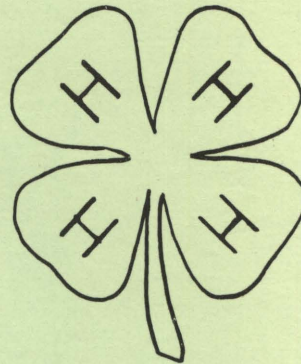
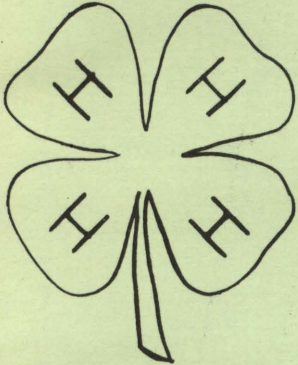
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Extension Division
V.P.I. & S. U.

DAIRY FOODS RECORD BOOK



"TO MAKE THE BEST BETTER"

NAME OF CLUB MEMBER _____

ADDRESS _____ Zip Code _____

BIRTH DATE _____ AGE _____

COUNTY _____ CLUB _____

NAME OF PROJECT LEADER _____

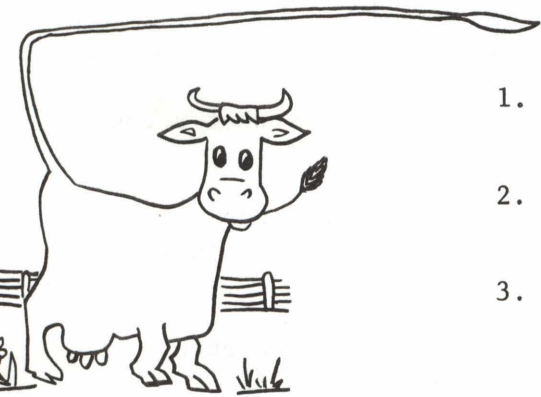
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Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. W. E. Skelton, Dean, Extension Division, Cooperative Extension Service, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.

OBJECTIVE AND REQUIREMENT

Through this project you should develop a greater understanding and appreciation for dairy foods. This record book is designed for 4-H members between the ages of 12 and 14 who expect to learn more about dairy products.

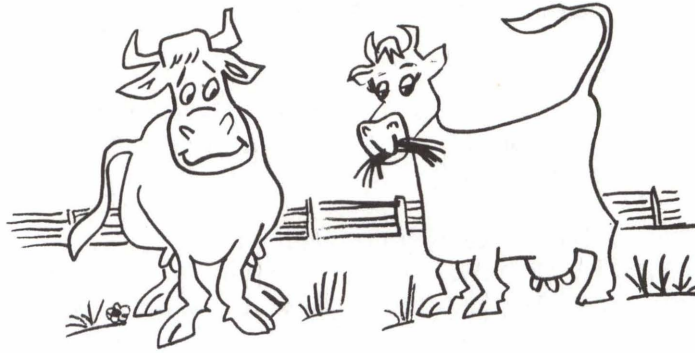
Study carefully this record book, keep your records up-to-date, and submit it to your Extension Agent at the end of the project year. Any segment could be done without having completed the previous segment. For example: The dairy products could be made before visiting a dairy plant, or vice versa.



POINTERS TO HELP YOU

1. Attend as many of your club meetings and take part in as many meetings as possible.
2. Ask questions of your parents, local leaders, or Extension Agents at any time.
3. Show this record book to your mother and father so that they will understand what you are doing in your 4-H dairy products work.
4. You may want to set up a homemade ice cream exhibit at a shopping center, serve refreshments at 4-H Club meetings, give illustrated talks or demonstrations or even conduct a dairy foods judging contest of products made by 4-H'ers.
5. Be proud of yourself, your project, 4-H, and American agriculture. Take advantage of its opportunities. Best wishes to you.

*A glossary of items is included in the back of this record book for your convenience.



COWS—MILK MAKERS

Everyone knows that cows give us the milk we drink, but can you imagine what a cow is really like?

A cow is gentle and makes very little noise. She moves about leisurely and spends most of her time browsing and resting. Still, her body is always busy making the milk you drink.

Each day a cow drinks from 10 to 20 gallons of water. In a year she eats about 3100 lbs. of mixed grains and concentrated feeds. Added to this are 2 1/2 tons of hay and 6 1/2 tons of silage, mostly made of chopped green corn and grasses. She also eats the grass from 2 or more acres of pasture.

