SOLE Sciences of Life Explorations: Through Agriculture Grades 4 and 5



Teacher Guide Unit: Dairy Farms

UNIT PLAN

UNIT TITLE Dairy Farms

MONTH

November

GOAL

Students will be aware of New York State's importance in the U.S. dairy industry. They will consider crops, feed, housing, and pests and how they affect dairies. They will also learn about dairy farmers' schedules, the challenges they face, and the skills they need to overcome them. Finally, they will learn about IPM practices on the dairy farm.

OBJECTIVES

Students will:

- 1. Identify milk as a major agricultural commodity in New York State. (Food and Fiber Systems Literacy I: Understanding, C 4-5)
- Identify the skills a farmer needs to overcome obstacles and achieve goals in his or her career. (NYS Learning Standard 1: Career Development, Elementary 1 and Food and Fiber Systems Literacy I: Understanding, E 4-5)
- 3. Apply basic math skills to answer two-step problems (NYS Learning Standard 3a: Universal Foundation Skills, Elementary 1)
- 4. Recognize the ways that humans affect their environment by learning about IPM practices. (NYS Learning Standard 4: Science, Elementary 7: Living Environment)
- 5. Evaluate, by comparing and contrasting, how United States agriculture has evolved from pioneer days to today, and understand how these changes are due to better technology and changing consumer demands. (NYS Learning Standard 1: History of the United States and New York, Elementary 2 and Food and Fiber Systems Literacy I: Understanding, E 4-5)
- Explain how European settlers brought dairy animals to the United States, and how climate and population affected dairy farming. (Food and Fiber Systems Literacy I: Understanding, D 4-5)
- Recognize the role of marketing in the sale of dairy products. Understand that consumers often consider health benefits when purchasing foods. Demonstrate understanding by creating a food label. (NYS Learning Standard 4: Economics, Elementary 1 and Food and Fiber Systems Literacy V: Food, C 2-3, 4-5)
- 8. Assess and gather information about the challenges a dairy farmer faces, in order to creatively write a short diary entry. (NYS Learning Standard 2: Language for Literary Response and Expression)
- Explain why pests must be controlled and brainstorm safe and effective methods according to IPM practices. (NYS Learning Standard 1: Analysis, Inquiry, and Design, Elementary 1: Scientific Inquiry and Food and Fiber Systems Literacy III: Science, Technology, and the Environment, C 4-5)
- 10. Understand the concept of a life cycle, and that life is sustained through reproduction and development, using the fly as an example. (NYS Learning Standard 4: Science, Elementary 4 Living Environment)
- 11. Explain how technology has allowed the dairy farmer to become more **efficient** in the production of milk by reducing labor and production time. (Food and Fiber Systems Literacy III:

TERMS

These terms are highlighted in **bold** throughout the lesson pages.

Agricultural technology- technology used to improve crop and animal care Beverage - a drink **Biological control** - controlling a pest by using its natural enemies **Bodily fluids** - any liquid substance from a body (tears, saliva, mucus, sweat, etc.) **Decay** - the breaking down of natural material (organic matter) **Domesticated** - animal or plant that has been tamed and is no longer wild Efficient - taking less time or effort to accomplish the same job **Free-stall barn** - a type of barn where the cow is not tied to a particular stall. **Larva** - a wormlike baby fly (maggot), in the second stage of fly growth (plural **larvae**) Milkman - a person who sells milk door to door for a living Milking parlor - an area where cows are milked **Parasite** - an organism that lives off another organism without providing anything in return. **Pasteurize** - to heat milk to high temperatures in order to kill bacteria **Predator** - an animal that hunts and eats other animals **Ruminant** - Animal (including cattle, sheep, and goats) which has a 4 compartment stomach. **Pupa** - the transforming stage between **larva** and adult; wrapped in a covering (plural **pupae**) **Sanitary** - clean and safe for the health of animals and people **Selective breeding** - breeding animals for a certain trait, like milk production Silage - animal feed that can be stored through the winter **Threshold** - the limit or point where something becomes a problem Tie-stall barn- a type of barn where each cow is tied in their own stall

Integrated Pest Management is a specialized form of environmental management wherein scientific research and real world application work together to reduce pests such as insects, diseases or weeds.

- 1. Properly identify pests
- 2. Learn the pest/ host biology
- 3. Sample the environment for pests
- 4. Determine an action threshold
- 5. Choose the best tactic
- 6. Evaluate results

SAFETY

There are no specific safety concerns for this lesson. Follow standard classroom safety practices.

Standards Matrix for this Lesson:

	Standards:									
Month	Unit	Math/Science/and Technology	English Language Arts	Social Studies	НЕАLTH	ARTS	Food & Fiber Literacy	CDOS	Other Languages	Interconnectedness
11	Dairy Farms	4:10 e7	1:1 e1	1:14 e2			I: C 4-5			
		3a:2 e1	2:4 e1	4:17 e1			I: E 4-5			
		1:7 e1					l: D 4-5			
		4:10 e4					V: C 2-3			
							V: C 4-5			
							III: C 4-5			
							III: D 4-5			

Standards Matrix Key:

NYS Learning Standards arranged by Standard: Category, Level

e = elementary; i = intermediate

Categories:

- 1 Career Development
- 2 Universal Foundation Skills
- 3 Language for Information and Understanding
- 4 Language for Literary Response and Expression
- 5 Language for Social Interaction
- 6 Communication Skills
- 7 Analysis, Inquiry, and Design
- 8 Information Systems
- 9 Mathematics
- 10 Science

- 11 Technology
- 12 Interconnectedness: Common Themes
- 13 Interdisciplinary Problem Solving
- 14 History of the U.S. and New York
- 15 World History
- 16 Geography
- 17 Economics

ADDITIONAL RESOURCES

Rath, Sara. *The Complete Cow.* 1998. ISBN # 0-89658-000-8 http://www.aipl.arsusda.gov/kc/dairy.html http://www.entomology.cornell.edu/Extension/Vet http://www.ext.vt.edu/resources/4h/virtualfarm/dairy/dairy-producer.html http://www.entomology.cornell.edu/Extension/Vet/AID/Arthropod_ IDwherecow.html Animal Care On Dairy Farms Fact Sheet (included at end of unit)

SUPPLIES AND EQUIPMENT

Crayons or colored pencils

BACKGROUND FOR TEACHERS

Expanding on "Miss Moo and You"

This lesson elaborates on the lessons "Miss Moo and You" and "Many types of Farms" by further discussing the prominence of dairy production in New York's economy and how dairy farmers care for their animals. Students have learned about how we get milk and other dairy products from cows; now they will discover the variety of issues that can affect that production. From something as small as a fly, to the diseases that can affect milk quality, dairy farming is an industry that requires careful considerations of the overall health of cattle. Students will also learn about dairy farming as a career by looking at the life of a dairy farmer and what skills he or she needs to succeed.

