

# **4-H Consumer Dairy Project Manual**



**This manual belongs to:**

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**Club:**

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**Purdue Extension Hancock County  
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Greenfield, IN 46140  
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## **Exhibit Requirements**

Grade 3 – Exhibit a 22” x 28” poster showing the five major dairy breeds. Include on the front of the poster the “Dairy Breed Information Sheet” which is included in this manual. Visit a dairy farm in order to complete the information sheet.

Grade 4 - Exhibit a 22” x 28” poster showing at least two products for each of the four types of storage for dairy products: frozen, refrigeration, canned, and dried. Include on the poster the “Storing Dairy Products Fact Sheet” that is included in the manual. (You must make a price per serving comparison on three different sizes of a single dairy product in order to complete the fact sheet.)

Grade 5 - Exhibit a 22” x 28” poster illustrating the steps included in production of dairy products from the farm to the home. Include on your poster a summary detailing the services you pay for at each step along the way.

Grade 6 – Exhibit a 22” x 28” poster illustration the nutritional aspects of dairy products. These should include calorie content, vitamins and minerals, as well as high and low fat content. Some ideas of things to include are:

- How dairy products fit into a low cholesterol diet
- How nutrition in dairy products relates to the human body
- How the high and low fat dairy products compare in the way they are manufactured and their nutritional content.
- How or why the calcium in dairy products is important to human nutrition and best source of dietary calcium
- The importance of dairy products in the protein needs of performing athletes.

Grade 7 – Plan and prepare a family meal or a cookout featuring dairy products including food from all four food groups (check old). Exhibit a poster showing this project in action using pictures, recipes, etc.

Grade 8 – Exhibit a poster showing some of the by-products of the dairy industry. Attach to this poster more complete list of by-products and their uses.

Grade 9 – Make a poster showing several dairy advertisements. Include your own evaluation of the ads and whether they would motivate you to purchase the product. You may also include a summary of how you think advertising has affected our dairy product consumption.

Grade 10 – Create an original advertisement for dairy. Include a brief summary of where you think the ad should be used, what audience you are trying to reach, and why you chose this specific approach. Explain how you think this ad will motivate the consumer to purchase more lamb. Include a label in the lower right hand corner giving your name, club, and grade.

Grade 11-12 – Make a poster highlighting a specific aspect of dairy that interests you. Be complete and thorough in your research and information.

## 4-H Consumer Dairy

Dairy Cattle bred primarily for milk production, originated in Europe. Distinct breeds were developed in different countries and often were named for those countries or their provinces. Some breeds date back several hundred years, others were developed as recently as the eighteenth century.

Dairy cows were introduced into the United States in the 16<sup>th</sup> century. And, because the dairy cow is an efficient producer of nutritious milk, the dairy cow population is now nearly 11 million cows (check).

Most dairy cows in the United States descended from five major breeds. These are:

### Holstein-Friesian Breed



The Holstein-Friesian breed originated in the Netherlands, mainly in North Holland and Friesland and in Oldenburg, Germany where black and white cattle predominated. Cattle from these areas were imported into the United States from 1850 to 1886. These formed the beginning of the Holstein-Friesian breed in the United States.

Holstein cattle are easily recognized by their black and white color. Some animals are nearly white, having only a few black spots. Others are nearly black, but have white under the body, on lower portions of the legs, and a white switch (long hairs at the tip of the tail.) Holstein cattle have other distinctive characteristics. They are the largest of the dairy breeds. Because of their size, they consume large quantities of feed. In milk production they rank first in the amount produced, 6,726 pounds, the fat content is lowest of all breeds with 3.7%. They also have a low (3.2%) protein content. The milk is generally white and the fat globules are small.

### Jersey Breed



Jerseys came to the United States from the Isle of Jersey, another of the islands in the English Channel. It is assumed that this breed originated from the cattle transported to Jersey from Brittany and Normandy. The first Jerseys to be registered in the United States were imported in 1850. The characteristic color of the Jersey is some shade of fawn such as tan, red, brown, gray, mulberry or

black and may have white markings. They have either a black or white switch or a mixture of the two. Jerseys are small cows. They weigh 900 pounds when mature. They are alert and very obedient if properly handled. The amount of milk produced is the lowest of the dairy breeds, 11,283 pounds, but it has the highest butterfat (4.8%) and the highest protein (3.8%) and is known as the richest milk. The milk is

yellowish white and has large fat globules that can cause the cream to rise rapidly and form a distinct cream line.