A cow has not 1 but 4 stomachs to help her digest all this feed. When a cow tears off grass, she swallows it only half chewed. This partly chewed feed goes to her first stomach. Here the feed is softened by liquids and partly digested by stomach bacteria. It then moves to her second stomach. In her second stomach the feed is softened more and formed into small balls. Each ball of feed is called a cud and is about the size of a hen egg.

Later, the cow gulps the cud back up into her mouth. She chews the cud 40 to 60 times before she swallows it again. This finely chewed feed goes into her third stomach and is broken up still more. Finally the feed passes to the fourth stomach and is digested.

In return for all a cow eats, she will give around 3,500 quarts of milk in a year. Of the 305 days each year she is milked, she gives about 11 quarts of milk a day. A cow is not milked 60 days of the year for a good reason. This period gives her time to rest her body and to store body materials just before her calf is born. She gives birth to one calf yearly.

Beside giving milk and having calves, the cow has created jobs for thousands of men and women. Perhaps you know someone who works in the dairy industry or helps manufacture equipment or products used in a dairy plant or on a dairy farm.

DAIRY PRODUCTS

MILK

Milk has been described as "Man's most perfect food." It is nearly perfect because it is naturally mixed and compounded to satisfy the appetite and nourish the body. Milk is a liquid food, but it contains nearly thirteen percent solids. The solids in whole milk are composed of proteins, carbohydrates, minerals, and vitamins.

BUTTER

Butter contains natural milk fat. It is made by separating the cream from the milk in a separator and churning the cream until the fat clings together. The liquid left in buttermaking is buttermilk.

Butter can be made from either sweet or sour cream. The cream is pasteurized before churning. Butter's flavor is kept by careful churning, washing, salting, and testing.

Butter is rich in Vitamin A. When the milk fat is taken out of milk, it takes the Vitamin A dissolved in it. Vitamin A can be added to milk to take the place of any that is taken out.

ICE CREAM

Ice cream is a product of pure sweet cream, milk, skim milk, condensed milk, or other products. These products are combined with sugar, stabilizer, and varying amounts of flavoring, often fruit and nuts. Some of these same products are used in different amounts to make ice cream, ice milk, and sherbets. If eggs are added, the product is called frozen custard or French ice cream.

CHEESE

Cheese is made from milk. Cow's milk is used to make most of the cheese produced in the United States. Goat's milk is used widely in Norway and sheep's milk in France.

Most milk is pasteurized before it is used for cheesemaking. The solid portion of milk, called curd, is separated from the liquid portion, called whey. To get milk to form curds, special acid-producing bacteria are added to warm milk. These bacteria are allowed to grow until the milk has reached the degree of acidity necessary to permit the action of the coagulant rennin, a product added to make the cheese become solid.

The following affect the flavor and texture of cheese:

1. The kind of milk used.
2. The method for coagulating the milk.
3. How the curd is cut, cooked and formed.
4. The type of bacteria or mold used in ripening.
5. The amount of salt or other seasoning added.
6. The conditions of the ripening such as temperature, humidity and length of time.

There are ten distinct types of natural cheese.

Nutrients in a Quart of Milk

1 quart = four 8 oz. glasses*

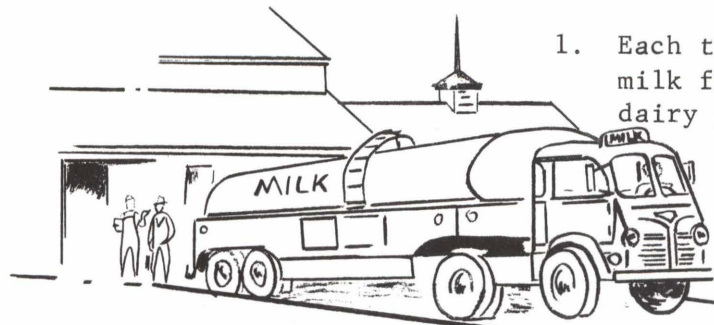
	Boys, 11-14 Years		Girls, 11-14 Years	
	<u>Allowance</u>	<u>% Supplied</u>	<u>Allowance</u>	<u>% Supplied</u>
Calories = 640	2800	22	2400	26
Protein = 44 mg	44	80	44	80
Calcium = 1152 mg	1200	95	1200	95
Vitamin A value = 1400 I.U.	5000	28	4000	35
Thiamine = 0.28 mg	1.4	20	1.2	23
Riboflavin = 1.64	1.5	100	1.4	100
Niacin equivalents = 0.8 mg	18	0.4	16	0.5
Ascorbic acid = 8 mg	45	17	45	17
Vitamin D = 400 I.U.	400	100	400	100

*Per day

For this age group (11 to 14), nutritionists recommend 4 glasses (1 quart) or more of milk a day.

