



STEMsational Ag: The Virtual Farm

MIDDLE TENNESSEE STATE UNIVERSITY



Module 6: All About the Cows UNIT 1: A DAY IN THE LIFE Grades 3 - 5



National Institute of Food and Agriculture
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STEMsational Ag—The Virtual Farm

Welcome to Module 6 Unit 1: A Day in the Life



Introduction to the Unit:

View the video screenshots and narration from the video, "The Journey of Milk" for an introduction to the unit on pages 3 - 21.





The Journey of Milk

Also available online at: www.youtube.com/watch?v=nx0KYWxrO1k



Lauren, you've been to a dairy farm. What did you learn about how the milk gets to our school?



I learned so much and it's quite interesting to see what happens on a dairy farm - how the farmers take care of their cows and the land to make sure the cows are healthy, happy, and safe.



Cool!



Journey of Milk



Let's start with the people who work together to raise and take care of our local dairy cows ...



dairy farm families who work together to take care of their cows.



How Cows Produce Milk



First, the dairy farmers pay close attention to their cows.



This is a free stall barn ...



because the cows are *free* to stand or lay wherever they want.



Cows are creatures of habit and usually return to their favorite bed or stall.



This farm provides shelter for the cows. It even has fans to keep them cool!



The cows are very comfortable.



They have beds made out of recycled materials, sand, and sometimes they even get water beds.



For cows to make wholesome and nutritious milk, they must be kept healthy, happy, and comfortable.



This is Josh, and he's a fifth-generation dairy farmer.



Josh, tell us about what you do around the farm.



[Josh]: Well, first thing, bright and early every morning, we go through and drop off fresh feed.



This gives us the opportunity to walk through and check each cow on the dairy.



We want to make sure they're eating, and ...



we want to make sure they're feeling good.



If we run into issues that we can't solve on-site with some of these girls, we call a veterinarian, ...



because at the end of the day, what we want is healthy, happy cows.



[Lauren}]: Because cows produce a lot of milk, they need to eat a lot of food!

Approximately 100 pounds every day!



Food is offered to the cows throughout the day.



A dairy nutritionist helps the dairy farmer mix the right ingredients to feed the cows.



The cows eat a mixture of chopped-up corn called silage, along with hay and soybean meal, plus vitamins and minerals.



[Josh]: Here's the feed we feed the dairy cows.



[Lauren]: Just like any living thing, cows produce waste.

See that over there?

That's called a cow pie - and it's not something that farmers eat for dessert!

It's what comes out of the other end of the cow - manure!





Believe it or not, farmers recycle their cows' manure and turn it into something valuable for the environment.



Manure is used as fertilizer to grow crops on the farm.



Added to the soil, the plants use the valuable nutrients found in the manure and produce feed for the cows.



When dairy farmers recycle, the land uses less water and keeps the soil healthy.



Another way dairies reuse the manure by-product is to turn it into compost, just like what your family might buy at a store to use in your garden.



Dairy farmers also recycle water to clean the stalls and water their crops.



Dairy cows love to be milked.



They love the routine and they are calm when being milked.



The milk comes out of the cow at approximately 100 degrees.



Keeping the Milk Clean & Safe



To keep the milk clean and safe, it's transported quickly through stainless steel pipes.



The milk stays in the pipes, moving from the cow to the bulk tank, until the truck picks it up.



Human hands never touch the milk once it leaves the cow.



[Josh]: This tank here is for storage of the milk ...

and one of these tanks will fill up the semi that you see driving down the road.





[Lauren]: From the farm, the milk travels in an insulated truck to a processing plant.



At the plant, milk is tested, homogenized and pasteurized.



The milk can also be made into other dairy foods like cheese or yogurt.



The milk is put into gallon jugs, half-gallon cartons, ...



or in eight-ounce cartons like those that we see at our school.



The packages of milk are then put on a new truck to be delivered to your local grocery store or school.



[Josh]: Dairy farming is our way of life.



It's our responsibility to take care of the land ...



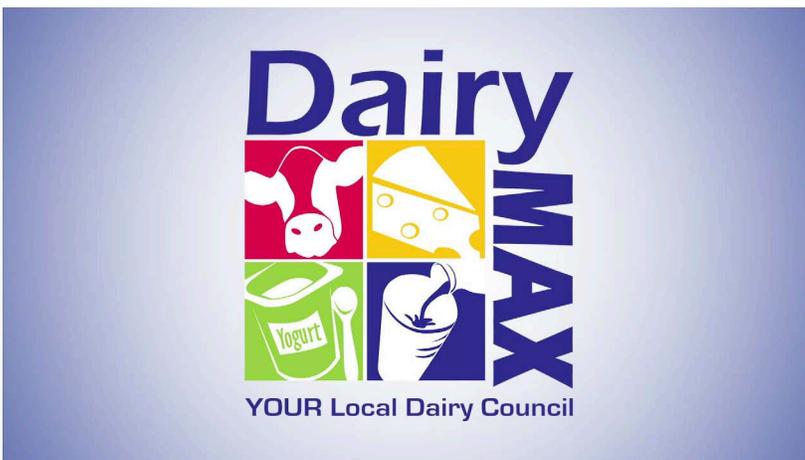
and the cows, and most importantly, the milk.



So that's what I learned about how the milk gets to our school.



Our dairy farmers really do care!





Pre-assessment:

Answer the following questions:

1. How often are cows milked?
2. What types of things do cows eat for nutrition?
3. What kind of products can we get from cow's milk?

Purpose:

- The purpose of this lesson is to provide examples of specific ways farmers/ranchers meet the needs of animals and promote understanding of the concept of stewardship and identify ways farmers/ranchers care for soil, water, plants, and animals.
- I CAN identify common vocabulary used with cattle and sustainability.
- I CAN identify key job responsibilities of a dairy farmer.

Student Learning Outcomes for the Unit:

- Student will explore the journey of milk.
- Student will utilize cattle and sustainability vocabulary.
- Student will demonstrate an understanding of basic job responsibilities of a dairy farmer.
- Students will create their own dairy food product.

National Agricultural Literacy Outcomes

Theme 2: Plants and Animals for Food, Fiber & Energy Outcomes

T2.3-5

D. Provide examples of specific ways farmers/ranchers meet the needs of animals.

E. Understand the concept of stewardship and identify ways farmers/ranchers care for soil, water, plants, and animals.

Vocabulary Words:

- **Cow:** female cattle
- **Bull:** male cattle
- **Calves:** baby cattle
- **Milk:** a product we get from dairy cows
- **Herd:** a group of cattle



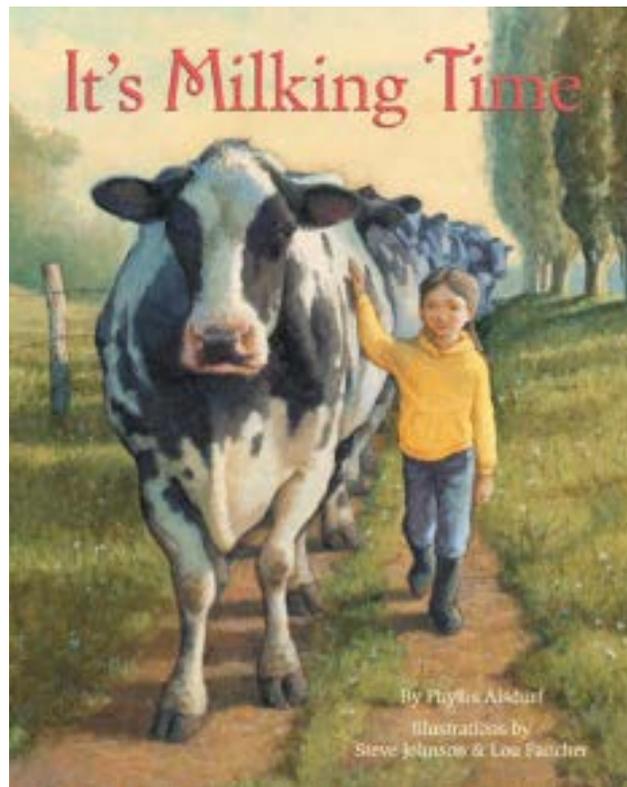
- **Cowman:** a caretaker of cattle
- **Free stall barn:** a barn used in the dairy industry where cows can lay or stand wherever they want
- **Sustainability:** avoidance of the depletion of natural resources in order to maintain an ecological balance

Materials Needed:

- Glassware with lid (mason jar)
- Heavy whipping cream
- Biscuit or cracker for tasting

Activity 1

Read the book, "It's Milking Time."



<https://youtu.be/mxDyfyBOMEw>



Activity 2: Take a Virtual Tour of Stauffer Farms!

Take a Virtual Tour of Stauffer Farms!