### Guernsey Breed

Guernseys came to the United States from the isle of Guernsey an island in the English Channel off the coast of France in 1831. Their color is a shade of reddish or golden fawn with white markings. A majority of the animals are predominately fawn with a small amount of white. The skin color around the eye and muzzle is generally golden yellow or pink, but may be black. The cows are a

little larger than the Jersey cows, but not as large as the other breeds. weigh 1,150 pounds when mature. In general, Guernseys are docile. They produce a slightly greater amount of milk than the Jerseys, 12,067 pounds, but the butterfat (4.7%) and protein (3.6%) content is slightly lower. Their milk is a distinctive golden color because of carotene. Guernsey milk possesses Vitamin A because the Guernsey cows are capable of transmitting large amounts of carotene, the source of Vitamin A. (Four glasses of Guernsey milk has the equivalent nutrients of five glasses of other milk.) The fat globules are larger, the cream rises rapidly, and the cream line is distinct.



### Ayrshire Breed

The Shire of Ayr in Scotland is the native home of Ayrshire cattle. This breed was developed from cattle in England and Scotland during the eighteenth century; therefore the breed is not as old as the Holstein, Jersey, and Guernsey. Few Ayrshire cattle came to the United States before 1900. The characteristic color is red and white, with the red color varying from a light or brownish

shade to a very dark mahogany. This breed is smaller in size than the Holstein and larger than the Guernsey. They weigh 1,200 pounds when mature. Ayrshires are alert, with tendency towards nervousness in some strains. The average milk production and the butterfat content of the milk lie between Holstein and Guernsey; 13,795 pounds of milk, 4.0% butterfat, and 3.4% protein. The milk is white, and the fat globules are relatively small.

## Brown Swiss Breed



Brown Swiss came to the United States from Switzerland in 1869. They are a very old breed and were developed as beasts of burden as well as producers of milk and meat. For many years, the Brown Swiss was not considered a dairy breed in the United States because of its meat-producing characteristics. It was improved in dairy qualities during the early part of the twentieth century, then it became recognized as one of the five main dairy breeds. The Brown Swiss are solid brown varying from very light to dark. They weigh 1,500 pounds when mature. It is a very docile breed, sometimes almost sluggish. In quantity of milk produced, butterfat content, color of the milk, and fat globule size, they are slightly about Ayrshires, averaging 14.447 pounds of milk, 4.1% butterfat, 3.6 % protein.

In general the larger the breed, the more volume of milk they produce per cow, but the lower the percentage of butterfat and protein in the milk. Today, the average dairy cow produces approximately 12,000 to 14,000 (24,000 glasses) of milk for human consumption a year.

Most heifers are bred to freshen at two years of age. After they give birth, they join the dairy herd and produce milk. The male calves are sold to feedlots, where they are fed until they are taken to market for their meat.

Dairy cattle are ruminant animals with four compartments in their stomachs; their digestive tract is the same as beef cattle. Dairy cows weigh 1,300 to 1,500 pounds and are fed high-quality feed. They eat grains such as ground corn, grain sorghum, oats and soybean meal.

Dairy cows also are fed forages, such as high-quality alfalfa and whole corn plants (silage). A single cow can consume up to 20 lbs. of grain and 75 lbs. of hay each day. Water is another important nutrient for dairy cows; every day they need to consume about 29 gallons of water or the equivalent of a full bathtub.

Many dairy producers use computers in their feeding operations. The computer reads the cow's identification and gives her a proper mix of grains, vitamins and minerals. This is determined by her age and how much milk she produces.

Nintey-nine percent of all dairy cattle in the U.S. today are of the Holstein breed, which are large-bodied with a black-and-white coat. In Nebraska, 90 percent of dairy cattle are Holsteins which give a large quantity of milk. The smaller-bodied breeds – Guernsey, Jersey and Brown Swiss – give a high protein milk.

## Dairy Nutrition

Milk is described by many as “nature’s most nearly perfect food.” Dairy products are recognized by scientists as one of the four basic food groups needed by all of us for a balanced diet. Dairy products give a growing child a solid foundation for strength, health, and energy. Doctors recommended that children drink three to four cups of milk a day to insure their calcium and trace minerals needed. Milk is just as essential for adults. Dairy products enrich the blood to give the body additional energy and increase resistance to germs. Milk and milk products provide nutritional balance to any diet and supply adequate amounts of natural vitamins.



Milk and other dairy products provide 70 percent of the calcium in the United States food supply, plus energy, protein and vitamins. Chocolate milk is made by adding sweetener and chocolate or cocoa to whole milk and is an alternative for people who don't drink white milk.



Cheese, butter, ice cream, yogurt and sour cream are also made from milk. It takes 10 pounds of milk to make one pound of cheese.

In 1865, a Frenchman named Louis Pasteur began his experiments that led to the discovery of the process we call pasteurization. This process kills harmful bacteria and has made it possible for all of us to enjoy cool, safe, and wholesome milk.

A technological development now permits milk to be heat-treated at very high temperatures (285 degrees Fahrenheit) for a fraction of a second (0.5 sec.). When this heat-treated milk is placed in an airtight package, the milk will keep for up to six months at room temperature. This type of processed milk is called Ultra High Temperature (UHT) milk. UHT milk will be handy for backpacking, summer cottages, emergency storage supply, and for people who live in remote areas. The UHT milk should be cooled before drinking to improve the taste and be refreshing. Once the airtight package is opened, the unused milk should be kept under refrigeration.