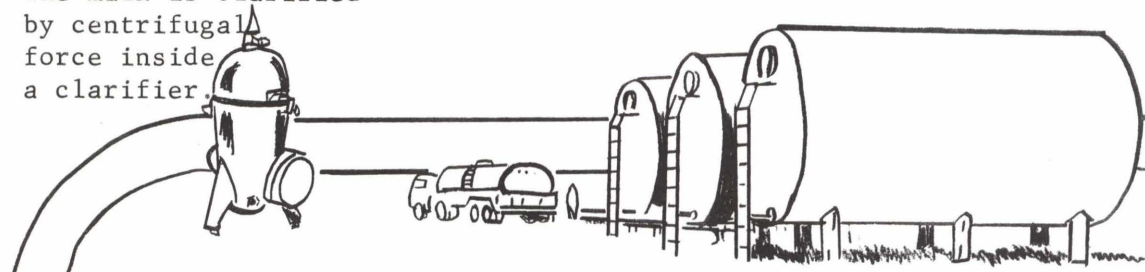
MILK FROM FARM

1. Each tank truck rushes cold milk from several farms to dairy plants.

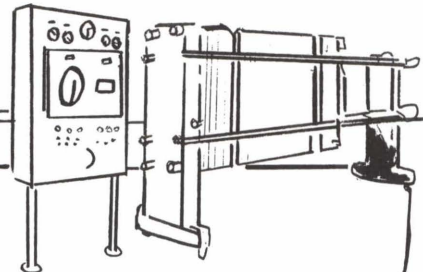


2. The cold milk is pumped from tank trucks through sterile pipes into refrigerated tanks ready for pasteurization.

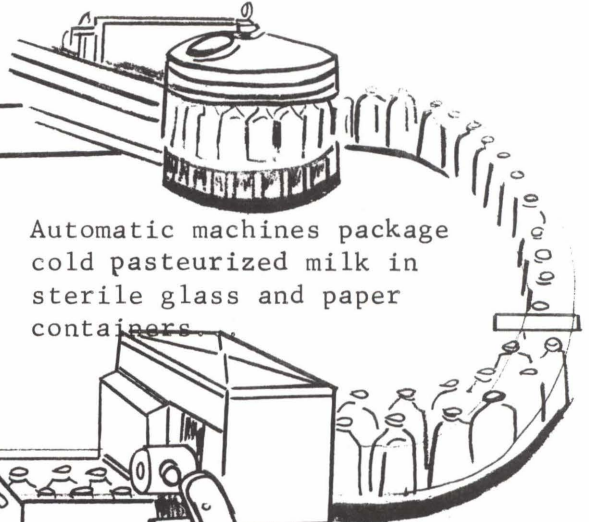
3. The milk is clarified by centrifugal force inside a clarifier.



4. All milk is pasteurized in thermostatically controlled equipment.

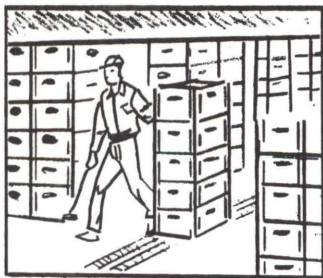


5. Automatic machines package cold pasteurized milk in sterile glass and paper containers.

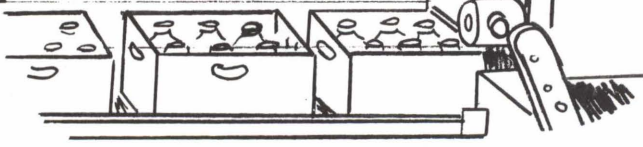


6. Conveyors rush the milk to a refrigerated room ready for delivery.

4a. Some is also homogenized.



5a...and put the containers into cases



7. Refrigerated trucks bring the milk to stores and homes.



TO FAMILY

A visit to a dairy plant will give you an opportunity to see the different processes and inspections through which milk passes before being packaged. Please note the questions on the next two pages before visiting a dairy and do the following questions:

Name of dairy -

Address

Draw a simple diagram on the flow of milk throughout the processing plant or list the steps the milk goes through from the time it is received to the time it is placed in the cooler.

