



Lessons presented by
Oklahoma State University
 Ferguson Family Dairy Visitor Center
 With Southwest-Southland Dairy Farmers

Instructor	Jaycie Heath
Grade Level	3-5
Lesson Title	Life Cycle of Dairy Cattle (In Person)

TEACHER PREPARATION

Learning Goals & Standards/Performance Indicators	
Learning Goals	Standards
1. Upon completion of this lesson students will be able to understand and explain the life cycle of dairy cattle. A. Critical Vocabulary: <ol style="list-style-type: none"> 1. Calf 2. Cow 3. Newborn 4. Heifer 5. Yearling 6. Mature 7. Holstein 8. Jersey 9. Weaning 10. Peak Lactation 11. Dry Cow 2. Upon completion of this lesson students will be able to understand how producers care for dairy cattle during their lifetime.	1. 3. LS1.1 Develop and use models to describe that organisms have unique and diverse life cycles, but all have a common pattern of birth, growth, reproduction, and death. 2. WG.5 The student will analyze agricultural and commercial land use.
Resources and Materials	
<input type="checkbox"/> VT Life Cycle <input type="checkbox"/> Southwest- southland dairy farmers <i>Milk. From Cows to Kids</i> <input type="checkbox"/> NC State Feeding Dairy Heifers <input type="checkbox"/> EPA Lifecycle Production Phases <input type="checkbox"/> US Jersey A Quality Heifer <input type="checkbox"/> PSU Dairy Heifer Growth <input type="checkbox"/> Visuals in the center <input type="checkbox"/> Student tour guides	
Announcement and Other Preliminaries	
1. Welcome students to the Ferguson Family Dairy, introduce self and what you do for the dairy, etc.	

LESSON DELIVERY

Anticipatory Set

- How do people grow? - Life stages of people, as a basis for comparison
 - Provide students with images of people at various life stages to equate to various life stages of

- cattle
 - Infant, child, teenager, adult, elderly
- As you show images to students, ask what the differences are between people at each age
 - Use questioning and sharing to discuss how different people at different life stages can perform different tasks.
- Explain that the same is true in the cows that give us milk; they are able to different things at different life stages.
- Today we are going to learn about cattle at different life stages and learn the vocabulary words used to describe those stages.

Direct Instruction

1st Learning Goal: Upon completion of this lesson students will be able to understand and explain the life cycle of dairy cattle. (From VT Life Cycle and NC State Feeding Diary Heifers)

Content Outline	Instructional Strategies
<p><u>Newborn calf</u></p> <ul style="list-style-type: none"> • “The average Holstein calf weighs from 90 to 100 pounds at birth... They are 4 to 8 weeks old when they are weaned from milk.” (VT) • “Jersey calves average 60 pounds at birth, with a range in birth weight from 42 to 72 pounds” (US Jersey) • All dairy calves are weaned from their mothers early on in life, normally about 12-24 hours after they are born. Weaning is when we learn to go without something that we like or have become attached to. Producers wean dairy calves to ensure they get the best care and nutrition possible and to make sure their mother is in good condition and healthy. Once the calves are weaned from their mothers they are taken to individual housing, called calf hutches- these are like bedrooms for the calves. Each calf hutch has a nice warm place for the calf to sleep and a door on the front for them to go outside when they want to. • Calves spend approximately the first six to eight weeks of their lives in calf hutches that allow farmers to protect them from getting sick or hurt like they could if they were with older cows. Calf hutches also serve as a way to make sure each calf is getting enough to eat every day. • The calves will get fed milk replacer (like formula for calves) with a bottle or bucket 1-3 	<ul style="list-style-type: none"> • Would love to have a visual showing the size differences of each age group, I think it's hard for people to get a grasp on how much cattle grow in their first year • Perhaps show prerecorded video (or live feed if we can get that?) of the calves at the dairy, would like them to see calves being bottle fed, what a calf hutch looks like, etc. • Mature Cow- show students to the viewing window and point out the two breeds in the free stall barn before discussing more about the mature cows •

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times a day, this means someone who works on the farm will see the calves multiple times a day. This helps ensure they are healthy and helps the calves learn to trust their producers.

- Prior to weaning, in this case the calves are weaned off of a bottle, they will get shots and have their horns removed. These things are done to not only protect the calf from illness and injury, the farmer also does this to help ensure the safety of those who come to the farm and the other animals the calf may come in contact with.
- Calves will be weaned between six and eight weeks old, this means they no longer receive bottles. Before weaning the farmer will make sure each animal is eating solid feed and has learned to drink water from a bucket or trough. Once weaned, calves will consume calf starter feeds that are designed specifically to meet their nutritional needs.

6 Mo Heifer

- A heifer is a young female bovine (cattle) that has not had a calf yet.
- “The six-month-old heifer is usually fed silage, hay, and grain. These heifers may also graze (eat grass) in a pasture. Holstein heifers weigh about 400 pounds at this age.” (VT)
- Jersey heifers at this age weigh between 259 and 321 lbs (PSU)
- These heifers live in groups of similar ages and/or weights and may spend most of their time in a barn or in a pasture. You might think of these groups like you think of your classes at school, you are all around the same age so you are in the same class.
- These heifers are older and, as such, do not need to be checked on as much as young calves, however each time they are fed the producer will look over them and make sure they aren't showing any signs of sickness.