## From Farm to Grocery Store

Let's take a trip to the farm and watch from the beginning. The cows start things off by eating lots of green grass and grain. After her calf is born, a cow begins producing milk. This is called "freshening." A cow can only freshen after she has given birth to a calf.

The first milk the cow gives is called colostrum, which contains the nutrients and antibodies that the calf needs to stay healthy. The calf is weaned immediately after birth and fed the mother's milk with a large nursing bottle.

Cows are milked by machine, usually twice a day, every 12 hours. If they are milked at 3 p.m., they must also be milked at 3 a.m. Cows are milked for 305 days or about 10 months. Then the cow's body needs to rest and store nutrients before she has her next calf. After the calf is born, the cow will resume giving milk.



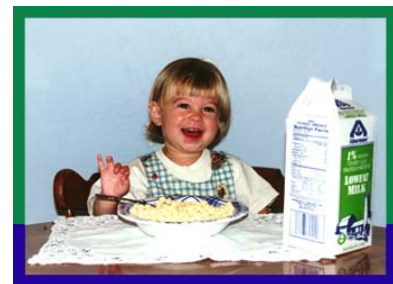
Milk is stored in refrigerated tanks at the dairy farm until it is picked up by a refrigerated tank truck and taken to a dairy processing plant. The farmer is paid according to how many hundred pounds of milk he has to sell.



At the plant, the milk is unloaded and sent through big, spotlessly clean pipes into giant storage tanks and is ready for pasteurization. This process assures us that the milk is absolutely safe. Some of the milk is homogenized, which means that the rich butterfat is broken up into small parts by machine and spread evenly throughout the milk.

After the milk is pasteurized, it is cooled and then flows through the machine that fills and seals the plastic bottle and cartons. These containers must be completely clean.

In a matter of hours, the bottles and cartons are ready for their final inspection. They are packed into cases and taken to the refrigerator room. Then the cases of milk are taken from the refrigerator from and loaded into delivery trucks. The trucks take the milk to the grocery store, convenience store, or restaurant where you buy milk to drink.



**For a virtual tour of a milk farm visit [www.moomilk.com](http://www.moomilk.com).**

## Dairy Breed Information Sheet

### Grade 3

1. The \_\_\_\_\_ cows are the largest of the dairy cows.
2. \_\_\_\_\_ Cows are capable of transmitting large amounts of carotene in their milk.
3. Cows which are black and white in color are called \_\_\_\_\_.
4. The \_\_\_\_\_ cattle were developed as beast of burden as well as producers of milk and meat.
5. A distinct cream line is found on the milk of both \_\_\_\_\_ and \_\_\_\_\_ breeds.
6. The \_\_\_\_\_ cows are the smallest of the dairy breeds.
7. \_\_\_\_\_ cattle are characteristically red and white in color.
8. \_\_\_\_\_ breeds rank first in milk production.
9. \_\_\_\_\_ breeds rank first in butterfat production.
10. \_\_\_\_\_ breeds rank first in protein production.
11. List the name of the dairy farm you visited:  
\_\_\_\_\_
12. Number of cows milked the day you visited: \_\_\_\_\_.
13. What are the times of milking at the farm you visited:  
\_\_\_\_\_.



**Storing Dairy Products Fact Sheet**  
**Grade 4**

1. Explain how milk should be stored: \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_ increases in acidity during storage.  
For best flavor, use within three or four days.

3. Store \_\_\_\_\_ mil in unopened cans in a cool, dry place. After opening, store covered in a refrigerator. Use within four to five days.

4. \_\_\_\_\_ milk should be stored in a cool dry place. It is preferable not to store it longer than six months. After opening, it remains in good condition for at least ten days.

5. Where should you store instant nonfat dry milk and how long can it be stored? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. How should cheese be stored? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

7. Tell about the price per serving comparison of a dairy product in three different sizes. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Much of the information in this manual was adapted from the following sources:

Nebraska AG in the Classroom Website, *Dairy Cattle*, [www.fb.com/nefb/ag-ed/dairy.html](http://www.fb.com/nefb/ag-ed/dairy.html)

MooMilk: A dynamic adventure in the dairy industry  
<http://www.moomilk.com/index.html>.

*Learning About Dairy*. A Cooperative Extension Service Publication, 4-H 125R. pp. 41-46.

# Consumer Dairy Record Sheet

Name \_\_\_\_\_ Grade \_\_\_\_\_

Name of Club \_\_\_\_\_ Year \_\_\_\_\_

Year in Consumer Dairy \_\_\_\_\_

Signature of Leader \_\_\_\_\_

What activities did you complete for your project?

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What did you learn about consumer dairy this year?

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How much time did you spend on this project this year?

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What things will you do differently as a dairy consumer as a result of this project?

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