Answer the following questions:

Why is cleanliness important? _____

Did the employees look neat and clean? _____

Did the dairy and equipment look clean? _____

What material were all the pipelines made of? _____

Why is this material used? _____

Identify or define the following:

1. H.T.S.T. _____

2. C.I.P. _____

3. Pure Pak _____

4. Sweet water _____

5. Class I and Class II milk _____

What did you learn in your dairy visit that you didn't know before?

What did you find most interesting in your visit to the dairy?

How much extra does the dairy charge to deliver a quart of milk to the home?

Home delivery sales have continued to decrease over the years. What would you do to increase home delivery sales?

Suggest a new product that you think dairies could make and sell.

Visit your local supermarket and do the following exercise

Name of store -

Location -

Assume milk can be purchased at the store for 48¢ a quart or less. Since drinks weigh 32 ounces per quart, we can say that milk would sell for 1½¢ an ounce or 24¢ a pound. Make a list of as many drinks as you can find which cost 1½¢ an ounce or less.

<u>Drinks</u>	<u>Cost</u>	<u>No. of Ounces</u>	<u>Cost/ Ounce</u>	Does the nutritional value of these drinks compare favorably with milk? (see page 4) <u>Yes or No</u>
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Listed below are 10 non-dairy foods which you commonly eat. List their prices per pound.

<u>Food</u>	<u>Price/ounce or lb.</u>	Is milk a better buy? <u>Yes or No</u>
1. Steak		
2. Hot dogs		
3. Baked beans		
4. Fresh vegetable		
5. Canned peaches		
6. Fresh fruit		
7. Cake or pie		
8. Bread		
9. Cereal		
10. Potato chips		

List the different types of milk found in the dairy case (Example: whole milk, chocolate milk, skim milk).

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

List the different sizes and types of containers found in the dairy case (Example: 1/2 pints, paper, glass, plastic).

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

List the different varieties of cheese found in the dairy case (Example: Swiss, sharp, cheddar).

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

List other dairy products found in the store (Example: yogurt, ice milk, sherbet).

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

List as many other food items as you can find which contain dairy products (Example: hot dogs, bread, etc.). Please look at the label and note the list of ingredients, such as dried milk solids.

- | | |
|-----------|-----------|
| 1. _____ | 14. _____ |
| 2. _____ | 15. _____ |
| 3. _____ | 16. _____ |
| 4. _____ | 17. _____ |
| 5. _____ | 18. _____ |
| 6. _____ | 19. _____ |
| 7. _____ | 20. _____ |
| 8. _____ | 21. _____ |
| 9. _____ | 22. _____ |
| 10. _____ | 23. _____ |
| 11. _____ | 24. _____ |
| 12. _____ | 25. _____ |
| 13. _____ | 26. _____ |













Teenage girls generally do not consume enough milk. If it was your job to increase the milk consumption of teenage girls, how would you go about it?

Calories in Dairy Products*

		<u>Food Energy Calories</u>
Fluid whole milk	1 cup	160
Fluid skim milk	1 cup	90
Fortified Skim milk	1 cup	110
2% low fat milk	1 cup	145
Buttermilk	1 cup	90
Chocolate milk	1 cup	210
Chocolate drink	1 cup	190
Evaporated milk	1 cup	350
Condensed milk (sweetened)	1 cup	980
Dry whole milk	1 cup	520
Nonfat dry milk	1 cup	245
Half and half	1 cup	320
Light cream	1 cup	510
Heavy cream	1 cup	840
Butter	1 cup	810
Cottage cheese	1 cup	170
Creamed cottage cheese	1 cup	260
Cheddar cheese	1 oz.	110
Cream cheese	1 oz.	110
Sour cream	1 cup	485
Yogurt	1 cup	120
Ice cream	1 cup	260
Ice milk	1 cup	200
Sherbet	1 cup	260

*Calorie is the unit for measuring the energy produced by food when oxidized in the body. One calorie is the amount of heat needed to raise the temperature of one gram of water one degree centigrade.

About How Much Milk It Takes To Make

	1 lb. of butter	9 3/4 qts. whole milk	
	1 lb. American cheese	4 2/3 qts. whole milk	
	1 lb. nonfat dry milk	5 qts. skim milk	
	2 cups cottage cheese	3 qts. skim milk	
	1 quart ice cream	1 1/2 qts. whole milk	
	2 cups evaporated milk	1 qt. whole milk	

General Information for Making Dairy Products

Since dairy products are very nutritious, bacteria can easily grow in them. Because bacteria can live and grow in dairy products, special care has to be taken in preparing them to keep bacteria away from them. To insure proper cleanliness always wash your hands thoroughly with soap and water.