If you do not have access to the internet: View the video screenshots and follow the narration from the video "Virtual Farm Tour-4th-7th Grade at Stauffer Farms" on pages 25-79.

Virtual Farm Tour- 4th-7th Grade at Stauffer Farms

Virtual Farm Tour Stauffer Farms

Copy link

Connecting real students & families to real dairy farms, in real time.

DATE/TIME
MAY 10TH

WAYSTO JOIN
PRE-REGISTER FOR ZOOM
YOUTUBE LIVE
FACEBOOK LIVE

EXTRAS
LESSON PLANS
FACT SHEETS
PRE-VIDEOS

Watch on YouTube



Virtual Farm Tour: 4th-7th Grade at Stauffer Farms

Also available online at: https://youtu.be/P93_Kbq_EO4



Welcome, everybody! We are so excited to have you joining us today for a live Virtual Farm Tour of Stauffer Farms. We can't wait to show you all the cool things on the farm today.



I promise we're going to cover loads of great questions, and most likely answer your questions too.

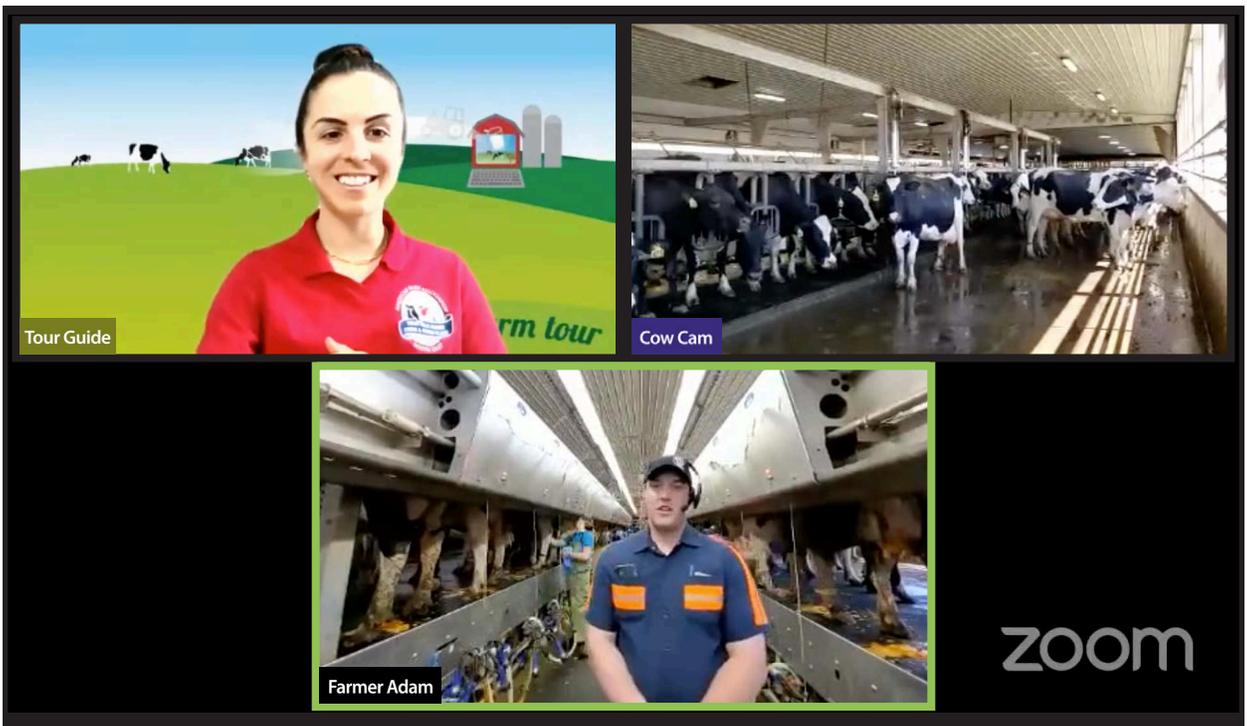


Tour Guide

[TOUR GUIDE]:

With that, we're going to head over to Stauffer Farms and check out Farmer Adam.

So, Farmer Adam, get us started on this tour today.



Tour Guide

Cow Cam

Farmer Adam



[FARMER ADAM]:

Hi, everybody. My name is Adam Bates, and we're here at Stauffer Farms today in northern New York.

Right now, we're standing in one of our milking parlors. We have two of them. We milk 3,800 cows, three times a day. We have cows being milked here 24 hours a day, seven days a week, every day of the year.



Farmer Adam

Behind me, we have just started our afternoon milking. So these guys, in this parlor here, will be milking about 1,700 cows during their shift today.



Cow Cam

So right now, I'm going to go through a little bit of our milking routine for you and show you how and why we do the things we do to get the cow ready to be milked.



Farmer Adam

So the first thing that we do, when the cows come into the parlor, is they all line up like this. This is called a "parallel parlor" because the cows are standing parallel, side by side, next to each other.



Farmer Adam

And when they stand like this, we're able to access the cow to work with her, from the back, between her two back legs.



So, the first thing that one of our milkers will do is - they go through and they strip a little bit of milk out of each of the cow's four teats.



They do this to check for any abnormalities. This can help us see if the cow's sick or if she's not feeling well. So it gives us a good idea of how the cow is doing.



After we do that, they will come through with a ... "teat dip" is what we call it. It's basically like a hand sanitizer. What we do with that is ... we put it on all four teats, and that allows us to wipe any dirt or manure that may be on the cow. This helps us to get clean, healthy, safe milk out of the cow for you to be turned into dairy products.



After we wipe the cows down, we will then go ahead and attach the milking unit. So that's what is happening right here.



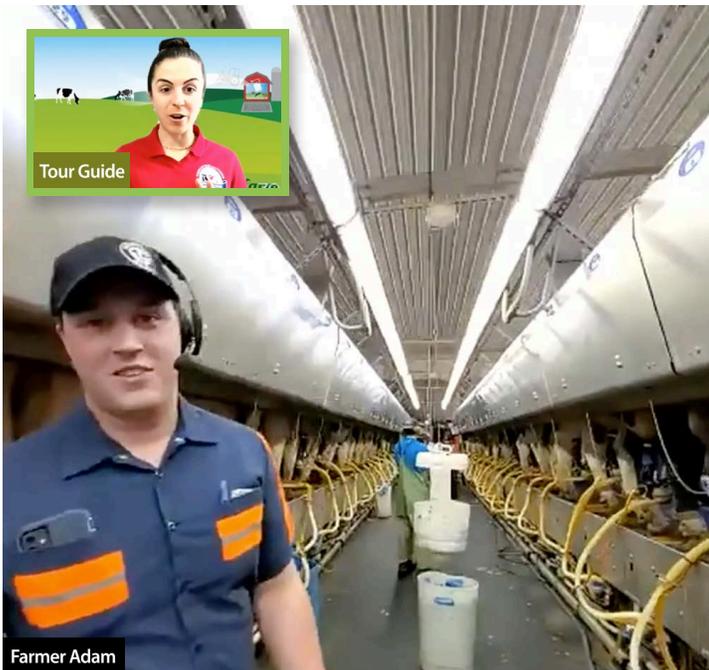
So, each teat on the cow has a cup that goes on it, and once it goes on, it doesn't take very long before the milk starts flowing out of the cow.



It does not take very long for the cows to be milked - maybe five minutes - but not much longer than that every time they're in here. So, while she does get milked three times a day, she really doesn't spend that much time actually working. She gets to spend a lot of time just being a cow every day.



This parlor is a "Double-24" so that means we're able to put 24 cows on each side of the parlor. So right now there are 48 cows in here currently being milked.



[TOUR GUIDE]:

Wow, that is super cool, Adam. That looks like it's running like a well-oiled machine. Those ladies know their job!

[FARMER ADAM]:

Yep, because they do this three times a day, they're very used to it. It does not take much coaxing to get them to come in here. They know what they have to do, and they're happy to leave once they're done.



And then, they get to go back to just being a cow - just hanging out - until they have to do it all again.



[TOUR GUIDE]:

Very cool. So, Adam, I'm seeing some leg bands on these cows. Can you tell me what those are? What are those little things on their legs?



[FARMER ADAM]:

Sure, so every cow is wearing a leg band right now, and I have one in my hands, too, that's clean here. Basically, this is a Fitbit for the cow, which you are probably familiar with. With this, we're able to identify the cow when she comes into the milking parlor. It helps us to know a little bit of current history about her.

So like a Fitbit, it tells us how many steps she's taking and what her activity level is like. That's a good reference for us to know how the cow is doing health-wise. It also allows us to record how much milk she gives, and then it sends this information to a computer that we can then go and access to analyze data.



[TOUR GUIDE]:

Wow, so it's pretty high-tech in the parlor!

[FARMER ADAM]:

Yes, there's a lot of automation, and there's a lot of sensors and things in here that ensure that this is a good experience for the cows and the workers.