Yearling

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- “This heifer is called a yearling because she is over one year old. The Holstein heifer weighs about 700 pounds and still has quite a bit of growing to do before she enters the milking herd in another year.” (VT)
- Yearling Jersey Females weigh between 471 and 548 (PSU)
- Yearling females, like the 6-month-old heifers, are housed in groups and can be inside or outside at this age. Again, they do not require as much supervision as young calves but are visually inspected when they are fed.
- Dairy heifers will be bred as yearlings to allow them to calve around two years old, this is the main difference between the 6-month-old heifer and the yearling. Like humans, cows are pregnant for about 9 months, or about 283 days.

2 yr old

- “This cow is two years old and recently had a calf for the first time. She is now producing milk and will keep on growing for the next few years before she is fully mature. [Holsteins] weigh about 1,200 pounds.” (VT)
- Jersey 2-year-olds generally weigh around 790-893 lbs (PSU)

Mature Cow

- “This adult [Holstein] cow weighs over 1,500 pounds. She is five years old and just had her fourth calf. She can eat over 100 pounds of feed a day and can produce over 12 gallons of milk a day during the early part of her lactation.” (VT)
- Lactation is what we say a cow is doing when she is producing milk
- “The average mature size for Jerseys is approximately 1,000 pounds.” (US Jersey)
- Mature cows are generally kept in large free stall barns in groups of mixed ages (2-5+ year old females). You can think about the free stall barn groups like an elementary school-

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students from kindergarten through fifth grade are all in the school at the same time. Mature cows are milked at least twice a day. Some of the cows at the Ferguson Family Dairy get the chance to be milked more than twice a day because the robotic milker allows them to decide when they want to be milked.

Learning Activity

- Students could be provided with a coloring sheet showing the growth stages of dairy cows with blanks to label the ages and name for each life stage.
 - Ex.) Under the image of a heifer they could write “6 months old” and “heifer” with help and prompting for spelling

Assessment

- Instructor could ask questions throughout or at the completion of the lesson like
 - “How old are the cows we get milk from?” (2, or more)
 - “What are the breeds of cows we learned about?” (Holstein and Jersey)
 - “What is a heifer?” (A cow that hasn’t had a calf/baby)
 - “What happens when a cow turns 2?” (She has a baby and she can be milked or the first time)
 - What’s one of the differences between a calf and a cow? (cows give milk, calves live in hutches, calves eat from bottles, etc.)

2nd Learning Goal: Upon completion of this lesson students will be able to understand how producers care for dairy cattle during their lifetime. (From *Milk. From Cows to Kids*)

Content Outline	Instructional Strategies
<p>Feeding</p> <ul style="list-style-type: none"> ○ Producers make sure their cattle are fed healthy diets throughout their lives, from high quality milk replacer for calves to, “a balanced diet of approximately 40 pounds of feed mixed into a ration consisting of such things as corn, wheat, oats, cotton seed, soybeans, and about 50 pounds of hay or silage,” for cows. These mature cows will also drink between 25 and 50 gallons of water per day. ○ Each female will spend between 6 and 7 hours a day eating, here at the Ferguson Family Dairy some of our cows even get snacks when they go into the robotic milker in addition to their regular diet. 	<ul style="list-style-type: none"> • Be sure to point out the cows eating from the bunk • Maybe include prerecorded videos of the cows eating/being fed • Point out fans, beds, how the cows can go into the robot, etc.

2nd Learning Goal: Upon completion of this lesson students will be able to understand how producers care for dairy cattle during their lifetime. (From *Milk. From Cows to Kids*)

- All the nutrients each milking cow consumes not only support her body, but they also contribute to her milk production, and helping her calf grow when she is pregnant. Making it very important that each cow gets exactly what she needs every day, producers can make sure cows are getting enough feed using special tags that identify each cow and can let her into the feed bunk when she needs to eat more or can shut her out when she's met her nutrition requirement.

Cow comfort

- During the prime stages of her life a dairy cow will most likely live in a free stall barn, like the one we have here. They are able to get up and move around as they wish, they have temperature control systems (like fans and wind blocks) to keep them comfortable, and some even have waterbeds to help them relax. Free stall barns allow the cattle to get up, socialize, or eat when they choose, with the added help of the robotic milker our cows are even able to choose when they get milked. For producers everything comes back to taking the best care of the cattle that they possibly can.

Formative Assessment

- Instructor should ask questions like:
 - “What are some ways farmers help cows stay comfortable?” (Fans, beds, etc.)
 - “What are some ways farmers make sure cows are getting the feed they need?” (Ear tags, special feeders, etc.)
 - How long do cows spend eating a day? (6-7 hours)

Closure

Closing Announcements/Reminders

- Answer any questions they may have
- Show them the robot and viewing windows one more time
- Thank students for coming to the Ferguson Family Dairy