All the utensils should be cleaned and then sterilized before use. The sterilization of the utensils can be accomplished by placing them in a large container, covering them with water and boiling the water for 10 minutes; or place the utensils in a container and pour boiling water over them, letting them sit in this water for 15 minutes.

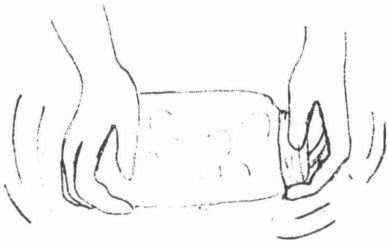
Cooling a dairy product is accomplished best by placing it in a glass container and setting this container into a larger container with cold water and agitating the product. In making dairy products, always use the freshest cream and milk available and you will enjoy some very nutritious and tasteful products.

Butter

Supplies needed:

1 pt. heavy cream or whipping cream	spoon
salt	knife
quart fruit jar and lid or bowl	glass container and larger container

1. Wash your hands thoroughly with soap and water.
2. Sterilize all the utensils you will be using.
3. Warm 1 pint of cream by placing it in a glass container and placing this container into a larger container which contains warm water.
4. Place the cream in a quart fruit jar which has been sterilized. Place the lid on the jar and shake vigorously until the emulsion breaks. The butter first appears as small butter lumps, and as you continue shaking these lumps get larger. (An alternate method would be to place the cream in a bowl and whip the cream until it turns to butter.)
5. Pour off the buttermilk and taste.
6. Rinse the butter by pouring cold water, preferably ice water, over the butter. Then remove the butter.
7. Sprinkle a little table salt on the butter and work it into the butter with a knife or a large wooden spoon, and then go spread some enjoyment into your life.



Step 4

Cultured cream or sour cream

Supplies needed:

1 pint light cream	thermometer
2 tbsp. instant nonfat dry milk	double boiler
2 tbsp. cultured buttermilk	quart fruit jar

1. Wash your hands thoroughly with soap and water.
2. Sterilize all the utensils you will be using.
3. Take one pint of fresh, light cream about 20 percent fat; pour into double boiler.
4. Add 2 tablespoons of nonfat dry milk; mix thoroughly.
5. Pasteurize the cream by heating it to 180°F in a double boiler; place lid on pan and leave for 30 minutes.
6. Pour into a one quart fruit jar which has previously been sterilized and cool quickly to room temperature or 70°F.
7. Add 2 tablespoons of cultured buttermilk obtained from the grocery store or your local dairy.
8. Allow to stand in a warm (70°F) quiet place where it will not receive any vibration until it coagulates, forming a firm curd, 6 - 12 hours depending on activity of your starter.
9. Place in refrigerator and cool.

Sour cream makes an excellent base for all sorts of appetizing dips, can be used as a dressing for baked potatoes, and as a base for blue or cheddar cheese salad dressing.

Flavored cultured buttermilk

Cultured buttermilk is the buttermilk sold in the stores today and is generally made from skimmilk. Real buttermilk is the fluid obtained in the process of making butter.

Supplies needed:

2 tbsp. cultured buttermilk	measuring cup
1½ cups nonfat dry milk	tablespoon
fruit or flavoring	quart fruit jar and lid OR
½ cup sugar	double boiler

1. Wash your hands thoroughly with soap and water.
2. Sterilize all the utensils you will be using.
3. Put 1½ cups of instant nonfat dry milk into a quart fruit jar, fill the jar with recently boiled water and mix it into a solution.
4. Place a lid on the jar and shake for about one minute or until all nonfat dry milk is in solution, or if using double boiler, mix until in solution.
5. Let cool to room temperature either by letting it stand in the room or by placing it in a pan of cold water and shaking.
6. When it reaches room temperature or about 72°F, add 2 tablespoons of buttermilk obtained from the store.
7. Replace the lid and shake for about one minute.
8. Let set at room temperature for 12 to 16 hours or until the milk has coagulated and formed a firm curd.
9. Cool the buttermilk by placing the container in a pan of ice water or refrigerator.
10. If you wish to make a flavored buttermilk, after cooling blend in with a spoon a fruit puree or topping (pineapple, strawberry, blueberry). A flavoring such as lemon or juices such as orange can also be used.
11. Add ½ cup of sugar or more if needed and enjoy a big glass of flavored buttermilk.