Farmer Adam

One thing to go along with the automation is that right behind - right in front of me, actually - a machine just came off. Each milking machine has sensors in it. It knows when the cow is done being milked so we don't have to worry about taking the machine off.



Cow Cam



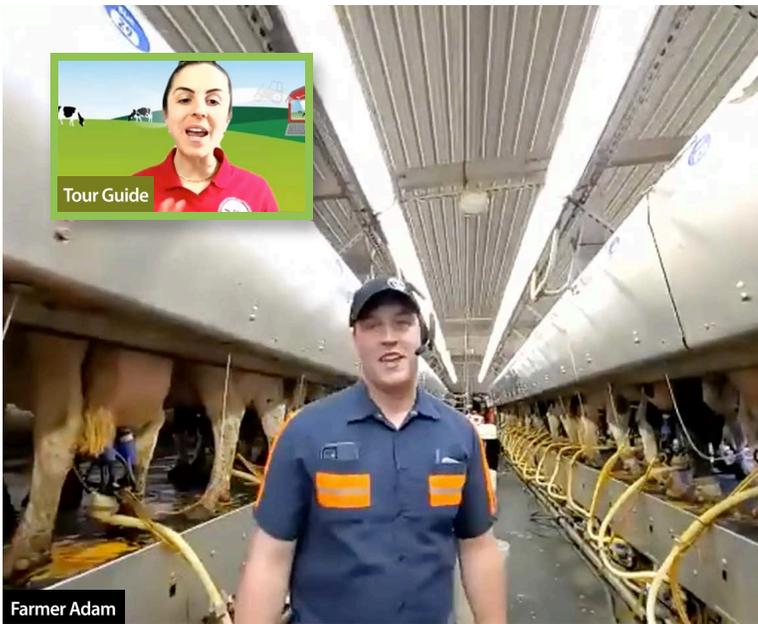
Cow Cam

The machine knows when the cow is all done being milked. So it simply releases, and then it falls away. And then she is done being milked.



Farmer Adam

Once the machine falls off of the cow, it drops down out of the way and we use a different teat dip. We dip the cow again. Basically what this does is ... when the cow goes back out into the barn, it makes sure that she doesn't get any bacteria or anything up into her udder or on her that can cause problems down the road.



[TOUR GUIDE]:

Got it! So cleaning before and cleaning after?

[FARMER ADAM]:

That's right. Yep - trying to make the cow as clean and as healthy as possible - that's the goal.



[TOUR GUIDE]:

Awesome! So now that we just saw some of those super cool milking machines, where is that milk going?



[FARMER ADAM]:

Sure, so we'll go this way. Below every milking unit, there's a hose that connects to a big metal pipe. And what that pipe does is collect all the milk from all the cows, and then the milk is taken to a central place.



Farmer Adam



Farmer Adam

So I know you guys can't feel it, but if I touch this pipe right now - the pipe is warm. And that's because the milk is coming out of the cow at the body temperature of the cow which is a little over 100 degrees. So it's quite warm.



Farmer Adam

Now, for that milk to go and become dairy products that you will see in the store, it can't be that warm. We have to cool it down. So we bring the milk into this first room here. It goes into a couple of jars.



Farmer Adam

And then the first thing we do is run it through some filters. What these filters do is help us collect any dirt that we might have missed when we were doing that process to clean the cow. So the milk runs through two filters here, and then ...



Farmer Adam

it immediately goes into this thing right here. We call it a "chiller," because that's exactly what it does. It has a bunch of pipes running through it, and we're running cold groundwater (water that we're getting out of our well) against the milk and pipes that touch.



Farmer Adam

And what that allows us to do is bring that milk from that 100 degrees that the cow is (a little bit over 100 degrees) and we can cool it down to the mid-50-degree range just by running it against cold water. That gets us a lot of the way down to where we need that milk to be, to be able to send it to the milk plant. But it doesn't get it all the way.



Farmer Adam

So then what we do is ... we take it again, and we run it through a second chiller. It's called a "glycol" chiller. So we're not using water this time, and what this does is allow us to get the milk down into that mid-30-degree range ... 34/35 degrees, somewhere in there.



Farmer Adam

And that's where we want the milk because then it will stay cold for quite a while.



Farmer Adam

So then what we do is ... after it goes through the chiller, it comes through a pipe along the wall here. And we have three doors here. Each door has a tractor-trailer backed up to it.



Farmer Adam

So right now we're putting the milk into this tractor-trailer down here. So it goes through this pipe that's bent right here, and up into the truck.



Farmer Adam

And we will fill this truck. The truck will only have our milk on it basically, so the truck stays here until it's full. It takes us a little over 12 hours to fill this truck. So we fill about two trucks out of this system every day, and then we have another system that's a little bit different, but we fill about another two trucks out of that every day.



Farmer Adam

Once the milk goes on here, because we've cooled it down so far, it keeps itself cool. So there's no process that we have to do at that point to keep the milk cold until it leaves. Then it just sits here until the truck comes and picks it up and takes it to the plant.



[TOUR GUIDE]:

Wow! And everybody loves cold milk, right?! That's the best way to enjoy milk.

[FARMER ADAM]:

Yeah, absolutely. And it's even better if you put a little bit of chocolate in it!



[TOUR GUIDE]:

Oh my goodness, Adam is a fan of chocolate milk. So, Adam, if you want to take us - actually, maybe - on a walk towards some of the cows, I have had a couple of questions come in. One of the questions asked was: How much milk does each cow give each day, and how many gallons is that?





Farmer Adam

[FARMER ADAM]:

So, our cows are giving up right around 90 pounds of milk a day or a little bit under (right around 88). And a gallon is 8.6 pounds of milk. So our cows are not quite producing 10 gallons of milk a day, but they're very close in that range. So that's a high producing number for cows, and we're quite proud of that number. It means that we're doing a lot of things right for the cows.



Tour Guide

[TOUR GUIDE]:

Well, that is really cool! So if you figure - if they're making that much milk in a day, it's split up between the three milkings, right? So that's how much they would give each time they get milked? We've got some division going on here for those of us that like math.



Farmer Adam

[FARMER ADAM]:

Right, so if she's producing 88 pounds of milk in a day, that's 88 pounds divided by three. So every time she's giving a third of her total daily milk.

[TOUR GUIDE]:

Very cool. Very cool! So where are we now, Adam? Can you tell us a little bit about where we are?



[FARMER ADAM]:

So right now, we are standing next to what we call our "sort area." Basically, what this area lets us do is ... it lets us work with the cows

whenever we have something going on with them that we need to check out - or just, you know - just need to do some stuff with them.

So, this area is situated right off the backside of the parlor so when they get let out of the parlor, they can walk through this area if we need them.



Now, I mentioned our Fitbits for the cows earlier. So it does all that stuff that we talked about before, in the parlor, but what we also do with it ... is - it will let us decide if we need to use this cow for something or bring her in an area to look at her.



So this thing can send a signal to a computer if we need to look at the cow. And what it'll do is ... it can open gates automatically so we can bring a cow into this area to take a closer look at her. If we don't need her, this thing won't give a signal to the computer, and she just goes right on back to her pen.

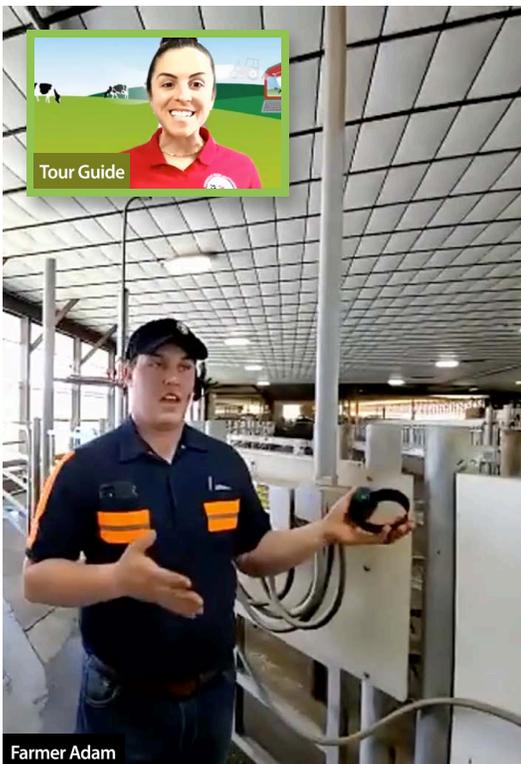


[TOUR GUIDE]:

Wow, that is super cool! So I have another question here before you move on from there. One of the questions that we had come in is: How old are the cows that are being milked?

[FARMER ADAM]:

Sure, so a cow doesn't start giving milk until she's about two years old when she births her baby. The youngest cows that we have, that are making milk, are around two years old, but we have some that are seven, eight, nine,... a few that might be even almost 10 years old. So there's quite a range once they start producing milk.

