



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

Instructor	Jaycie Heath
Grade Level	9-12
Lesson Title	Robotic Milker (In Person, Scheduled or Unscheduled)

TEACHER PREPARATION

Learning Goals & Standards/Performance Indicators	
Learning Goals	Standards
1. Upon completion of this lesson students will be able to identify basic functions of the DeLaval VMS-V300 Robot and identify how this technology can improve the dairy industry.	1. <u>AFNR FPP.01.01.01.a</u> Trace the steps milk undergoes when it leaves the dairy. 2. <u>Discuss recent technological advances in dairying.</u> <input type="checkbox"/> Biology 2.2, 3.3 <input type="checkbox"/> AFNR AS.06.02.02.a, BS.03.01.02.a 3. <u>Discuss the history of the dairy cattle industry and its role today</u> <input type="checkbox"/> Environmental Science 3.1,3.2, 3.3, 5.1, 5.2 <input type="checkbox"/> Grade 9: Language Arts 4.1.a, 4.2.c <input type="checkbox"/> AFNR AS.01.01.01.a
Resources and Materials	
<input type="checkbox"/> Visuals in the center <input type="checkbox"/> Student tour guides <input type="checkbox"/> DeLaval VMS <input type="checkbox"/> Dairy Herd Manager, Nicole Sanders	
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

- As time progresses there are labor shortages in traditionally agricultural fields, such as the dairy industry. What is one way that we might be able to combat this without risking production levels? (take a few answers, predominantly looking for technology-based responses)
 - Utilizing new technology can serve as a major advantage to improve efficiency in industries with labor shortages, one way we are able to improve efficiency in the dairy industry is through the introduction of robotic milkers, like the one we have here at the Ferguson Family Dairy.

Direct Instruction

1st Learning Goal: Upon completion of this lesson students will be able to identify basic functions of the DeLaval VMS-V300 Robot and identify how this technology can improve the dairy industry.

Content Outline	Instructional Strategies
<ul style="list-style-type: none"> • In a traditional dairy setting cows are milked in a parlor twice a day. Depending on the size of the parlor only a limited number of cows can enter at one time and each cow must have her udder cleaned and the milker attached/detached by hand. Milking cows this way increases the amount of time spent in the parlor for the dairymen when they could be performing other tasks on the farm. <p><u>Meet our Robotic Milker!</u> (from Nicole Sanders, Dairy Herd Manager)</p> <ul style="list-style-type: none"> • This is our DeLaval VMS-V300 Robot, it can milk up to 60 cows per day and we have about 55 cows who are entered in the system to utilize the robot. • Each cow spends on average about 6 minutes and 30 seconds in the robot and sets her own daily milking schedule, with some stipulations on the number of times she can be milked. <ul style="list-style-type: none"> ○ This helps keep the cows more comfortable by giving them the freedom to decide when they need to be milked, in a traditional parlor system the people milking set the time that the cows are milked each day. A comfortable cow is more productive and therefore can produce a higher quality product. The robot provides us with the opportunity to maximize production in our cows by allowing them to be milked more often throughout the day. • Entry into the robot is completely voluntary and it only took the initial group of cows about a month to learn to use the robot. Now, the first group of cows can help train new 	<ul style="list-style-type: none"> • For this lesson I think it would be best to have students positioned in front of the robot viewing window so they can see cows enter and the statistics on the monitor as the lesson goes on. • Encourage students to ask questions throughout and it will be important that they can observe the cows using it in order to form higher level thinking questions.

1st Learning Goal: Upon completion of this lesson students will be able to identify basic functions of the DeLaval VMS-V300 Robot and identify how this technology can improve the dairy industry.

cows on the robot and it only takes about two weeks for them to begin using it regularly.

Why do we have a robot? (From DeLaval VMS)

- *Direct students to the monitor as it reports data from the cows;* As you can see, the robot captures vast amounts of data from every milking, from every cow - even from each quarter. The robot can tell us:
 - Milk flow
 - How much milk she gave last time versus this time.
 - How many times she has been milked in the robot.
 - And more, all in real time, and all specific to one cow.
- The DeLaval robot constantly measures each cow's milking performance and adjusts accordingly to milk her- this includes how it attaches and when it detaches the milking cups. This personalization can result in faster and less stressful milking, allowing for more milkings per day and shorter waiting times for cows.
- We can see all the reported information in detailed visual reports that the robot sends directly to our herd manager, Nicole. This communication between the robot and Nicole allows workers here to track when cows go into the milker, how often they are being milked, and Nicole can change how many times each cow can be milked based on the cow's individual performance, age, and lactation stage. This means that the robot can be tailored to work the best for each cow.
 - Our herd manager gives permission for how many times each cow can be milked a day, and the robot knows this. As the cow enters the robot it scans her tag and knows if she has maxed out her number of milkings in one day or not. If she doesn't have

1st Learning Goal: Upon completion of this lesson students will be able to identify basic functions of the DeLaval VMS-V300 Robot and identify how this technology can improve the dairy industry.

- permission to be milked again the front gate opens and she leaves.
- Using a robot can also improve cleanliness while milking.
 - It prepares each quarter of the udder for milking by using a combination of teat spray for disinfection and the DeLaval PureFlow™ cup for proper cleaning.
 - The robot uses a separate, dedicated cup to reduce the chance of cross-contamination or residue during the preparation stage, before beginning to milk the cow.
 - Once attached, the DeLaval PureFlow™ cup uses a unique combination of air, water and optional DeLaval PureFlow™ cup cleaning additive to clean, stimulate and strip the teat to get ready for milking.
- The robot has also provided student workers with the opportunity to gain hands on experience with up-and-coming methods of milking. We can even provide students with the ability to network with members of the industry. This allows students to form relationships with perspective employers. (Nicole Sanders, Dairy Herd Manager)

Learning Activity

- Students should be encouraged to label a diagram of the robot with benefits of its use, identify what information the metrics screen displays, and anything else that helps the students remember the robotic milker.

Assessment

- Questioning:
 - How might robotic milkers be utilized to help the dairy industry?
 - How does the robotic milker customize milking to each cow?

1st Learning Goal: Upon completion of this lesson students will be able to identify basic functions of the DeLaval VMS-V300 Robot and identify how this technology can improve the dairy industry.

- How is the robot helping students?

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