A Variety of Dairy Products

Dairy products have their own category in the food pyramid and make up a big portion of New York State's agricultural exports. Besides milk, cheese, yogurt, and ice cream, dairy products can be found in many prepared foods, some of which may be surprising. Yogurt is considered to be a healthful and beneficial dairy product. The nutrients found in milk are also found in yogurt, but yogurt has undergone fermentation which produces additional benefits in the form of healthy bacteria.

Historical Perspective

Before the arrival of European settlers, the only cattle found in America were the buffalo. Imported European cattle were used for multiple purposes: milk, meat, and labor. The demand for milk increased rapidly as the population in America grew, so breeds of cows that were used especially for milk were shipped across the ocean to find their home on dairy farms across the country.

Pioneer Dairy Farming

Dairy farming during the eighteenth and nineteenth centuries was very different from dairy farming today. The way the cows were milked, fed, and housed depended on the technology available to farmers during that time. The milk processing industry was also vastly different. Milk was not **pasteurized** and couldn't be refrigerated, so fresh milk had to be obtained every day. Families who did not have their own cow bought their milk from a **milkman**. With the invention of the refrigerator the American **milkman**'s trade slowly died out, though there are still countries where milk is delivered right to the door.

Dairy Cow Diet and Care

Dairy cows are typically fed differently from beef cattle. Their diet is made to support the cows' milk production as well as to promote their health. Many farms rely on grassy pastures to feed their cows in the summer. During the long winter months, the cows are kept inside and feed has to be provided for them. Other farms feed their cows a mixture of food, called a TMR (Total Mixed Ration), all year 'round. TMR's are like a cocktail of all the foods a dairy cow needs to be healthy. It consists mainly of grass, corn, grain, and some minerals. Feeding the cows takes up a large portion of a dairy farmer's time. The cows have to be fed at least twice a day. They are also milked twice or even three times a day, making for a busy schedule. Then, there are the other jobs, like feeding and caring for the baby calves, and keeping the barn clean. Maintaining a clean and **sanitary** barn is especially important for cows' health, as messy barns attract pests and can harbor diseases.

A Healthy Herd Equals a Prosperous Farm

Poor waste management and out-of-control pest populations lead to poor milk production, diseases, **parasite** and worm infestations, and stressed animals. Dairy farmers have to do more than just feed and milk their herd; they have to take care of the whole farm to keep the herd prosperous and healthy.

The Challenges of Dairy Farming Today

The challenges of being a dairy farmer today differ from the challenges of the farmer in pioneer days. Feed is not usually an issue for dairy farmers today; harvesting techniques have improved, so there is always plenty of grain for animals to eat. Also, barn fires are not as likely because electricity is used instead of oil lanterns.

Farmers today have to deal with challenges involving the public. Farmers have to make sure that their animals are well taken care of and are clean so that the milk they sell stays clean and healthy, and the farmstead has to be well-maintained. Sometimes neighbors will complain if there is a strong odor coming from the farm, so farmers try to minimize the smell. As Cities and towns spread into rural areas, farms have to deal with closer neighbors than before.

Another challenge for the farmer is the long work hours. Farmers wake up early in the morning to milk and feed the cows. During the day they have to clean the barn, make sure the animals are healthy, give sick animals medicine, and repair any equipment that is broken. During the summer more work is needed to harvest the crops. They never get a day off, either, which is something most of us expect to have!

Another challenge is the cost of producing milk. There are many costs involved with dairy farming. Feed for the animals is the biggest one. A farmer may grow his or her own feed instead of buying it, but that can cost a substantial amount, too. Hiring labor is also expensive and is in short supply. Finally, equipment such as tractors can be a very expensive purchase..

In order to face every challenge, farmers need to have a variety of skills. To be successful, a dairy farmer needs to have extensive knowledge about agriculture, an ability to work with aniumals, mechanical and scientific

know-how, the foresight to plan ahead, communication and business skills, and the virtue of patience.

QUESTIONS FOR STUDENTS

Why is dairy production important to New York State? What does a dairy farmer do all day? Which crops might dairy farmers grow, and why? What pests bother cattle? How can Integrated Pest Management be used on dairy farms?

INTEREST APPROACH ACTIVITIES

SOMEONE FORGOT TO LABEL THE YOGURT!

TEACHER INFORMATION:

There are many nutrients in milk that are essential for healthy bodies. Most of those nutrients help to build stronger and healthier bones, and may also play a role in tissue and nerve function. This lesson allows students to examine the containers of dairy products and learn about the nutritional benefits of foods made from milk. Students will identify some of the main nutrients found in milk and milk products, and recognize the benefit each one provides. They will complete a worksheet to create their own label for a yogurt container. Display the students yogurt containers on a bulletin board.

Materials: Worksheet provided Drawing Supplies Empty yogurt containers Scissors

Prodecure:

- 1. Ask students to bring empty yogurt containers from home.
- 2. Ask volunteers to read the labels from their containers. Point out that milk is the primary ingredient.
- 3. Note that yogurt containers may have different statements about what health or taste benefits it offers.
- 4. Ask students to brainstorm what their yogurt offers them nutritionally. Milk is mostly made up of water, but it has a lot of nutrients, too.
- 5. Ask for volunteers to read the list of nutrients that milk and dairy products contain (found on student worksheet).
- Students can develop an eye-catching label for their own brand of yogurt. Each student should choose three nutrients/ health benefits to focus on in his or her design.
- 7. Tape the new labels on the empty yogurt containers for display.



Someone forgot to label the yogurt!

Read through the list below to find out what beneficial nutrients milk has in it. Then complete the activity below.

Protein:	Builds and repairs body tissues and bones, important in immunity.
Potassium:	Needed for nerves and muscles.
Vitamin A:	Important for your eyes, skin, bones, and teeth.
Vitamin D:	Helps your body to use calcium.
Calcium:	Builds strong and healthy bones and teeth.
Magnesium:	Helps to convert food into energy.
Phosphorus:	Helps with general functioning of your body.
Riboflavin:	A nutrient that helps to give you healthy skin, eyes, and nerves.