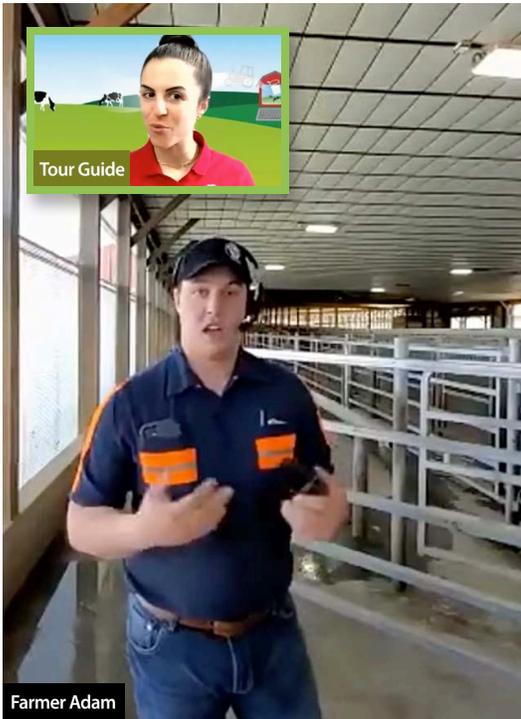


[TOUR GUIDE]:

Okay, and then another question that we had come in was: How many employees do you guys have to help you do the work on the farm?

[FARMER ADAM]:

That's a great question. So because we are milking cows basically 24 hours a day it takes a lot of people to do that. So in the barns and outside growing the food for the crops, we have over 65 full-time employees here. They're not all here at the same time, but throughout the week, we have 65 (and sometimes even more people than that) that help us to make sure that the cows get milked and are cared for every day.



[TOUR GUIDE]:

Got it. Very cool, very cool. So, now we had one more question come in that we'll answer before we're gonna actually show a really cool video and that is: How old do you have to be to work on the dairy?

[FARMER ADAM]:

That's a good question, too. On our farm we tend to hire... we have some high school kids working for us - so people that are in 10th, 11th, and 12th grade. So those would be people on the younger side. We have a lot of people that are in their mid-20s, but we even have some people that are in their 70s to almost 80. So we have quite a large range, but it usually starts at about the high school age.



[TOUR GUIDE]:

Wow! Very cool. And for those of us who just joined us, remind us again how many cows are on the farm, Adam?



[FARMER ADAM]:

Yep, sure thing. So, at Stauffer Farms here we have 3,800 mature cows (cows that give milk). Along with that number, we have young stock (or animals that aren't yet producing milk), and there are almost 3,000 more of them, as well.



[TOUR GUIDE]:

Awesome, so we're gonna take a quick break right now, and show a video about where the lovely little ladies that you raise go when they are between 60 days old and before they come back and have their first calf. So we're gonna check out your heifer facility.



[FARMER ADAM]:

Sounds good.



[FARMER ADAM]:

Hi, everybody! Right now we're at Forest View Heifers in Nicholville, New York. We're about five miles away from Stauffer Farms right now, and this is a custom heifer raising facility.



[FARMER ADAM]:

For those who don't know, heifers are young stock cows. So basically they are not calves, because calves drink milk, and a heifer does not drink milk anymore. And that goes all the way up until right before they have a calf (when they become a cow).



At Forest View Heifers, there are three local dairy farms that all bring young stock here to be raised. We bring a portion of ours here - about 900 animals because we do not have enough room for them in our current facilities. In total, there are about 3,400 animals here.



While we're here, we're going to explore the life cycle of a heifer.

Let's go!



[NARRATOR]:

Heifers take a ride on a trailer hooked up to a truck to get here to the heifer facility.



Once they make it, they are unloaded and have a chance to check out their surroundings.



They even get a little bit of time to kick up their heels before heading over to our processing center.





[NARRATOR]:

The processing center is where we are able to quickly and quietly handle the animals to measure different health parameters.



This includes weighing them, seeing how tall they are, and also giving them their vaccinations to help them get a healthy start here at the heifer facility with us.



Once they've been processed and we have all those health parameters, we send them on their way to the first barn they get to live in. Let's go check it out!





[FARMER ADAM]:

Once calves are processed, they get to come to the first pen that they live in. It's a big group pen where they get mixed with calves from other farms, so they learn how to live together in a group.



They have sawdust for bedding which helps keep them clean and comfortable, and they have food and water access 24 hours a day.



During the first few months that the heifers are here, it's very important that we make sure that they're healthy and off to a good start. So, along with regular monitoring of their health from a visual perspective, they also get vaccinations when needed. And they also get weighed four times while they are at Forest View Heifers.



We're now going to go and check out the next type of barn that the heifers live in which is a freestall barn.



[FARMER ADAM]:

Now we are in the first freestall barn the heifers get moved into here when they're a little over four months old. A freestall barn is the same style of barn that a mature cow lives in.



Basically what that means is... she has an individual stall that she can lay in, but she also has the ability to get up and move around to get food and water or just to hang out with friends.



Some special features about this barn are that we have curtains on the walls that help us regulate temperature and air quality depending on the season or the weather. We also have tubes that bring air in from the outside to help bring more fresh air in.



[FARMER ADAM]:

This is important. We want to make sure that the calves don't develop any respiratory issues because those can prevent them from growing well.



Our next step is going to be the next major event in these heifers' lives which happens at about a year old, and that is when they start getting bred.



Right now we're in the breeding barn at Forest View Heifers.



The animals come to this barn around 12 months old. This is one of those life moments where they would need to be weighed again like we mentioned before, so we kind of get a snapshot of where they're at in life and growth.



You also may have noticed that they have a blue circular ear tag. This is kind of like a Fitbit that we use to monitor their health.



It lets us see how well they're doing on eating and how much activity they get. And we use this information to know when it's time to breed them.



So you may have noticed that there's quite a bit of feed in front of these animals in what we call the feed bunk.



To feed all the heifers here, every day, it takes about 70 tons of feed.



And that 70 tons are comprised of hay, corn, and some grain that makes up some other nutrients that they can't get out of their hay and corn.



This has to be a balanced blend so that we are feeding the heifers to grow them properly.





This is the last barn that heifers live in at Forest View Heifers. While they live in this barn their job is to continue growing themselves as well as to grow their baby, because they are now pregnant.



After this barn, they'll go back to their home farm that they came from originally (where they will have their calf) as well as join the milking string and begin the milking process.



So now you've seen the life cycle of the heifer while she lives at Forest View Heifers.



Now we're going to go back to Stauffer Farms and see what happens when she gets back there.



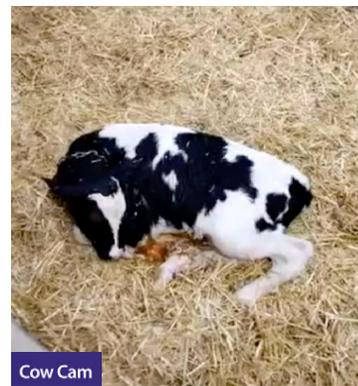
[TOUR GUIDE]:

Wow, Adam, that was really, really cool!

So we have had tons of great questions come in, and I'll just ask a couple of those questions of you right off the bat. So, we did have a question of: How many calves are born each day at the farm?

[FARMER ADAM]:

That's a good question. So, we have a lot of calves born here. On average, it's probably about 15 a day.



[TOUR GUIDE]:

Oh my gosh! And I think we are seeing a brand new addition here on the farm!

So how old would this little girl be?



[FARMER ADAM]:

That's right. The calf that you're seeing on the Cow Camera right now was born just about an hour ago - a little bit before we started this.



[TOUR GUIDE]:

Well, that is pretty, darn cool! Thanks for sharing that. So, tell us, Adam, a little bit about where you're at now.



[FARMER ADAM]:

[This area] is on the back of the parlor that we were visiting. And all the animals that are in this barn are going to have a baby within the next three weeks. So on average, there are usually about 200 cows in here that are gonna have a baby in the next three weeks.



So right now I'm standing in what we would call a Calving Pen. So this is one of the areas that we'll bring a cow from the freestall part of the barn that she's currently living in. We'll bring her here for when she's ready to have the baby. We bring her right before she has the baby.



So she's out there being a cow right up until it's time to go, just like moms when they go to the hospital.



Cow Cam

In this pen, you'll see that it's got a lot of straw in it.



Cow Cam

And, then within an hour of the calf being born, we feed the calf what is called colostrum. So basically what this is - is super-rich milk. It's super-rich in nutrients for the calf, and this is very important to do because the calf is born without much of an immune system.



Cow Cam

So what that means is that it's very easy for that calf to get sick if they're exposed to bacteria. So that's why it's very important for us to keep this area clean and the next area that the calves go to live in so that they can build up some immune support and be ready to fight any bugs that they might come into contact with.



