



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

Instructor	Jaycie Heath
Grade Level	Adult
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 visitors will be able to identify basic functions of the DeLaval VMS-V300 Robot and identify how this technology can improve function, efficiency, and cow comfort.	1. N/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 visitors to the Ferguson Family Dairy, introduce self and what you do for the dairy, etc.	

LESSON DELIVERY

Anticipatory Set

<ul style="list-style-type: none"> As time progresses there are labor shortages in traditionally agricultural fields whether that is due to more people pursuing higher education or the misconception that agriculture doesn't have something to offer in multiple disciplines. One such industry facing these labor shortages is 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) <ul style="list-style-type: none"> Utilizing new technology can serve as a major advantage to improve efficiency in industries with labor shortages, one way we can 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

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Content Outline	Instructional Strategies

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- In a traditional dairy setting cows are milked in a parlor twice a day. Depending on the size and style 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 and labor spent in the parlor. When labor is abundant this is not an issue, however for the dairies who are understaffed this use of time is inefficient when they could be performing other tasks on the farm.

Meet our Robotic Milker! (from Nicole Sanders, Dairy Herd Manager)

- 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. We do not have the robot at full capacity because to do so would crowd the cows in the freestalls on this side of the barn and it is important that they are always kept comfortable.
- 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.
 - 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

- For this lesson I think it would be best to have visitors 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.

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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 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 attention 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 teat. The robot can tell us:
 - Milk flow
 - How much milk the cow gave last time versus this time.
 - How many times she has been milked in the robot in a given day.
 - 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 not only in real time on the viewing screen, but also in detailed visual reports that the robot sends directly to our herd manager, Nicole. This communication between the robot and Nicole allows workers to track when cows go into the milker, how often they are being milked, how much they are producing at each milking and Nicole can change how many times each cow can be milked based on the cow's individual performance, age, and

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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 recognizes if she has maxed out her number of milkings in one day or not. If she doesn't have permission to be milked again the front gate opens and she leaves.
- Another way the robot improves comfort for each cow is by identifying her on entry and automatically adjusting the length of the stall to better fit her.
- 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.
 - During this process pre-milk (about 45 seconds worth of milk in her udder and teat cisterns ready for evacuation) is collected, transported and dumped for each cow, using separate lines and containers to

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ensure there is no risk of cross contamination.

- Not only does the robot benefit the dairy as a business and the cows, but 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

- Adults should be provided with the option to take an informational handout that covers basics about the dairy, how to schedule tours, and animal science department contact information.

Closure

Closing Announcements/Reminders

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