Instructions:

Your job is to market your yogurt to consumers - you want them to know it is healthy and tasty. Make a label for this yogurt container that states what health benefits it has. First, give your yogurt a catchy name. Then, pick a few nutrients from the list above. On the yogurt clabel, write a statement for each nutrient that includes the health benefit it provides. For example: *Contains Riboflavin, which helps to give you healthy skin!* Finally, cut out the label from this page (cut on dotted lines) and tape it around the yogurt container you brought from home. (Those unable to bring a yogurt container could use an eight-ounce paper cup.)

YOGURT

DAIRY DAYS

TEACHER BACKGROUND:

This lesson is designed to let the students use their imaginations and creativity to examine the challenges and benefits a dairy farmer might have.

Students will write a short narrative from the perspective of a dairy farmer. Students will learn that being a farmer is not simple, and like any job, there are challenges that need to be dealt with. Farmers must have certain skills to overcome their obstacles.

Materials:

Pencil and paper

Procedure:

- 1. Read "The Challenges of Dairy Farming Today" in a group or individually.
- 2. Brainstorm some challenges and benefits a farmer might encounter.
 - A. Challenges: Sick cows, pests, low milk prices, hard to find labor, weather and crops, keeping the barn clean, long working hours, etc.
 - B. Benefits: Being your own boss, getting to work with animals, being outdoors, free milk, etc.
- 3. Students will write a short narrative in the form of a farmer's diary entry. They should include the challenges the farmer might encounter in a typical day, as well as some benefits. Students can complete the assignment in class or as homework.
- 4. Ask for volunteers to read some of their narratives to the class.
- 5. Brainstorm ways in which dairy farming in the pioneer days differ from the challenges today's farmer faces. Have the skills a farmer needs changed as well?



SUMMARY OF CONTENT

I. Introduction

- A. Describes a dairy farm
- B. Introduces the term **domesticated.**
- C. The questions may be used to stimulate discussion.
- II. New York Dairy Facts and Crops
 - A. Discusses dairy production and dairy farm crops.
 - B. The term **beverage** is introduced.

III. A Day in the Life, etc.

- A. Describes the day-to-day activities on a dairy farm
- B. Asks related questions
- VI. Oh, My! Flies! (2 Pages)
 - A. Discusses pests associated with dairy farms, focusing on flies and their life cycle.
 - B. Describes four types of flies
 - C. Introduces the terms **bodily fluids**, **larva**, and **parasite**.

VII.IPM for Dairy Farms (2 Pages)

- A. Illustrates the six steps of Integrated Pest Management as they apply to a dairy farm, using the fly as an example.
- B. Introduces the term threshold

VIII.Goodbye, Fly!

- A. Explains some of the methods farmers can use to control flies.
- B. Terms include biological control, predator, parasite, and pupae

IX. Sanitation is Important

- A. Explains that proper **sanitation** can help to control pests
- B. Introduces the terms **decay** and **silage**
- X. Dairy Farm Math
 - A. Word problems for students to solve using multiplication.

TEACHING-LEARNING ACTIVITIES

I. Introduction

- A. This page may be read individually or aloud with group discussion.
- II. New York Dairy Facts and Crops
 - A. Students may read this page individually or it may be read aloud and discussed as a class.
- III. A Day in the Life, etc.
 - A. This reading may be done individually or used to stimulate discussion that includes the questions.

VI. Oh, My! Flies! (2 Pages)

A. These pages may be read individually or aloud with group discussion.

VII.IPM for Dairy Farms *(2 Pages)* A. Students may take turns reading aloud.

VIII.Goodbye, Fly!

- A. Students may read independently or aloud.
- IX. Sanitation is Important
 - A. Use the activity to remind students of places where flies are likely to become a problem if sanitation is not maintained.
- X. Dairy Farm Math
 - A. Students may work on these problems individually or as a class. You may want to work on each step together.

SUMMARY OF CONTENT

XI. Review

- A. This page reviews points from each page of the lesson, with a focus toward pest control.
- XII. Test Your Knowledge
 - A. This includes six short answer, multiple choice, and true-false questions related to the lesson.
- XIII. Vocabulary
 - A. Provided for student reference
- **XIV.Lesson Supplements**
 - A. Baited Fly Trap Experiment
 - B. Build a Fruit Fly Trap
 - C. Animal Care on Dairy Farms Fact Sheet

TEACHING-LEARNING ACTIVITIES

XI. Review

- A. This page may be used for individual review or a summary discussion.
- XII. Test Your Knowledge
 - A. Students should complete this individually. It may be used for a grade.
- XIII. Vocabulary
- XIV.Lesson Supplements
 - A. These additional enrichment activites may be done if time and resources allow.

Student Lesson: Dairy Farms Introduction

Dairy farms are a big part of New York State agriculture. These farms raise milk-producing female cattle, known as cows, specifically for their milk.

The milk is processed and can also be made into products like cheese, butter, ice cream, and yogurt.

The first **domesticated** cattle in North America were brought over by the early settlers from different parts of Europe. They were used for their milk, meat, hides, and as labor animals to pull plows and carts.

All of this cheese was made from milk that came from a dairy farm!

Some questions to think about:

- Why are dairy farms important to New York State?
- Which crops might dairy farmers grow, and why?
- What does a dairy farmer do all day?
- What pests can bother cattle?

How can Integrated Pest Management be used on dairy farms?









Student Lesson: Dairy Farms New York Dairy Facts and Crops

New York Is a Dairy State

In 2005, New York State came in third place for dairy production in the United States. Over \$119,000,000 worth of dairy products were sold from New York State that year.

Wyoming county, in western New York, is the leading county in dairy production.

Milk was adopted as the official state **beverage** (drink) in 1981.

Chocolate milk is made by adding sugar and cocoa powder to processed white milk.



Dairy Farm Crops

Dairy farmers often grow crops in addition to raising dairy cows. They can often save money if they grow their own grains for the cows to eat. Growing a crop can also give the farmers another product to sell and earn more money.

Wheat, hay, corn, red clover, alfalfa, and oats are a few examples of crops dairy farmers grow to feed their cows. Sometimes the cows graze on wildflowers and grasses that grow naturally in the farm pastures.

Why should dairy farmers pay attention to what they feed the cows they milk? The quality, taste, and color of the milk is affected by what the cow eats.

Many farmers add extra vitamins and minerals to the cows' feed. This helps keep the cows healthy, strong, and producing larger amounts of good quality milk.





Clockwise from top left: corn, wheat, hay, wildflowers, and red clover

Student Lesson: Dairy Farms A Day in the Life of a Dairy Farmer and a Dairy Cow

How early do you get up in the morning? Do you get up the same time during the summer as you do in the winter? What about on the weekend?