Tour Guide

Farmer Adam

[TOUR GUIDE]:

Great, Adam. Can you move more towards the cows for us and head over that way?

[FARMER ADAM]:

We sure can. We will go around this gate right here ...



[TOUR GUIDE]:

So in the meantime, Adam, I can ask you some more of these awesome questions that come in. So one of the questions that have come in is: Do you have any boy calves - or bull calves - on the farm?

[FARMER ADAM]:

We do not have any here. What we do is - any bull calves or "boy" calves that are born - we keep them for a few days, feed them, and start to help them grow. And then, we sell them to someone else who raises bull calves for a living.

[TOUR GUIDE]:

Very cool. Very cool. Thanks for sharing that. So Adam, tell us about where we are now.



[FARMER ADAM]:

Sure. So right now, we're in the freestall part of the barn, where the cows live before they have their babies. And this is a very similar barn to where cows live after they have their baby as well.

We call it a freestall barn because she has the option to lay in a stall when she wants to. But, she's also free to get up and walk around and go drink water or eat feed whenever she wants to as well.



So this is a really nice barn because it lets the cow just be a cow and do whatever she wants to do. You'll notice that some of these cows are laying down. Some of them are standing up. So they're really doing whatever they want. It's a really great environment to live in.



[TOUR GUIDE]:

Wow, they look super comfortable. Okay, can you tell me what they are laying down in?

[FARMER ADAM]:

Sure. So they are laying in sand. It's the same exact kind of sand that you'd see if you went to the beach.



It's very deep in the stalls that they're laying in. We like sand because it moves with the cow and it gives, so it's kind of like a memory foam mattress. It will do whatever the cow wants it to do, so she's very comfortable laying in the stalls.



[TOUR GUIDE]:

Very cool. Very cool. Can you show us, Adam, how big those stalls are? I bet they have to be pretty big to fit your cows.

[FARMER ADAM]:

They're really big. Cows are very big animals, so because of that, the stall has to be very big to fit them.

I'm kind of a tall person, but if I lay down in the stall like this, it's longer than I am with my arms all the way up. So it's very comfortable right now. It's like laying on the beach. Actually, I could stay there for quite a while.



[TOUR GUIDE]:

Well, that's pretty awesome. So how much does a cow weigh?

[FARMER ADAM]:

That's a good question, too. Cows are very big animals. They start out big when they're born, as well. Our calves average about 75 to 85 pounds when they're born. So that's a very big baby.

So that means that their mothers are very big as well. Our cows, on average, weigh around 1,400 to 1,500 pounds as a grown-up.



[TOUR GUIDE]:

Wow, very cool. So we got asked a couple of other questions. What is the oldest cow that you guys have?

[FARMER ADAM]:

I'm not sure, off the top of my head, how old the oldest cow is, but I think we have a few that are pushing 10 or 11 years old.



[TOUR GUIDE]:

Wow, very cool. And so obviously they're producing milk that long, too?

[FARMER ADAM]:

Yup. They've been producing milk for a number of years to be that old. And that means that they've also had quite a few babies to do that, as well.



[TOUR GUIDE]:

So how many babies does a cow have in a year?

[FARMER ADAM]:

Basically, a cow has one baby a year. They're pregnant for nine months, just like a human is. That cow has to have a baby to begin making milk originally, and then every year, she has to have another baby to keep producing milk.



[TOUR GUIDE]:

That makes sense. Now we had another question come in: What are those tags in their ears - those earrings that they're rocking?



[FARMER ADAM]:

That's a really good question. So this is another way, like the Fitbit, that we can identify the cows and learn a little bit more about them. So you'll notice on the ear tag that there's a big number in black.



That is her id number. We can go into the computer and we can search that number to get a whole history about the cow. It's like going to the doctor's office, and the doctor having all of your records. We learn her birthday. We learn who her parents are. We learn when the last time she had a baby was or if she's had a baby yet. And, like I mentioned in the Forest View video, we can learn how much they weighed every time they got weighed. There's a lot of information that we can get just from knowing her tag number.



[TOUR GUIDE]:

Wow, very, very cool. Now, it looks like it's pretty nice where you are in the barn. Is it cool? Is it comfortable?



Farmer Adam

[FARMER ADAM]:

It's very comfortable in here today. These are really nice barns. I like them a lot because they really cater to making sure that the cow is most comfortable at all times.



Cow Cam

One of the unique features of these barns is that we do what is called tunnel ventilation. It's very important that cows have fresh air at all times. It helps keep them healthy.



Cow Cam

So what we do in this barn ... On the end wall of our barn, we have lots and lots of fans. Basically what we do when it gets hot out is ... we turn those fans on and it kind of sucks air through the barn. It brings it in one end that's wide open, and then it takes it all out the other end through the fans that we have.



Cow Cam

When this is going, there's a very nice, gentle breeze in here. So even if it's a really hot day (90 - 95 degrees) outside, it's very comfortable in here for the cows and the people working with them.



It's also a really cool system because, with the breeze that it creates, it doesn't allow the flies to attack the cows or to be around the cows. Flies like cow manure. We have a lot of cow manure. So when we have a breeze, the flies can't fly in that breeze so it allows us to not have any flies that might bother the cows.



[TOUR GUIDE]:

Well, that is pretty awesome. So, Adam, these ladies look like they are lounging in these stalls. How long will they spend just laying down?



[FARMER ADAM]:

Cows will lay down I think basically as much as we let them. So they'll definitely lay down for close to half a day, maybe more, if they have the ability to. So these cows are basically on vacation right now. They're just waiting to have their babies, so they're doing whatever they want.



So, this cow that's next to me right here ... she's just having a great time. She's checking us out to see what's going on, but if we weren't here she would just be hanging out doing her thing.



[TOUR GUIDE]:

So when cows are laying down, it looks like some of those cows are chewing. Is that right?

[FARMER ADAM]:

They are. Yep, they should be. That's called "chewing their cud."



So something very different between a cow and a person is a cow has four sections of its stomach. And for the cow to properly be able to digest the feed that we feed her, she has to chew that food multiple times. It's not like a human where we chew our food, it goes into our stomach, and that's the last time we think about it.



They will take food that's in their stomach that they already ate, bring it back up into their mouth, and chew it some more after it's been in there for a while. So what you see them doing when they're laying down is ... they went over to the feed bunk. They got some feed. They came back down, and now they're just chewing it and digesting it. So that's what you're seeing there.



[TOUR GUIDE]:

Oh, that makes a lot more sense. Okay, so we've seen them chewing, but what are they eating and drinking during the day? Can you show us that?

[FARMER ADAM]:

I sure can. We'll come to the end of this pen over here ... this is a smaller pen that we have. Here, we only have it on the ends, but in some of our bigger pens, we have water tubs in the middle as well. A water tub is (as you'll see in a minute) ...



just this bathtub-sized plastic bowl that the cows get to drink out of any time of the day that they want to. It's very important that we have these because cows drink a lot of water.

Mature cows will drink about a bathtub full of water per cow every day. So that's a lot of water that we have to be able to provide to the cows.



[TOUR GUIDE]:

Oh my gosh! That is a ton of water. That's pretty cool, though. So now we want to see what are your cows eating.



Farmer Adam

[FARMER ADAM]:

Yep, so we'll come on the outside of the pen here, and we will come out into what we call the feed alley. So basically, this is where we feed the cows every day.



Farmer Adam

So what we have, in front of the cows here, is what we call the Feed Bunk. It's very similar to what you saw in the video from Forest View, and this is where the cows get all the food that they want to.



Cow Cam

We feed the cows once a day. We start very early in the morning. The feeders start at three o'clock in the morning, every day, to start feeding the cows. And what they do is ... they drive a big tractor that has a big mixer on a wagon. So it's basically a big bowl that's got a couple of spoons in it. (That's a good way to think about it.)



Cow Cam

And what we do is ... we put all the ingredients for the cows' feed into that mixer and it helps us create what we call a "TMR." So it's this Total Mixed Ration that's all uniformly mixed. And what we create is basically like a casserole. Every mouthful that the cow eats gets all the ingredients in the recipe. The mouthful she gets is the same every single time that she takes a bite.



[TOUR GUIDE]:

So there's no way to pick around your vegetables?

[FARMER ADAM]:

That's the idea. If the cows could, they would just eat the grain, because that's kind of like the candy. And they wouldn't eat the hay which is very similar to like the lettuce or the broccoli. But by mixing it all up like that, we ensure that they get a little bit of everything every time. So it keeps them happy, and it keeps us happy as well.



[TOUR GUIDE]:

Okay, so I have to ask. Are you guys growing that feed? Or are you ... how many acres does it take to grow all that delicious food for the cows?