Flavored yogurt

Supplies needed:

1 3/4 cups instant nonfat dry milk	thermometer
3 to 5 tbsp. plain yogurt	quart fruit jar and lid
fruits or flavoring	measuring cup
	tablespoon

1. Wash your hands thoroughly with soap and water
2. Sterilize all the utensils you will be using.
3. Put 1 3/4 cups of nonfat dry milk into a quart jar, fill the jar with recently boiled water and mix it into a solution.
4. Cool to 110^oF.
5. Add 3 to 5 tablespoons of plain yogurt obtained from your local dairy or grocery store.
6. Shake vigorously for about one minute.
7. Place the jar in a pan of water which is maintained at approximately 108^oF. Allow the milk to ripen at that temperature until the milk has coagulated into a firm curd, about 5 hours.
8. Remove the jar from the water bath and chill by placing in refrigerator or in a pan of ice water.
9. For flavored yogurt blend in one cup of fruit preserves such as strawberry, pineapple, or blueberry. Flavoring such as lemon, vanilla, etc., can also be used.

Yogurt may be eaten as is, as a custard with berries, peaches, seasoned with salt and chives or chopped onions; or as a topping for fruit.

Ice Cream

Using Ice Cream Dasher Freezer (will make about 2 quarts)

2 eggs	1 tbsp. vanilla extract
1 cup sugar	2 cups cream
$\frac{1}{2}$ tsp. salt	1 qt. milk
2 tbsp. nonfat dry milk	

1. Beat eggs.
2. Add 1 cup sugar, $\frac{1}{2}$ tsp. salt, 2 tbsp. nonfat dry milk, and 1 tbsp. vanilla extract. Continue to mix.
3. Fold in cream and add 1 qt. of milk.
4. Make sure freezer is working properly by giving it a few turns while it is empty.
5. Pour the mixture into the freezer container. Do not fill the container more than $\frac{2}{3}$ full. This will allow for expansion when the mix is frozen and air is incorporated. Insert the dasher and put on the cover.
6. Surround the container with alternate layers of crushed ice and rock salt, using 6 parts of ice to 1 part of salt.
7. Turn crank slowly for 3 or 4 minutes, then turn it rapidly until the mixture is stiff and almost impossible to turn.
8. Remove ice and salt from cover--wipe dry.
9. Remove cover carefully. Lift out dasher and scrape the ice cream down into the can with a spoon.
10. Cover the top of the ice cream container with waxed paper, replace the cover, and cork up the hole in it.
11. Drain off melted ice and pack in alternate layers of 4 to 6 parts of ice to 1 part of salt. Cover whole freezer with newspapers to retard the melting of ice.
12. Allow the ice cream to stand for 2 to 3 hours to ripen and mellow. If necessary, drain off melted ice and repack in same proportion as in step 11.

Ice Cream

Using Refrigerator Trays (serves 8 to 10)

1 envelope unflavored gelatin	1½ teaspoons vanilla
2 well-beaten egg yolks	2 cups whipping cream
¾ cup sugar	2 egg whites
¼ teaspoon salt	¼ cup sugar

1. Soften gelatin in ¼ cup cold water. Dissolve over hot water.
2. Combine the 2 well-beaten egg yolks, ¾ cup of sugar, ¼ tps. of salt, 1½ tps. of vanilla, and 2 cups of whipping cream; add gelatin; mix well.
3. Freeze in refrigerator trays.
4. Beat egg whites to soft peaks; gradually add ¼ cup sugar, beating to stiff peaks.
5. Break frozen mixture in chunks; beat till fluffy with electric mixer.
6. Fold in egg whites.
7. Return to cold trays; freeze firm.

Flavorings for Ice Cream

Any of the following flavors may be added to the recipes given.

1. Chocolate - Make a chocolate syrup by mixing 1¼ oz. cocoa, 2¼ oz. sugar, and 4 oz. water. Heat to boiling and cool. Add to mix prior to freezing.
2. Fruit and nut - Add chopped nuts or crushed fruit, either fresh, frozen, or canned to suit the taste. Add these at any time during the freezing operation.
3. Caramel - Substitute ½ cup sugar and ½ cup caramel syrup for the 1 cup sugar given in the recipes.
4. Macaroon - Add about 2 cups macaroons, measured after drying and crushing. Grape-nuts or dried sifted cake crumbs may be used in place of macaroons.
5. Butterscotch - Substitute brown sugar for granulated sugar. Cook sugar with 5 tablespoons butter until melted, boil 1 minute and add to mix.