Dairy farmers get out to the barn as early as 4:00 A.M. to start their work. Being a milk producer means the barn, the milking machines and equipment and the cows have to be clean. Why?

The milking machines and the cow's udders must be **sanitized** (made germ-free) twice a day.



When milk comes from the cow it is not cold. It is around 95 degrees. Why? Milk must be cooled quickly. Milk can spoil if it is not kept refrigerated at less than 40 degrees.

The farmer can't eat his breakfast until after the cows have been milked and fed. What might a dairy farmer have for breakfast?

One dairy farmer might have many cows. Each cow eats about 75 pounds of food each day in the form of corn **silage**, alfalfa hay, and other grains. Most cows are given vitamins and minerals, too!

Based on this fact, what is something that might keep a farmer busy much of the time?



If you said, "growing grains" or "providing food" you would be right. The more feed a farmer grows for his cows, the less he has to buy.

Cows are usually fed after they are milked, and may also graze throughout the day. A cow eats for about six hours a day, and chews its cud for about 8 more hours a day. What is special about the way a cow eats?

Do you remember that a cow is a **ruminant**? Its food goes into the first chamber of its stomach and then is brought back up to chew on later.

Student Lesson: Dairy Farms A Day in the Life of a Dairy Farmer and a Dairy Cow

The dairy farm family and hired help stay busy in many ways. Milking equipment must be maintained and kept very clean. Equipment such as tractors and harvesters must be taken care of. The barn and barnyard must be kept clean. Fences must be kept in good shape.

Another job of the dairy farmer is removing manure. If a dairy cow eats 75 pounds of food in one day, do you think there might be a lot of manure?

Dairy cows spend much of their time outdoors. What is one reason farmers might want the cattle outside, rather than in the barn?

What might cause the farmer to keep the cows in the barn?

What might happen if manure is not removed from the barn?



Visitors to the dairy farm may include a veterinarian (vet) and a health expert.

Vets visit to check on the health of cows. What is one time of the year that vets may come more often than usual?

Visitors from the health department visit to insure that the farm's milking system and milk is meeting the high standards for healthy milk.

Farmers check the milk each time the cows are milked to make sure it does not have dangerous bacteria or other organisms in it. The milk is kept in giant refrigerated containers until it can be taken to a processing plant. If anything is wrong with it, the whole batch must be destroyed!

A dairy farmer is busy all day! When afternoon comes, the whole process of milking and feeding starts over again. Sometimes a farmer can have dinner and relax in the evening. Do you think the farmer goes to bed early?

Sometimes there is more work to do after dinner. This is especially true when there is food to harvest or young calves to look after.

The dairy cows stay busy all day doing what they do best!

Student Lesson: Dairy Farms Oh My! Flies!

Farm animals can be uncomfortable and even harmed by flies and other pests. Dairy farmers pay a lot of attention to what pests may be bothering their cattle.

Stress from pests can cause dairy cows to produce less milk. Dairy farmers know that happy cows make more milk. That's why they use IPM (Integrated Pest Management) to keep pests away.

A lot of the pests that bother cows are flies. Below is a diagram of the life cycle of a fly. Young, developing flies go though a worm-like stage, when they are called **larvae**. The **larva** of a fly is also called a maggot. Most people do not like flies because they can transfer germs and disease, and they like to land on our bodies and our food. Some flies can also bite! Cows probably do not enjoy having flies land on them any more than we do!



After the egg, what is the next stage in the fly's life cycle?

Flies have a life cycle called "complete metamorphosis." You may have heard of metamorphosis, and we will learn about it in future lessons.

Student Lesson: Dairy Farms Oh My! Flies!

House Fly



Stable Fly



Horn Fly



Face Fly



House Flies (Musca domestica)

They fly around, landing on you while you're reading a book or eating your dinner. The house fly is not just a pest to you, but to cows too!

They don't *hurt* cows, but they do make them uncomfortable. Cows do not have arms and hands to shoo them away. They can only swish their tails, flick their ears, and stomp their feet. This may get the house flies to leave, but they won't stay away for long.

Stable Flies (*Stomoxys calcitrans*) and **Horn Flies** (*Haematobia irritans*)

These flies hurt the cows by biting. Stable flies feed on the cows' blood several times a day, taking about 1 to 2 drops per meal. Horn flies have twenty or more of these meals a day.

Their bites are painful and their presence is annoying to dairy cows. Stable flies like to bite cows on their bellies and legs. You can tell if the cows have a stable fly problem if you see them stomping their feet a lot. Horn flies like to bite on the cows' backs, shoulders, and sides.

Face Flies (Musca autumnalis)

Face flies are a pasture fly and don't bite. But, they do eat **bodily fluids** around the cows' eyes, muzzle (nose), and mouth. This makes the cow uncomfortable. Female face flies will feed on blood if there is an open wound or bites from other pests like the stable and horn flies.

Face flies can easily pass around eye diseases and **parasites** like pinkeye and eye worms. Other than shaking their heads, cows have no way of brushing off or shooing away these flies.

If pest problems are allowed to grow and get out of hand, this could spell trouble for the farm's business. Unhappy and uncomfortable cows have a harder time producing good milk when they are using up their energy to shake off pests.

Most fly problems in and around barns are causeb by stable flies and house flies. Horn flies, facer flies, and stable flies bother cows in the pasture.

On what parts of the cow are stable flies usually found?

On what parts of the cow are horn flies usually found?

Student Lesson: Dairy Farms IPM for Dairy Farms



Farmers must first be able to identify the type of pest that is bothering their animals. You have seen pictures of flies that bother cows. The farmer will learn about the pest so he can make the best choices in dealing with them. Knowledge is important.



IPM for Dairy Farms: Step 2 - Learn the life cycle of the pest "Will there soon be a lot more?"

Farmers know that flies like to lay eggs in organic matter such as rotting feed and manure piles. Removing these nesting areas is the best way to reduce pests. This prevents them from coming near the cows in the first place

By understanding the life cycle of pests, we learn to deal with them at the best time, and only when necessary.



IPM for Dairy Farms: Step 3 - Sample the area "How many are there now?"

Are there only a few flies or are there a lot?

IPM farmers sometimes use spot cards to keep track of the number of flies in the barn. Flies leave spots where they land, and from the number of spots left on the card a farmer can figure out about how many flies are in the barn.

IPM farmers can also count flies found on sticky traps or on the cows themselves.

Student Lesson: Dairy Farms IPM for Dairy Farms



IPM for Dairy Farms: Step 4 - Determine an action threshold "Do I need to treat or not?"