[FARMER ADAM]:

So we, ourselves, have about 4,400 acres of land that we use to grow crops for the cows. And we're growing hay and corn for the cows. We then also work with two other neighboring farmers who are pretty close to us. And they grow about 1,100 acres of additional crops for us because we don't have enough land to do it all ourselves.



[TOUR GUIDE]:

That makes a lot of sense. Okay, so I'm curious now. What are the four main components that make up that cow's food that she's chowing down on?



[FARMER ADAM]:

Yep, so the cow has, like you said, four main ingredients that are in her diet. A big one for us is corn silage. That's corn that you might see growing, you know, as you drive down the side of the road. It's different from "people" corn. This corn is specific for cows. So it wouldn't taste good for us to eat it like corn on the cob. But that's a big ingredient that's in there.



We also have hay that we chop up. We cut hay four times a year, and that is another big ingredient. The hay and the corn are the two ingredients that we grow ourselves on the farm.



We also have grain that we purchase from a feed mill. We work with a dairy nutritionist. That person is a nutritionist, like for a human, except they worry about the nutrition of the cow. We work with them to make sure that we're feeding the cows the right nutrients, the right minerals, the right vitamins - all that stuff - to keep the cows healthy and for them to be able to produce milk. So that's another big part of what they eat.



And then this diet (for these cows that are going to have a baby) has a lot of straw in it which is a little bit different than our other diets for cows. The straw doesn't have a lot of nutritional value, but it's what we call a filler. When we put the straw in there, it helps the cows get full, but it allows us to keep them full without letting them eat too much. And if they were to eat too much, they could get fat. And we don't want the cows to get too fat. We want them to be happy and full, but we don't want them to be super full.



[TOUR GUIDE]:

Right, that makes a lot of sense. So, I have some other great questions coming in that I would love for you to answer. So we had a question come in asking: When did the farm start?

[FARMER ADAM]:

Stauffer Farms was started by Sandy Stauffer in 1977. He moved here from Pennsylvania and began farming that year. He did not have this many cows when he started. He only had about 50 or 60 cows. So the farm was considerably smaller back then. Since then, his two sons Aaron and Ben have come back to the farm and they're now owners of the farm as well. And they've helped grow this farm to the size that it is.



[TOUR GUIDE]:

That is pretty cool. So, Adam, we know that you're our Farmer Adam. So how did you end up on this farm?

[FARMER ADAM]:

I'm not from this area originally. I'm from about four hours south of here, near Albany, New York, in a town called Cobleskill, New York. I grew up going and visiting my grandparents' dairy farm. My parents are not involved in farming, but I really liked it so I went and spent a lot of time with my grandfather and my uncle when I was growing up. I then went to college for farming and agriculture, and through that, I made connections with this farm. And that's how I started. I came here for a summer and then I came back after I was all done with college.



Tour Guide

[TOUR GUIDE]:

Very cool. So we did have a couple of other questions about the maternity area. So two questions for you: Do cows ever have more than one calf at a time? What happens if a cow needs help when she has a calf?



Cow Cam

[FARMER ADAM]:

Those are really good questions. So yes, cows can have more than one baby at a time. It's not uncommon for cows to have twins. We don't have a lot of twins born here, but it does happen sometimes. Cows can have more than that. They can have triplets or even quadruplets, but that's very rare. I've never seen that personally. I've seen twins and just single babies, but I've never seen triplets or anything like that.



Cow Cam

And then sometimes cows do need help, so that's a really good question. Most of the time, they're able to do it on their own. But sometimes, the heifers who have never had a calf before are not really sure what's going on. So we need to help them a little bit to understand what they're trying to do. In order to do that, we have a person that works our maternity barn 24 hours a day. Every half an hour, they walk through all the pens, and they look for anybody that's having a baby. They're also responsible for feeding those newborn calves that colostrum that I talked about earlier to get the calves off to a good start. And then, if a cow does have trouble, they are there to help that cow. They don't have to help every cow, but it is nice to have someone there just in case she does need a little bit of help.



Cow Cam

[TOUR GUIDE]:

Wow, that's really cool. So we also had a question: What happens with these cows behind you if maybe they're not producing very much milk or if they're not pulling their weight, so to speak?



Cow Cam

[FARMER ADAM]:

Sure. So ... usually, if a cow gets into that sort of situation where she's not making as much milk as she used to or like you said, she's not pulling her weight, we usually will pull those cows out and do a physical on them and determine if there's anything wrong with them. If it's determined that they aren't going to keep producing milk like we'd like them to, we often do end up selling those cows, and they get used for something else.



Tour Guide

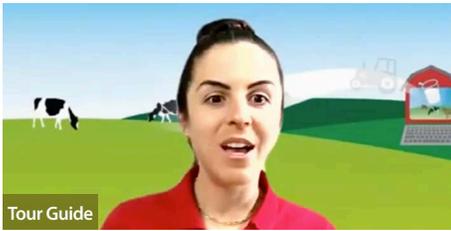
Farmer Adam

[TOUR GUIDE]:

Okay, that makes a lot of sense and then we had a very interesting question here: How much does it cost to feed all those cows?

[FARMER ADAM]:

It costs a lot of money to feed all these cows. I do not know the number exactly, but to feed the 3,800 cows that are here we're feeding almost half a million pounds of feed every day. So it's a lot of money that it takes to feed the cows every day, but it's worth it because it keeps them healthy and it helps everyone out.



Tour Guide

[TOUR GUIDE]:

That makes a lot of sense. And you told us - which is really cool - that you guys only buy part of the feed, because you grow part of it.



Cow Cam

[FARMER ADAM]:

Yeah, we ourselves can produce about three-quarters of it, but then we do have to buy a little bit extra to help meet the need so that we are able to feed the cows the exact same thing every single day of the year no matter the weather or the temperature or anything like that. They're able to get high quality feed every single day.



Farmer Adam

[TOUR GUIDE]:

That is awesome. So with that being said, because you explained to us that these cows need to be fed every day and taken care of, do your employees ever get days off?

[FARMER ADAM]:

Oh, yes! Our employees do get days off. Everybody that works here has some time away from the farm. Historically, when on smaller farms it's a little bit harder to get away for people because the cows have to be milked every day. They have to be fed every day. So if you don't have a lot of help, it's harder to get away and maybe take a vacation or go and visit people. But, we're lucky that because we have so many people working here, everybody's able to take a day or two off a week depending on what they want to do. So everyone that works here can enjoy life besides just working on the farm.



Tour Guide

[TOUR GUIDE]:

Well, that's awesome! So we had another great question come in: What is the most recent technology that's been implemented on the farm?



Farmer Adam

[FARMER ADAM]:

Oh boy! That's a really good question. We use a lot of different things. Probably - we don't quite have it yet - we'll have it in a few months - but, we're building some new barns to put the heifers (that you saw in that video) in.



Cow Cam

And one of the things that those barns are going to have is curtains on the walls that are connected to a thermometer that reads the temperature. So that means on days where it's cold or windy or really sunny and hot, the curtains will automatically adjust themselves based on what we need to keep those animals comfortable. So I'm really excited about that.



Cow Cam

We don't have that anywhere else right now, so we have to do all the work of opening and closing curtains and doors and stuff like that ourselves. So this barn will take care of itself completely like that. We won't have to worry about it, and it'll be a really great environment for the animals to live in.



Tour Guide

[TOUR GUIDE]:

Well, that is pretty darn cool. So we had a couple of other questions come in here: Do you name your cows? and: Was there ever a number one cow since you number your cows?



Farmer Adam

[FARMER ADAM]:

Some of the numbers of these cows that I'm standing next to are in the 12,000s, the 11,000s, or the 13,000s. We actually at one point started over again. So right now, I don't know where she is, but there is a number one walking around somewhere!



Cow Cam

There's a number one in one of these barns. In general, we do not name the cows. With all the animals that we have, it would be a lot of names to come up with, and we'd have to be getting pretty creative. But there are a few special cows that stand out. People have given little nicknames to some. While they still have a number, they might have a nickname that people call them as well.



Cow Cam

[TOUR GUIDE]:

Got it. That makes sense. Okay, we had another great question come in: How do you farmers make money? How are you paid for your milk?

[FARMER ADAM]:

Yup. We sell the milk to a cooperative, and a cooperative is a company that helps us to sell the milk to people who can turn it into dairy products that you might see in schools or the grocery store. We work with them, and they help us coordinate the milk leaving the farm and then going to the milk plant every day to get turned into dairy products.



[TOUR GUIDE]:

Wow, that's pretty cool. So maybe you want to give us an example, Adam, because I don't think you guys get paid by the gallon, right (not like the way we buy it in the grocery store)?

[FARMER ADAM]:

Nope, that's right. As I mentioned earlier, how we measure how much a cow produces in a day by pounds. We also get paid based on pounds. We get a certain dollar price per every hundred pounds of milk that we produce. We call that a "hundredweight." We have a price per hundredweight that gets paid to us for the milk that we sell from the farm.