Sherbet

Supplies needed:

1½ cups milk	1 teaspoon gelatin
2½ cups water	*flavoring (see below)
2 cups sugar (or less to suit taste)	

1. Mix gelatin thoroughly with water.
2. Put milk and water in pan and heat.
3. When hot, add sugar and gelatin mixture until dissolved.
4. Bring to boil for 1 minute.
5. Remove from heat and cool.
6. Add desired flavor and freeze in dasher freezer.

*Flavorings:

¾ cup of lemon juice	2 cups of strawberries
2 cups of orange juice	2 cups of blueberries
2 cups of raspberries	

Ice Milk

Substitute the same amount of milk in place of cream in any recipe given for ice cream. In addition, add 2 tbsp. nonfat dry milk to the recipes making 2 quarts (and 4 tbsp. to those which make 3 ¾ quarts) to improve the body of the finished products.

TURN ON TO YOUR OWN DAIRY FOODS

1. Make some butter and comment on the flavor of the butter and the buttermilk.

2. Make one of the following cultured dairy foods and give details as to fruit or flavoring used, how you used the product and your evaluation of the product:
 - a. Flavored buttermilk
 - b. Flavored yogurt
 - c. Sour cream

3. Make two of the following frozen dairy foods and give details as to fruit or flavoring used and your evaluation of the product as compared to the product you buy at the store:
 - a. Ice cream
 - b. Ice milk
 - c. Sherbet

4. Give your 4-H Club a demonstration of how one of these products is made or give some of the products you have made to your club members for them to evaluate.

5. Write an article about milk or some dairy food. Suggested topics are:
- a. The History of (a particular dairy food)
 - b. How (a particular dairy food) Is Made
 - c. The Nutritional Value of (name of dairy food)
 - d. A combination of the topics suggested in a,b, and c.
 - e. My First Experience with Dairy Foods (preparing or purchasing)

GLOSSARY

Buttermilk is a fluid product resulting from the manufacture of butter from milk or cream.

Chocolate Dairy Drink is skim or partially skimmed milk flavored with a chocolate syrup or powder.

Concentrated Milk or Condensed Milk is a fluid product, unsterilized and unsweetened, resulting from the removal of a considerable portion of the water from milk.

Condensed Skim Milk is a fluid product made by concentrating the solids from skim milk in a vacuum pan. The total solids content will be 27 to 30%.

Cream is the sweet, fatty liquid separated from milk which contains not less than 18% milkfat.

Cream Cottage Cheese is made by coagulating the protein in pasteurized skim milk. After cooking and washing the curd, which cannot exceed 80% moisture, it is mixed with a creaming mixture so the finished product contains not less than 4% milkfat.

Cultured Buttermilk is a fluid product resulting from the souring, by lactic acid-producing bacteria, of pasteurized skim milk or lowfat milk.

Filled Milk is a product made by combining fats or oils, other than milkfat, with other milk solids.

Fluid Milk is that milk which has been pasteurized and offered for sale in bottles, jugs, or cartons.

Fortified Milk and Milk Products are milk and milk products other than vitamin D milk and milk products, the vitamin and/or mineral content of which have been increased by a method and in an amount approved by the health authority.

Evaporated Milk is made from homogenized whole milk in which over half the water is removed in the evaporating process. The milk is sealed in cans and then sterilized by heat. Vitamin D is usually added.

Half and Half is a product consisting of a mixture of milk and cream which contains not less than 10.5% milkfat, but less than 18% milkfat.

Heavy Cream or Heavy Whipping Cream is cream which contains not less than 36% milkfat.

Homogenized Milk is whole milk which has been treated mechanically to break up the fat globules, spreading them permanently throughout the milk.

Ice Cream is frozen dessert which contains not less than 10% fat and not less than 20% S.N.F.

Ice Milk is a frozen dessert which contains not less than 2% nor more than 7% fat and not less than 11% S.N.F.

Light Cream, Coffee Cream or Table Cream contains between 18 and 30% milkfat.

Light Whipping Cream contains between 30 and 36% milkfat.

Lowfat Milk contains between 1 and 2% milkfat and not less than 8 1/4% S.N.F.

Milk is the lacteal secretion obtained from healthy cows, which contains not less than 8 1/4% S.N.F. and not less than 3 1/4% milkfat.