If there are only a few flies, a farmer might not have to worry. For example, if there is an average of 10 stable flies on the legs of fifteen of the cows, it is time to act, IPM farmers learn the **threshold** for each insect pest.



IPM for Dairy Farms: Step 5 - Choose the best tactic "What is the best and safest way to reduce the pest?"

The best way to reduce flies is to reduce the places where they breed. IPM farmers try not to use pesticides whenever it's possible. For example, sticky tapes that trap house flies are safer than spraying chemicals.



The IPM farmer will continue to check his cows and barn for flies. He will be able to tell what works best to reduce fly problems. Student Lesson: Dairy Farms Goodbye Fly!

Some ways farmers deal with flies.

A non-toxic method of reducing house flies is to use sticky tapes or ribbons, sometimes called fly strips. Farmers can use them to catch flies and to count them, too.

Farmers set out a minimum of 5 spot cards or fly strips at different locations around the barns. After 7 days, they count the number of flies stuck on the sticky ribbons, or the number of spots on the spot cards. Ribbons with 250 flies or more per week **or** spot card counts of over 100 spots per card per week are considered high levels of fly activity (over **threshold**). To be effective, spot cards and fly strips must be replaced every 1-2 weeks.

Biological control means introducing diseases or natural enemies to the fly population, such as **predators** or **parasitic** wasps. **Predators** like beetles and mites feed on fly eggs and **larvae**.

Parasitic wasps are very important **predators**. They are very tiny insects that eat fly **pupae**, reducing their numbers. Adults can be as small as 1/64 inch long! One of the most common parasitic wasps is the lchneumon pictured on the right. The Chalcid pictured below is so small that it can only be seen clearly through a special microscope!





Parasitic wasp females find fly **pupae** and lay an egg inside the pupal case. When the baby **parasitic** wasp hatches, it has a fly **larva** for its first meal. This means a lot fewer flies in the barn!

Pesticides and insecticides should be used as a **last resort**. These chemicals are meant to kill pests but sometimes they also kill helpful **predators** like **parasitic** wasps, beetles, and mites. Mis-use of these chemicals can lead to surviving pests becoming resistant to the chemicals.

Student Lesson: Dairy Farms Sanitation is Important

To prevent a fly problem, farmers should cut down on places where flies can breed and lay eggs. What should the farmer do (weekly) to prevent a fly problem?



Here are some places in the barn and barnyard where flies can lay eggs and multiply. Farmers try to reduce the places where flies breed by reducing the amount of organic matter. Flies breed in animal manure, **decaying silage** (old, stored feed), spilled feed, and old wet bedding.

The illustration shows some of these places:

- 1. calf hutches where calves are raised
- 2. spilled grain near silos or leaky silos
- 3. animal stalls and pens, animal feed storage areas, and water source areas
- 4. areas where calves are born or animals with illnesses are treated
- 5. water sources and tanks
- 6. feed troughs

Student Lesson: Dairy Farms Dairy Farm Math



 John is a dairy famer. His best cow is milked two times a day and produces enough milk to fill 50 glasses every time she is milked. How many glasses of milk will she produce in four and a half days?

Answer: _____

2. While John was at the state fair, his hired help did not keep the barn as **sanitary** as it should be. When he got home, he hung up sticky ribbons to trap house flies, and counted the number of horn flies, stable flies, and face flies on his cows. The numbers were high, and he ordered **parasitic** wasps to take care of the problem.

John released 200 wasps each week for each cow. He has 50 cows. How many wasps were released in three weeks?

Answer: _____

3. One week's worth of **parasitic** wasps costs \$13.00. It took three weeks to get the fly problem under control. How much did John pay?

Answer: _____

4. **Parasitic** wasps are a safe way to treat fly pests. This is called **biological control**. A container of pesticide to treat barn flies could cost \$50.00 or more. What are two reasons that **parasitic** wasps might be a better choice than pesticide?

A._____

B._____

Student Lesson: Dairy Farms Review

- New York State is in third place nationwide for dairy production.
- Wyoming county is New York State's best dairy producing county.
- Dairy farmers sometimes grow crops like wheat, red clover, alfalfa, corn, oats, and hay to feed their cows and sell any extra.
- Dairy farmers work long hours every day to take care of their cows
- The main fly pests on dairy farms are house flies and stable flies in the barn, and stable flies, horn flies and face flies in the pastures.
- Reducing the amount of organic matter like spilled feed, old bedding and manure in the barnyard is an IPM way of preventing flies from becoming a problem.
- Sticky ribbons and spot cards are two ways of counting the number of flies in a certain area.
- Many flies can be counted right on the cow's body
- Biological control is an IPM way of introducing a natural enemy or releasing more predators to decrease a large pest population.
- **Parasitic** wasps and **predators** such as beetles and mites can reduce barnyard fly pests.
- Cows that are bothered or harmed by pest problems become stressed and produce less milk.



Student Lesson: Dairy Farms Test Your Knowledge

- 1. List three possible natural enemies of flies:
 - Α._____
 - В. _____
 - C. _____
- 2. Which fly is usually found on:
 - A. Shoulders, back, and sides? _____
 - B. Eyes, muzzle, and mouth? _____
 - C. Legs and belly? _____
- 3. These crops might be grown to help feed the dairy cows and earn the farm more money if there's any extra to sell (check the best answer):
 - A. _____ corn, oats, beans, hay, celery, and squash
 - B. _____ hay, alfalfa, tomatoes, apples, potatoes, and red clover
 - C. _____ red clover, corn, oats, hay, corn, and wheat
- 4. The more flies in the barn, the more milk cow makes.

_____ true

_____ false

5. California is in first place and Wisconsin is in second place for dairy production in the United States. Which state is in third place?

Answer: _____

6. Dairy farmers don't need to work on the weekends because the cows don't produce milk those days.

_____ true

_____ false

Student Lesson: Dairy Farms Vocabulary

Agricultural technology- technology used to improve crop and animal care

Beverage - a drink

Biological control - controlling a pest by using its natural enemies

Bodily fluids - any liquid substance from a body (tears, saliva, mucus, sweat, etc.)

Decay - the breaking down of natural material (organic matter)

Domesticated - animal or plant that has been tamed and is no longer wild

Efficient - taking less time or effort to accomplish the same job

Free-stall barn - a type of barn where the cow is not tied to a particular stall.

Larva - a wormlike baby fly (maggot), in the second stage of fly growth (plural larvae)

Milkman - a person who sells milk door to door for a living

Milking parlor - an area where cows are milked

Parasite - an organism that lives off another organism without providing anything in return.