[TOUR GUIDE]:

Fantastic! Okay, so we've been talking a lot about cows. So I have one more cow question here: How many hours does a cow sleep in a day?



[FARMER ADAM]:

I don't know an exact answer to that question, but I know that it's probably a lot more than I do! More often than not, when I'm walking through the barns, I'll see a cow laying down and she looks like she's in the middle of a really good dream. And sometimes I wish that I could just lay down there too and do the same thing. But, I would say that it's on average just as much as a person ... so at least eight hours. And probably more, because they don't have to have a real job like we do. They just get to lay around all day long and be a cow.



[TOUR GUIDE]:

That's pretty awesome. Now we've talked a lot about cows, but we had some people wondering: Do you have any other animals on the farm?

[FARMER ADAM]:

We actually do not. Every once in a while there might be a cat or something that we see, but there are no horses or pigs or anything like that. We just have cows here.



[TOUR GUIDE]:

You focus on cows, and do the best you can with those cows! That makes a lot of sense.

[FARMER ADAM]:

Yep. That's exactly what we do.



[TOUR GUIDE]:

We had a student ask: Do you have contests for the cows? What is the highest producing cow? How much milk is she making every day?

[FARMER ADAM]:

So, it's not necessarily a contest, but it is interesting to look and see which cows are giving the most amount of milk. I actually did this the other day because I was curious as well, and we had a couple of cows that were making 160 - almost 170 pounds of milk every day. That's a lot of milk. We don't have very many cows doing that, so it's really impressive to see a cow that can do that.



[TOUR GUIDE]:

Oh my, gosh! That is a ton of milk. That is so cool. So, Adam, I'm also wondering with all these cows, do you plan to get any more cows, or is this the max number of cows?

[FARMER ADAM]:

For right now, with where we are at with barn space for the animals, this is as big as we can get. However, if we were to build some more barns, we would be able to milk more cows in the future. There's no plan to do that right now, but it's definitely a possibility going into the future.



[TOUR GUIDE]:

Okay, that makes a lot of sense. So we're able to see on the Cow Cam right now outside, and it looks like there's a giant pile of something out there. Can you tell us what that is?



[FARMER ADAM]:

Yeah, those are the feed piles. Remember those ingredients that you saw in the white buckets a little while ago? Before the feed ends up in front of the cow, and before it ends up in the mixer, we put it into a big pile, and that's how we store it until we need to use it. So what we do is ... we use a chopper which chops the feed up for us in the field; we put it into a truck; the truck comes back to the farm and

dumps it; and then, we use big tractors that have blades on the front to push it all up into a pile and pack it down. The reason we pack it down is that we don't want oxygen to get into the feed. The oxygen will cause the feed to spoil, and if it spoils we won't have enough feed for the cows for the next year. After we're done doing that, we cover it with a big white tarp which is plastic and then put tires all over it to help protect it even more.



[TOUR GUIDE]:

Wow, that seems like a pretty intense process! Are you guys working on growing feed year-round or is it seasonal?

[FARMER ADAM]:

It's definitely seasonal. We can't do much growing of feed during the wintertime. It gets very cold here and very snowy. Since we can't grow any feed then, it's very important for us to focus on growing feed during the warm times of the year so that we have enough when it's really cold out. Right now, because we're in the middle of spring, things are kind of crazy for the guys that are out driving the tractors. We're planting corn right now, so they're getting the ground ready to be planted. So it's a very exciting time to be on the farm.



[TOUR GUIDE]:

Very cool so we've got some more questions rolling in. How many barns are on the farm?



[FARMER ADAM]:

In the facility that we're in right now (we're in one of the barns) there are five barns in total. But, they're all connected. I can walk in between all five barns where the mature cows are and not have to go outside. That's so that we can move cows around to put them where we need them. We don't have to worry about trying to take them outside and then getting them back inside (because that can be a hassle).



[TOUR GUIDE]:

That makes a lot of sense. So, I've had multiple students asking this question: Do you have a favorite cow, Adam?

[FARMER ADAM]:

Yeah, I actually do have a favorite cow. I have some of my own cows that I keep here. There are a few of them that I'm pretty fond of. I can go and see them every once in a while, and they're friendly. I'll go and give them a scratch on the head and see how they're doing. So yeah, I do have some favorite cows.



[TOUR GUIDE]:

That makes a lot of sense. Well, Adam, we have answered pretty much all of these questions. Is there anything else you want to share with our students before we close up our tour for the day?

[FARMER ADAM]:

The only thing that I'd like to share with you guys is that ... you know, like, I'm doing this now, and I didn't grow up on a farm. So, if you have an interest in something, but you didn't grow up around it - or you're not familiar with it - don't be afraid to try and go and learn it. Or, if you want to be involved with something, find people who will let you hang out and learn stuff. It's a great way to see what you're interested in, and you might find something that you want to do for the rest of your life along the way.



[TOUR GUIDE]:

So, that's very cool. It sounds like there is room for everybody on the farm, whether you grew up on a farm or not.

[FARMER ADAM]:

Yep. That's exactly the point.



[TOUR GUIDE]:

Well fantastic, Adam. We are so grateful for your time today showing us all the great ways you guys take care of your cows and the land - all to make those delicious dairy products that end up at schools. Oh, I apologize, Adam. Can you do one more question for me?

[FARMER ADAM]:

I can. Yeah.



[TOUR GUIDE]:

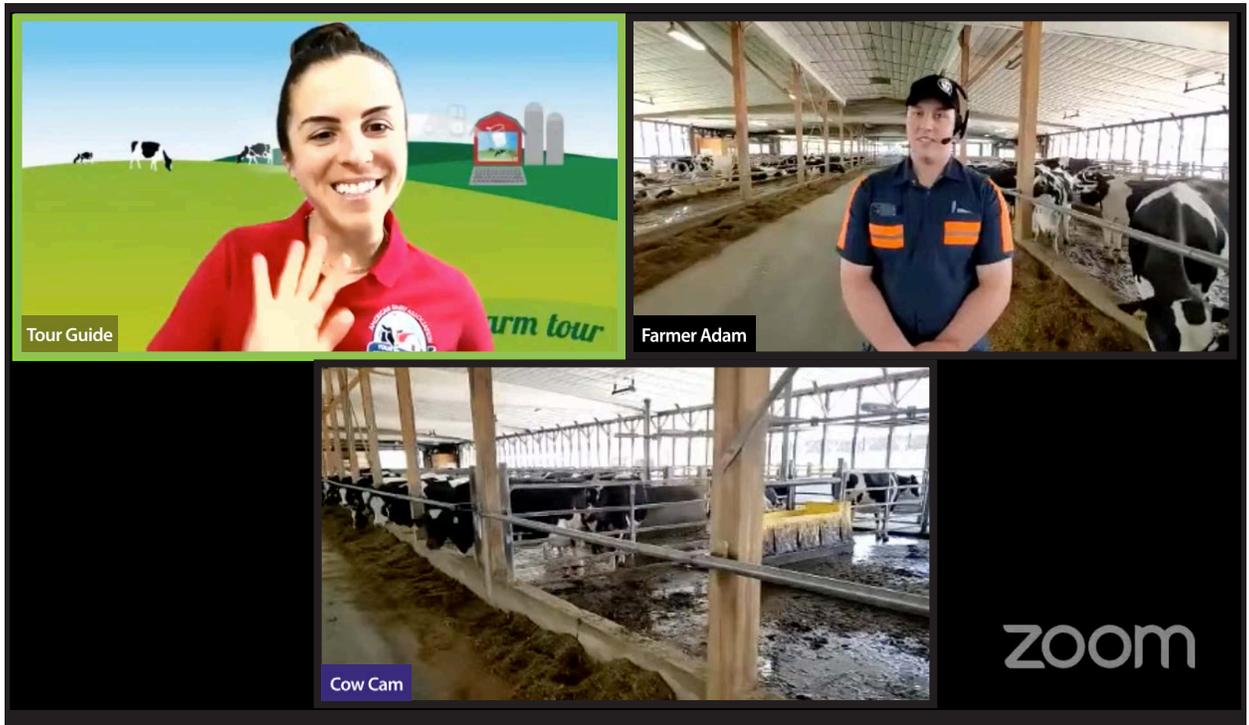
Okay, so for all those students out there that are probably about to head to lunch or maybe just had lunch ... Adam, what was your favorite dairy product that you had in school when you were growing up?

[FARMER ADAM]:

My favorite dairy product, as I mentioned before, is chocolate milk. I liked it in school, and I still drink quite a bit of chocolate milk now even though I'm not in school.

[TOUR GUIDE]:

Awesome, so you still share in the chocolate milk love. I like it.



[TOUR GUIDE]:

Again, Adam, thank you so much for your time. Thank you to all of the students for joining us - whether you joined us live or you watched us on a replay later. Don't forget you can always check out this video on YouTube or our Facebook page, and we are the American Dairy Association North East. Thanks, Adam. Thanks, everybody for joining us.



