



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

Instructor	Jaycie Heath
Grade Level	6-8
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. <u>SS: 6.4</u> The student will analyze the interactions of humans and their environment in the Western Hemisphere. <ul style="list-style-type: none"> • 6.4.1 Describe the commercial agriculture and industrial regions that support human development • 6.4.2 Evaluate the effects of human modification on the natural environment through transformation caused by subsistence and commercial agriculture, industry, demand for energy, and urbanization. 2. <u>OKH.6.2</u> Analyze the impact of economic growth in various sectors including: <ul style="list-style-type: none"> • C. Continuing role of agriculture
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

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| <ul style="list-style-type: none"> • How do people grow? - Life stages of people, as a basis for comparison |
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- Provide students with images of people at various life stages to equate to various life stages of cattle
 - Infant, child, teenager, adult, elderly
- Ask them to come up with multiple differences between each age group and what they *can or can't* do and what makes them able to do those things at different ages.
 - Ex) Babies can't walk but children can because their legs are stronger, children can't drive but adults can because adults can get a license, etc.
- 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

<p>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)</p>	
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.” (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 birth, to ensure they get the best care and nutrition possible and to make sure their mother is in good condition and healthy. Before they are taken to individual housing, they are given colostrum, a nutrient and immunoglobulin rich milk that serves to help build the calf’s immune system. • 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 in calf hutches will get fed with a bottle or bucket 1-3 times a day, this means someone who works on the farm will be in contact with the calves multiple times a day. 	<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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This helps ensure they are healthy and helps encourage docility.

- Prior to weaning, calves will be vaccinated, dehorned, and most males will be castrated to be raised for beef. These things are done to not only protect the calf from illness and injury, by dehorning, vaccinating, and castrating the farmer also helps ensure the safety of those who come to the farm and the other animals that calf may come in contact with.
- Calves will be weaned between six and eight weeks old, this means they no longer receive milk replacer. 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 rations that are designed specifically to meet their nutritional needs.

6 Mo Heifer

- “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 are housed in groups with similar ages and/or weights and may spend most of their time in a barn or in a pasture.
- 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 visual inspection is performed to check for signs of illness.

Yearling

- “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)

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- 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 of age, this is the main difference between the 6-month-old heifer and the yearling. Because these females are being bred during this age, they will be watched and fed differently to ensure they are able to be bred. Like humans, cows have a gestation period of about 9 months, or about 283 days.

2 year old

- “Dairy farmers refer to animals like this one as a first-calf heifer.” (VT) While she is technically a cow because a cow is a female bovine that has had a calf, she still has growing to do, thus leading to the term “first-calf heifer”
- “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. She weighs about 1,200 pounds.” (VT)
- Jersey 2-year-olds generally weigh around 790-893 (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. A mature cow produces about 25 percent more milk than a first calf heifer.” (VT)

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- “The average mature size for Jerseys is approximately 1,000 pounds and the range in weight and height of mature Jersey cows is narrower compared to ranges described for larger dairy breeds.” (US Jersey)
- Mature cows are generally kept in large free stall barns in groups of mixed ages, they are milked at least twice a day.
- Mature cows will be milked for approximately 10 months before she is “dried off” prior to calving. The dry period, or when the cow is not being milked, should last for about 45-60 days.

Learning Activity

- Students could be provided with a bingo style sheet with blanks in informational sentences about dairy cows for them to fill in.
 - Ex.) A _____ is where newborn calves live for 6-8 weeks (calf hutch)

Assessment

- Instructor could ask questions throughout or at the completion of the lesson like
 - “What are the breeds of cows we learned about?” (Holstein and Jersey)
 - “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.)
 - How long are cows milked for at a time? (about 10 months)
 - When are calves weaned from their mother? (12 to 24 hours after birth)

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
Feeding <ul style="list-style-type: none"> • Producers ensure cattle are fed appropriate diets throughout their lives, from high quality milk replacer multiple times a day 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 mature females. These mature cows will also drink between 25 and 50 	<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.

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gallons of water per day.

- Producers are able to ensure that cattle are reaching their nutrient requirement with the help of animal nutritionists. It is the nutritionist’s job to understand how much it will take to keep cattle of different ages, breeds, and phases of lactation full and producing.
- 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.
- 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 critical that producers ensure each cow gets exactly what she needs every day, which they can do using special tags or pedometers 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 for the day.

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

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*)

- 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