Pasteurize - to heat milk to high temperatures in order to kill bacteria

Predator - an animal that hunts and eats other animals

Pupa - the transforming stage between **larva** and adult; wrapped in a covering (plural **pupae**) **Ruminant** - A animal (including cattle, goat, or sheep) which has a four compartment stomach

Sanitary - clean and safe for the health of animals and people

Selective breeding - breeding animals for a certain trait, like milk production

Silage - animal feed that can be stored through the winter

Threshold - the limit or point where something becomes a problem

Tie-stall barn- a type of barn where each cow is tied in their own stall

Integrated Pest Management is a specialized form of environmental management wherein scientific research and real world application work together to reduce pests such as insects, diseases or weeds.

- 1. Properly identify pests
- 2. Learn the pest/ host biology
- 3. Sample the environment for pests
- 4. Determine an action threshold
- 5. Choose the best tactic
- 6. Evaluate results



Teacher Information for Student Worksheets

Interest Approach Activity	
Back in the Old Days	
Answers:	
A1. 40 minutes per day	B1. B
A2. 200 minutes per day	B2. B
A3. Farmer John	B3. B
A4. 160 minutes	B4. A

Student Worksheet 1

Introduction

Teacher or students may read this page aloud to encourage a class discussion.

Student Worksheet 2

New York Dairy Facts and Crops:

Dairy farms are big business in New York State. Much of its farmland is dedicated to growing crops to feed its many cattle.

For fun, ask your students how a black and white cow can eat green grass and make white milk!

Student Worksheet 3-A

A Day in the Life of a Dairy Farmer and Dairy Cow

Students and teachers alike look forward to the weekends and summer to relax. It seems the dairy farmer doesn't have that option. There is plenty of work to do on any farm and especially on a dairy farm, isn't there?

Answers:

- 1. "germs" in milk can make it unsafe to drink
- 2. 95 is the cow's body temperature
- 3. There are many options here but farmers need a hearty meal.
- 4. Growing crops to feed the cows
- 5. A cow has a special stomach with more than one chamber

Student Worksheet 3-B

The Day in the Life of a Dairy Farmer and Dairy Cow

Farmers prefer to keep cows out of the barn when possible to reduce the amount of manure removal. However, there will be times of the year that weather will keep them in the barn. Many farms use artificial insemination to produce the next group (or "crop") of calves, so vets will visit often at that time as well as during calving season nine months later. Mother cows must be healthy and well fed as delivery time approaches. Newborn calves are susceptible to cold and wet weather in the spring and the farmer must be prepared to offer warm, dry shelter to improve the calf's chances of survival.

Answers

- 1. reduces manure in barns
- 2. extreme weather
- 3.more chance of fly problems
- 4. Vets will visit more during calf season

Student Worksheet 4-A

Oh My! Flies!

No one likes flies, it seems. However, a few like the Hover Fly are plant and people-friendly and are considered beneficial insects.

This section teaches students about the fly life cycle and the fact that flies can be pests of cows. While we can shoo them away, or use a fly-swatter (the non-toxic method of getting rid of flies), cows can only stomp their feet or swish their tails.

Student Worksheet 4-B

Oh My! Flies!:

Students may read this on their own or take turns reading it aloud. House flies, stable flies, horn flies, and face flies are common pests of cattle on dairy farms. Other kinds of pests include deer flies, horse flies, different varieties of lice, and cattle grubs (a vicious **larva** of the heel fly). Answers:

1 Legs and bellies

2. Back, shoulders, and sides

Student Worksheet 5-A

IPM for Dairy Farms

Here is a recap of the 6 basic steps of IPM or Integrated Pest Management. These are the same 6 steps for any pest, whether it is a disease, insect or weed. Making good IPM decisions takes the incentive to learn about the pest, its life cycle, the best time to treat it and the best methods of treatment. It is basically a "think before you act" form of management which usually helps reduce the need to use pesticides.

Student Worksheet 5-B

IPM for Dairy Farms

IPM for barn and pasture flies is based on two major ideas: learn about pest flies, and reduce the amount of breeding places they have access to. No one can prevent flies completely (even if that was a good idea!), but just like in our homes, they can be reduced.

Flies in your home? Check your windows and screens and keep doors closed. Use fly swatters and fly strips where possible rather than sprays. Keep garbage covered and garbage cans closed. Dispose of animal wastes properly; keep areas clean.

Student Worksheet 6

Goodbye, Fly!

Biological control is one of the fastest growing methods of dealing with barn flies.

Parasitic wasps are naturally found outdoors, but because of their small size, they are not often seen. These tiny beneficial insects are commercially raised to be sold to and released by farmers and growers because they target the **larvae** of pest insects.

Student Worksheet 7

Sanitation is Important:

Manure management is a big job on dairy farms. While it can be a good dressing for fields, it is not spread on all fields at any time of year. Sometimes it is stored in a large pile or concrete-sided storage area and aged, then applied between crops or in the off season. In some cases it may be spread daily.

The activity reminds students of the places where flies are likely to become a problem when sanitation is not maintained.

Student Worksheet 8

Dairy Farm Math:

Students may work individually or as a class to solve these word problems. You may want to work through each step together.

Answers:

- 1. $50 \times 2 = 100$ glasses of milk per day. $100 \times 4.5 = 450$ glasses in four and a half days.
- 2. $200 \times 50 = 1,000$ wasps per week. $1,000 \times 3 = 3,000$ wasps in three weeks.
- 3. $13.00 \times 3 = 39.00 for all three weeks' worth of wasps
- 4. A. Using parasitic wasps may cost less than using pesticide
 - B. Using biological control reduces the use of pesticide and may be as effective or more effective

Student Worksheet 9 Review

Student Worksheet 10

Test Your Knowledge:

Students should complete this page individually. It may be used as a quiz or test grade.

Answers:

- 1. Beetles, mites and **parasitic** wasps
- 2a.Horn fly
- 2b. Face fly
- 2c. Stable fly
- 3. C
- 4. False
- 5. Stable fly
- 6. False

<u>Student Worksheet 11</u> Vocabulary provided for student reference

LESSON SUPPLEMENTS

THE DAIRY FOOD INDUSTRY, PAST AND PRESENT

TEACHER INFORMATION:

The Dairy food Industry in America was very different when our country was young. In pioneer days, dairy foods were produced on a very small scale; most families owned their own milk cows and other livestock. As our country grew, the dairy industry evolved from small family farms to larger-scale dairy operations. As farms grew larger, the processing industry changed to accommodate larger demand for milk and the changing market. People wanted more dairy products than just milk, cream, and butter. They wanted many types of cheeses, yogurts, fat -free and reduced fat milk, cream cheese, and other products made from milk. This lesson compares how early America's dairy industry differs from today's.