Activity 3

- Complete the Activity Worksheet on page 81
- Following the completion of the worksheet, educators should have a discussion with students (if this is being used in a classroom setting. Otherwise, the information can be read by the student and discussed with an adult or parent.) using the following to guide:
 - o Nutritionist: Most dairy farmers feed cows a high-nutrition blend of grains in addition to pasture grass.
 - o Tech Expert: Dairy farmers rely on high-tech equipment, like robotic milking machines that can milk each cow automatically whenever it's ready.
 - o Environmentalist: Dairy farmers use sustainable practices like composting cow manure and recycling water.
 - o Veterinarian: Dairy farmers monitor their cows' health for signs of illness, poor nutrition, and injury.
 - o Mechanic: Dairy farmers need the skills to keep all kinds of farm machinery working properly.
 - o Carpenter: Dairy farmers need the skills to build almost any structure that will help keep their farm productive.
 - o Computer Specialist: Dairy farmers use computer systems to manage all aspects of the farm, from energy use to milk production and the health of the herd.



Activity 1 Dairy Farmers Do It All

Reproducible Master

Part 1 Being a dairy farmer requires many skills. Read Farmer Steve's to-do list for today. Then match each of his tasks to the corresponding job title.



Farmer Steve's To-Do List

1. Mix feed for the cows.
2. Clean and test the robotic milking machines.
3. Update manure composting plan.
4. Examine newborn calves.
5. Repair tractor.
6. Design and build an equipment shed.
7. Input the day's milk production on the farm management system.

Job Titles

-  **Mechanic**
-  **Computer Specialist**
-  **Veterinarian**
-  **Nutritionist**
-  **Tech Expert**
-  **Environmentalist**
-  **Carpenter**

Which task on the to-do list would you most like to help Farmer Steve complete? Why?



Activity 4

View the video screenshots and narration from the video, "Sustainability/Recycling," which is about sustainability in dairy farming on pages 83-92.

- Learners: Complete the Activity Worksheet on page 93.
- Educators: If you are facilitating this in a classroom, have a discussion with students about sustainability.

View the answer key at the end of the lesson on page 95.





Sustainability/Recycling

Also available online at: www.youtube.com/watch?v=Lo5Vfz3Bp-E



Dairy farmers are among the original recyclers in our society.



They not only do it to preserve and protect our environment, but they also recycle because it simply makes financial sense and contributes to their farm sustainability.



One of the most important resources on the farm is water.



First and foremost, it is used for the cows to drink.



But it's also used to clean up the parlor and ...



clean out walking lanes in the barn.



It's used in misters and ...



cooling fans in the barn when it gets hot, and ...



it is also used to cool down the milk before it reaches the bulk tank.



Water isn't free, and it's a relatively finite amount, so getting the most out of each gallon is paramount on farms.



Sand and other bedding can be recycled by rinsing, pressing and drying it before reusing

Sand and wood shavings from the freestall barns are often recycled.



They can be rinsed with water, and then special presses can remove the manure and moisture from the bedding. Then it can be dried out and reused in the barn.



Most farmers will tell you that cows are great at two things: making milk and making manure.



We know what happens to the milk, but manure is becoming a big part of the sustainability story.



Many farmers already use manure to provide a source of nutrients for their crops.



They have special tractors with tanks and hoses that can spread the nutrients right on their fields.



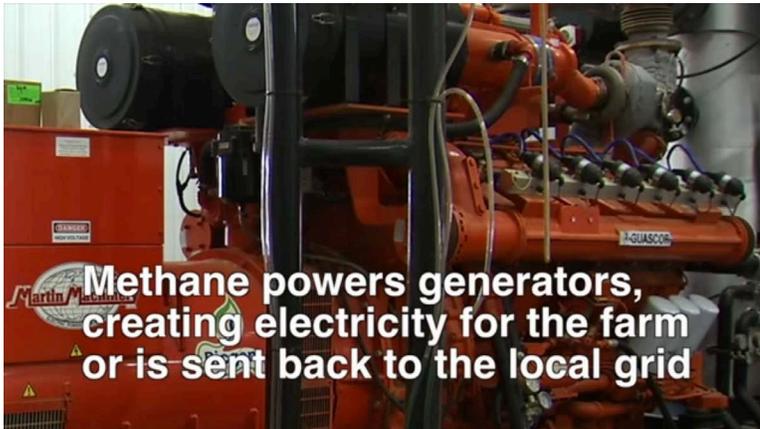
This is a very popular way of getting extra value from all that cow manure, and it saves a lot of money from having to buy fertilizers.



But some farmers are putting that waste right to work on their farms in the form of energy and electricity.



There are devices called methane digesters that can take the raw manure, combine it with specialized bacteria and produce methane gas.



That methane gas is then used to power generators that produce electricity.



That electricity is then used to power all sorts of things around the farm, making it virtually self-sufficient.



But also, this valuable resource can be sent back to the grid and sold by power companies to the farmers' neighbors.



Some farmers are also taking advantage of all the acreage they have that can't be used for crops or grazing or even the tops of their barns, and they're turning them into solar farms.



They're putting up solar arrays on the land or panels on top of their barns or other buildings and harnessing the rays of the sun to power up their farms, equipment, and homes.



A couple of other practices that have been used for years because of their environmental benefits are no-till or low-till farming which can be used in conjunction with cover crops.



No-till or low-till farming simply means that whatever organic matter remains in the field is allowed to decompose with very little tilling or amending after a harvest.



Then seeds of whatever the next crop is will be put right into the ground, with the previous crops decaying organic matter serving as fertilizer and protection from erosion.



Also, special cover crops can be planted over a harvested field, such as certain types of grass or even another crop.



But, it protects the soil from water or wind erosion and also adds nutrients like carbon and nitrogen back into the soil.



All of these together can improve the overall health of the soil for current and future plantings.



These practices all sound green and environmentally friendly, and they are.



But, farmers simply think of them as good business practices because they're taking advantage of what they already have around them and using it to make money or save it.



Farmers are well aware that they have to take special measures to protect the air, water, and land they're on so that it's safe and productive for the cattle, but also so that it can be passed on to future generations just like the generations did before them.



Activity 2 Farming for the Future

Reproducible Master

Part 1 Dairy farmers care for the communities where they live. They work to protect natural resources like water, soil, and air by practicing environmental **sustainability**. That means finding ways to restore natural resources and recycle waste, so that Earth's ecosystems remain healthy far into the future.

Read about some of the ways dairy farmers practice environmental sustainability. Then match each of these sustainable farming practices with a similar practice at home by writing the correct letter in the space.



Sustainability on the dairy farm:

- 1. Use new technologies, like methane digesters, to help save energy.
- 2. Compost cow manure to keep the community's air and water clean.
- 3. Use recycled materials, like sand, to make bedding for cows.
- 4. Use recycled water for things like washing barn floors and irrigating fields.
- 5. Grow grains and other crops for feeding cows directly on the farm.



Sustainability at home:



- A.** Collect plastic, glass, paper, and metal for recycling into new products.
- B.** Turn off lights, computers, televisions, and other electrical appliances when not in use.
- C.** Grow a vegetable garden at home, or eat food grown in your area.
- D.** Take short showers instead of baths and turn off the faucet when brushing teeth.
- E.** Compost fruit and vegetable waste from meal preparation and leftovers.



Activity 5

Make This Recipe-Homemade Butter (Adult supervision required)

Without dairy farmers taking care of cattle, we would not have products like milk, cheese, butter, or ice cream! In this activity, we will learn how to make butter from heavy whipping cream!

Materials and Ingredients:

- Glassware with lid (mason jar)
- Heavy whipping cream
- Biscuit or cracker for tasting

Directions:

1. Fill your glass jar about halfway with whipping cream, you need room to shake the cream!
2. Make sure the lid of the jar is on tight and then shake the jar.
 - a. Note: Making butter requires a bit of arm strength, so you might need some help!
3. Check your jar every 5 minutes to see the changes.
4. After the first 5 minutes, there is no real visible change. At the 10-minute check-in mark, expect to see whipped cream.
5. Keep shaking for homemade butter!
6. Be sure to try your butter on a biscuit or even a cracker!

Post-Assessment

Answer the following questions:

1. How often are cows milked?
2. What types of things do cows eat for nutrition?
3. What kind of products can we get from cows' milk?
4. List 4 new words you have learned
5. Optional: What was your favorite part of the Virtual Farm Tour?



Discuss with family:

1. Draw a picture with a two-sentence summary of what life looks like on a dairy farm.
 2. Share it with a family member or friend to teach them about dairy!
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Answer Key

Activity 4: "Farming for the Future" (page 93)

1. B
2. E
3. A
4. D
5. C