Nonfat Dry Milk or Dry Skim Milk is made by removing the moisture (water) from skim milk. About 2/3 of the water is removed by boiling under vacuum conditions; the remainder is removed by spraying the concentrated skim milk into a hot air chamber.

Pasteurization kills harmful bacteria if any should be present. There are two approved ways to pasteurize milk. In the high-temperature short-time method (HTST) milk is heated to 161 degrees Fahrenheit for at least 15 seconds and emerges cooled to about 35 degrees. The process takes about two minutes and is completed in one machine. In the alternate method, milk is heated to 145 degrees for at least 30 seconds, then cooled rapidly.

Raw Milk is the milk as it comes from the cow.

Sherbet is a frozen dessert which contains between 1 and 2% milkfat and not less than 2% M.S.N.F.

Skim Milk or Skimmed Milk is milk from which sufficient milkfat has been removed to reduce its milkfat to less than 1/2%.

Solids-Not-Fat (S.N.F.) is the total solids minus the fat. They are also known as Milk-Solids-Not-Fat (M.S.N.F.) or serum solids. The total solids (T.S.) minus the fats is the M.S.N.F.

Sour Cream or Cultured Sour Cream is a fluid or semifluid cream resulting from the souring by acid-producing bacteria.

Sweetened Condensed Milk is milk in which sugar is added before the evaporation process is started. Sugar acts as a preservative. The milk is sealed in cans and can be stored without further heat treatment and without refrigeration.

Synthetic or Complete Imitation Milk is made with a combination of fats or oils other than milkfat with vegetable solids or sodium caseinate.

Total Solids (T.S.) is what is left after all the water has been evaporated off. Milk - water = T.S. The total solids represent the food solids of milk.

Vitamin D Milk is milk in which the vitamin D content has been increased by an approved method to at least 400 IU units per quart.

Whipping Cream is normally "heavy cream" which contains not less than 36% milkfat.

Yogurt is a fermented dairy product made from whole or partially skimmed milk enriched with added milk solids-not-fat. Fermentation is accomplished by a mixture of two bacteria, Streptococcus thermophilus and Lactobacillus bulgaricus.

4-H LEADER GUIDELINES

This dairy foods project book was created to help young people obtain a better understanding of dairy foods. We feel these projects could be completed by any 4-H'er; however, it was aimed to appeal to the 12 to 14 year old. If any difficulty is encountered in making any of the foods, do not hesitate to contact the Department of Food Science and Technology, VPI&SU, Blacksburg, VA 24061.

We feel that the visit to the dairy as an integral part of the project book and, therefore, we would encourage every 4-H member who works on the book to visit a dairy. The names of many dairies you may wish to visit are listed below:

R. W. Gilbert, Gen. Manager
Alexandria Dairy Products Co.
Springfield

R. Allen, Gen. Manager
Beatrice Foods Co.
Radford

T. C. Hawkins
Birtcherd Dairy, Inc.
Norfolk

J. C. Cole, Owner
Coles Dairy
Appamattox

J. O. Cambell, Gen. Manager
Curles Neck Dairy, Inc.
Richmond

M. White, Manager
Economy Stores, Inc., Dairy Division
Norfolk

J. W. Nussey, Jr., Pres.
Greenleaf Dairy, Inc.
Colonial Heights

James E. Schad, Manager
Flav-O-Rich
Lynchburg

T. E. Neal, Jr., Gen. Manager
Marva Maid Dairy
Newport News

C. K. Rockfeller, Manager
Miller's Dairy, Inc.
Norfolk

Betty Sue Jessup, Pres.
Monticello Dairy, Inc.
Charlottesville

W. H. Jenkins, Regional Manager
Pet, Inc.
Roanoke

Charles Morrison, Manager
Pet, Inc.
Big Stone Gap

John Sandidge
Farmbest, Inc.
Bristol

Emmitt Dozier, Manager
Richmond Foods Stores, Inc.
Richmond

F. W. Lawrence, Dist. Manager
Sealtest Foods
Richmond

Hugh I. Coons, Manager
Sealtest Foods
Norfolk

C. Trent, Manager
Sealtest Foods
Roanoke

Fred Scott, Manager
Shenandoah's Pride Dairy
Winchester

Frank Rennie, President
Va. Dairy Co., Inc.
Richmond

H.H. Scott, Gen. Manager
Valley of Va. Coop. Milk Producers, Inc.
Harrisonburg

K. Bowling
Fairmont Foods
Bluefield