MATERIALS: Worksheets

PROCEDURE:

- 1. Read the "Past Dairy Farms" worksheet as a class or individually. Allow students to complete the **milkman** brainstorming activity.
- 2. Read the "Present Dairy Farms" worksheet.
- 3. Create a T-chart of the differences between dairy farming in the past and dairy farming in the present.

ER KEY: Differences Between ent Dairy Farms			
Dairy Farms Present			
 Most people do not own cows Larger farms Cows just for milk More milk per cow Better technology Fed Total Mixed Rations Mostly free-stall barns Milking machines used Milked in milking parlor Milk is pasteurized Milk sold in stores Consumers can choose from a variety of products 			

4. Complete the "Back in the Old Days" worksheet.

Dairy Farms in the Past

The first dairy cows in America came with setters from Europe starting just a few hundred years ago. Before that, the only animals similar to the cows we know were the wild buffalo. Usually, each family of settlers had a cow to provide them with milk, butter, and cheese.

The type, or breed, of cow they brought with them served different purposes for the farm family. They were used not only for milk, but for meat and labor. Cattle and oxen pulled heavy plows and farm wagons; the cows worked for their feed by helping the farm family. Each cow provided only a few pounds of milk per day, but that is all one family needed.

The cows were not fed very fancy foods - they mostly lived on grass and hay. They were housed in stalls, in a type of barn called a **tie-stall barn**. Each cow was tied in its own stall, with straw on the floor to keep the cows comfortable. They were milked by hand, because milk machines were not invented yet. The farmer went into each cow's stall and milked her, then let her outside to the pasture when the weather was nice.

As the population grew in America, more families began to live in towns and cities. Because it is difficult to keep a cow in a town or city, many families did not own a cow. These families purchased milk from a **milkman**. The **milkmen** made a living bringing milk and butter right to people's doors to sell. As more people started buying milk instead of milking their own cows, the dairy industry was truly born.

There were many challenges for dairy farmers during pioneer days. It was difficult to keep the cows fed during the winter months. Hay had to be put aside for the cows to eat. This was a community event, and neighbors always pulled together to help each other. Another challenge was a barn fire. Barns store a lot of hay and feed, which can catch on fire easily. Farmers relied on oil lanterns to be able to see, and if a lantern was tipped over, the barn could catch fire. Neighbors would rush to the farm with water buckets to try to save the building and cows.

Brainstorming about Milkmen:

Milkmen had to deliver milk every day because refrigerators were not invented yet.

Why would the invention of the refrigerator change the way milk is bought by consumers?

What effect would this change have on the **milkman's** career?



Dairy Farms in the Present

Today, most people do not own cows. Instead, only a few people own (and milk) a lot of cows each. The average dairy farm in New York State in 2006 had 100 cows, while most settler families only had one!

As the population grew, more milk was needed to feed people. More and more cows were needed, and farmers wanted their cows to make more and more milk. Farmers began to **selectively breed** for cows that made the most milk. **Selectively breeding** means that farmers breed cows that have a specific trait, such as a larger milk production. Farmers also use **agricultural technology** to grow better crops, and to better take care of animals. The result? More milk! In the old days, 20 pounds per day was a lot for one cow to make. Today, one cow can make up to 100 pounds!

Cows are fed a very complex diet of corn, grass, and grain. The feeds are mixed up, and are called Total Mixed Rations (TMR's) because everything a cow needs is in the feed. Cows are housed in a variety of styles of barns. Some are still kept in **tie-stalls**, but most are kept in what is called a **free-stall barn** where many cows are kept in a pen together. In **free-stalls**, the cows are free to move around and can choose their own stalls to lie in.

At milking time, cows in **free-stalls** are moved to a separate area called a **milking parlor**. The cows enter at one side, are milked by a machine, and then are herded out the other side. This is more **efficient** than milking each cow in her own stall.

In pioneer days, the **milkman** delivered the milk fresh within a few hours of milking. Today, the milk must travel long distances to reach the consumer, so the milk has to be able to stay safe and fresh tasting. Milk can have bacteria in it that cause it to spoil quickly, and some of the bacteria can be harmful to people. For this reason, all milk is **pasteurized**, or heated to high temperatures to kill the bacteria. Milk must go to a processing plant to be **pasteurized** before it can go to the store.

People want to buy milk, but they also want a variety of dairy products that are tasty, offer health benefits, and are handy to eat. In this way, dairy consumers today are very different from the settlers from years ago.

Brainstorming about the Differences Between Pioneer Days and Today:

There are many differences between dairy farming the pioneer days and today.

Make a T-Chart that shows these differences.



Back in the Old Days

Before farmers had access to a lot of technology, they worked and did everything by hand. Farming was an all-day job. It still is today, but now farmers can take care of many more animals in the same amount of time. Technology allows farmers to be more **efficient**, which means that it takes less time or effort to accomplish the same task.

- A. Math Problem:
 - 1. John has a very small farm of 10 cows, and it takes him two minutes to milk each cow with a milking machine. He milks twice a day. How many minutes does it take him to milk all his cows every day?
 - 2. John's great-grandfather Paul had 10 cows, but he didn't have a milking machine. It took him 10 minutes to milk each cow, and he milked twice a day. How many minutes did it take him to milk all his cows every day?

Who is more efficient: Paul or John? ______

- 4. By how many minutes is he more efficient?
 - B. Picture Identification:
 - 1. Which dairy (A or B) looks the most like a modern dairy?
 - 2. Which dairy would make the most milk per cow?
 - 3. Which dairy would use milking machines to milk their cows?
 - 4. Which dairy lis a **tie-stall**? _____



Picture Courtesy of Eric Carlberg

Dairy B



Picture:www.agriculture.eku.edu/statelanddairy.htm

Dairy A

1. Baited Fly Trap Experiment

The following pages diagram how to make a homemade fruit fly trap. This trap can be modified to attract other flies and insects simply by changing the bait used.

Goal:

Determine if there is a fly overpopulation problem in your area.

Setup:

- 1. Construct at least two traps using fruit as bait in one trap and bits of tuna in the other. Place the traps around the school, at least 5 feet apart.
- 2. Let the buildings/grounds workers know that you need the traps to stay in place for the duration of the experiment. You may also wish to either a) attach a string to opposite sides of the trap in order to hang it up or b) secure the trap to a pole or on a flat surface with tape or string so the traps aren't easily knocked over or blown away. Remember not to cover the sides.
- 3. Take the students with you when to you place the traps around the school.

Instructions:

- 1. Divide the class up into groups, each being assigned one trap. The trap-making material should already be cut/drilled so the students may bait and assemble the traps themselves.
- 2. Each group will monitor its trap for a set duration. This duration could last from 1 to 2 weeks, depending on if there is a significant fly population in the area. If you have a large population, traps will catch more flies in a shorter period of time.
- 3. The students will record observations of their traps such as how many flies are present, if other insects are present, and what the condition of the bait is (wet, dry, smelly, rotting, etc).

Analysis:

- 1. On the chalkboard write each trap number with the kind of bait used. Have each group give their counts for each day of the experiment. You can decide whether or not to include other insects trapped in the counts. Ask students which bait they think worked best.
- 2. Ask students why traps may not have caught many flies: not a large population in the area; someone else was using pesticides near the trap; bait dried up and stopped giving off an odor; the weather was too hot/cold/rainy/windy to allow flies to get to the traps, etc.
- 3. Combine the total flies from all traps for each day. Have each student make a line graph tracking the daily total of trapped flies for the duration of the experiment. Were there certain days that the fly count stayed the same? What about days where the fly count went down what might the reason be?
- 4. Based on the final count of flies trapped, ask students if they think they have a small, moderate, or large population of flies in the area. Why might the population be small (pesticides, dry climate, lack of **decaying** material nearby) Why might it be large (too few **predators**, favorable climate, **decaying** material nearby)? If they determine a large population, ask students to suggest ways to control the population based on what they've learned.

Analysis Questions:

- 1. By the last day of the experiment, which bait attracted the most flies/insects?
- 2. Why might have some traps caught fewer or no flies/insects?
- 3. Total the number of flies/insects trapped each day. Make a line graph of the total number of flies/insects caught each day.
- 4. Based on your line graph, were there days that the fly count stayed the same? Were there days where the fly count went down?
- 5. Based on your results, is there a small, moderate, or large fly population in your area?
- 6. What are some possible reasons why your (or a) fly population is small/large?
- 7. What are some IPM ways to control a large fly population?





| INTRO | BASICS | TOOL BOX | BUILDING BLOCKS | LINKS | INVESTIGATIONS | BOTTLE COLUMNS | HANGING BOTTLES | HOME |

Build a Fruit Fly Trap

Materials



- One 2-liter bottle
- Bottle Biology Tool Kit (link to tool kit)
- Three to five film cans
- One plastic lid to fit inside base
- Small amount of banana or other fruit

Step 1 – <u>Remove label</u> from 2-liter bottle.



Step 4 – Tape top securely so no flies escape. Place 2-3 slices of banana into 1 film can to start, and set in bottle base. Set the film can on a plastic lid, like that from a cottage cheese or deli container, so it doesn't tip. Once you have caught a few flies, add more film cans loaded with fruit.



Animal Care on Dairy Farms Fact Sheet

A cow's health is of the utmost importance to dairy farmers, because proper animal care leads to the production of high quality milk. Nutritious diets, healthy living conditions and good medical care are all essential for a healthy herd, and these are among the many animal welfare practices routinely used by dairy farmers.

Animal scientists and dairy farmers continually explore different ways to improve the comfort of dairy cows. Typical practices on modern farms include:

Food & Shelter

- Dairy cows always have access to feed and fresh, clean water. Additionally, many of today's modern dairy farms use "free stall housing," which is a type of barn that allows cows to eat and sleep whenever and wherever they choose.
- Farmers ensure that their cows have room to lie down, stretch, eat and drink comfortably.
- Many dairy farmers have installed rubber or other non-slip flooring in their barns to make it easier for the cows to move around. Cows may sleep on waterbeds, sand beds or mattresses made of rubber, foam or a combination of the two.
- Most dairy barns use advanced ventilation systems to assure healthy air quality. On warm days, farmers use fans and misters to make cows feel cool and comfortable.
- Farmers employ professional nutritionists to develop a scientifically formulated, balanced and nutritious diet for their cows. Diets include hay, grains, protein sources (such as soy) and other vitamins and minerals.

Health & Medical Attention

- Dairy cows interact every day with farm employees during their regularly scheduled milkings.
- Cows receive regular veterinary care, including periodic check-ups, preventative vaccinations and prompt treatment of illness.
- It's important to note that dairy cows are not routinely treated with antibiotics. When antibiotics are used to treat a clinically diagnosed illness, the cow is taken from the milking herd and treated. She is not put back into the milking herd until her milk tests free of antibiotics.
- Every tanker load of milk is strictly tested for antibiotics. In the extremely rare event that any milk tests positive, it is disposed of immediately, never reaching the public. Farmers are financially liable if antibiotics are found in the milk, so they take these regulations very seriously.

Calves

- Dairy farmers provide a clean, dry, well-lit, and well-ventilated separate calving area to ensure comfortable, safe and hygienic conditions for both mother and calf.
- Both the cow and calf are monitored closely during the birthing process and afterward. Some farmers have video cameras in the calving area so that they can closely monitor their cows during and after the birthing process.
- After each birth, the farmer has the cow go through an appropriate resting period to ensure her health and comfort.

March 2006

Animal Handling

- On a daily basis, cows move on their own from their pens and fields as well as to and from the milking parlor.
- While most dairy cows spend their lives on a single farm, they may be transported when they are bought and sold. They are handled carefully in a manner that minimizes stress.

Milk Quality

- Dairy farmers work hard to protect the quality and safety of the milk supply. For example, milking equipment is sanitized daily.
- Milk is transferred directly from the cow to a refrigerated tank, which is transported daily for processing. Most milk only travels about 100 miles to get from the dairy to your local grocery store.
- Some farmers use a hormone supplement, known as rbST or BGH, to increase the milk production of selected cows. Extensive studies and review over more than 20 years has concluded that the use of rbST does not affect the quality of the milk. For details, visit www.cfsan.fda.gov/~ear/CORBST.html.
- Milk and dairy products are among the most tested and regulated foods in this country.

Dairy Farm Expansion

- Many dairy farmers, like other business owners, are modernizing and improving their efficiency in order to continue to support their families and meet consumer demand for dairy products.
- Of the 65,000 dairy farms in America today, most are smaller farms with less than 200 cows. The vast majority of U.S. farms – big and small – are family owned and operated.
- All dairy farmers, regardless of the farm's size, depend on healthy cows for their livelihood.

For more information or technical reference materials, contact National Milk Producers Federation (<u>www.nmpf.org</u>) or Dairy Management, Inc. (<u>www.dairyfarmingtoday.org</u>).