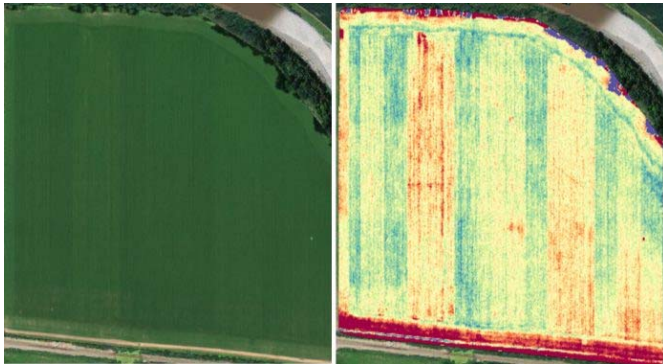


EXPLORING VERMONT DAIRY

TECHNOLOGY ON THE FARM



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Our social code:



- Please remain muted unless you are talking.
- Click “Raise Your Hand” if you would like to speak, then unmute yourself when called on.
- Share on-topic thoughts & questions in Chat. (Remember that the chat is recorded and is visible to the presenters.)
- This presentation is being recorded so please speak clearly
- Be courteous, respectful & brave!
- Manage your video and sound to be present and minimize distractions
- Ask questions and share your ideas!



Where we have been and where are we going?

- ▶ Mechanization of agriculture - 1900 to 1930
 - ▶ Each farmer produced enough food to feed about 4 people
- ▶ Green Revolution - 1960s
 - ▶ New methods of genetics, production of hybrid crops
 - ▶ Each farmer produced enough food to feed about 26 people

2020 and beyond - advances in technology

The average farmer in 2020 is producing twice as much as the previous generation.



Technology is changing Vermont Dairy Farms

What types of technology can you think of that have changed Vermont dairy farming in the past :

10 years

20 years - we know these changes happened before you were even born

Were your Grandparents farmers? How do you think things might have been different for them when they were your age?

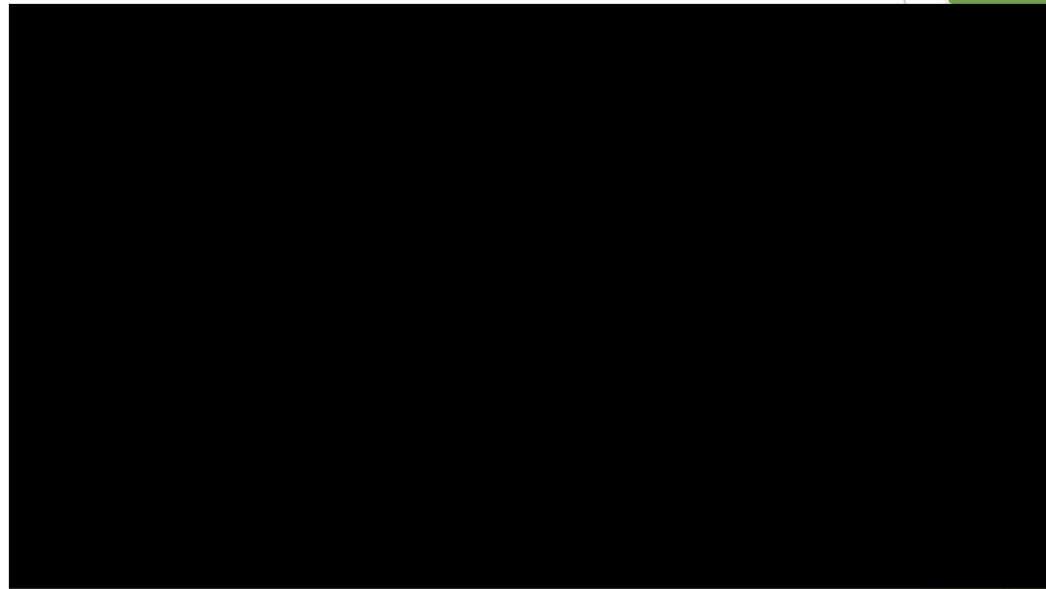


Robotics – more than milking cows

Calf feeders
Feed pushers
Feeding Systems

What are some of the
advantages of using robotics ?

Disadvantages?



<https://youtu.be/nL9L19AfR8>

Technology on the Sweet Farm:

After viewing the video of the Sweet farm in Fletcher, Vermont let's discuss some of the technology that was shown:

Why did the Sweet family choose to go to a robotic milking system?

What are some of the advantages they mentioned to having a robotic milking system?

What other form of technology was shown:

How often does the automatic feed pusher push the feed up to the cows?



The reality of robotic milkers:

How many cows can each robotic milker handle? Each robotic milker can milk approximately 65 cows - milking each cow multiple times per day.



- ▶ What would you estimate a robotic milker would cost per unit?
- ▶ If your guess was \$200,000 then you are correct
- ▶ How many units would you need for a:
 - ▶ 100 cow dairy
 - ▶ 500 cow dairy

You do the math:

- ▶ So what would the cost be for the units for a 100 cow dairy?
- ▶ So what would the cost be for the units for a 500 cow dairy?

Manure Handling



How has manure handling changed:

From horse and flat wagon to injection the secret is getting the nutrients to the plants and keeping runoff out of the waterways.

How have Required Agricultural Practices Impacted the way farmers handle manure on the farm?

What practices have helped farmers improve water quality?



For a complete list of Vermont Required Agricultural Practices go to: <https://agriculture.vermont.gov/rap>

How technology works at Stony Pond farm in Fairfield , Vermont



<https://youtu.be/nL9L19AfFR8>



Animal Identification and Records



Why is animal identification important?

What is traceability?

Why is traceability necessary?

Drones

How can drones be used on dairy farms ?



A birds-eye view of:

- Feed and crop management

 - Software allows drones determine estimated crop yields from the sky before the crop is even harvested

 - Observe for pest management

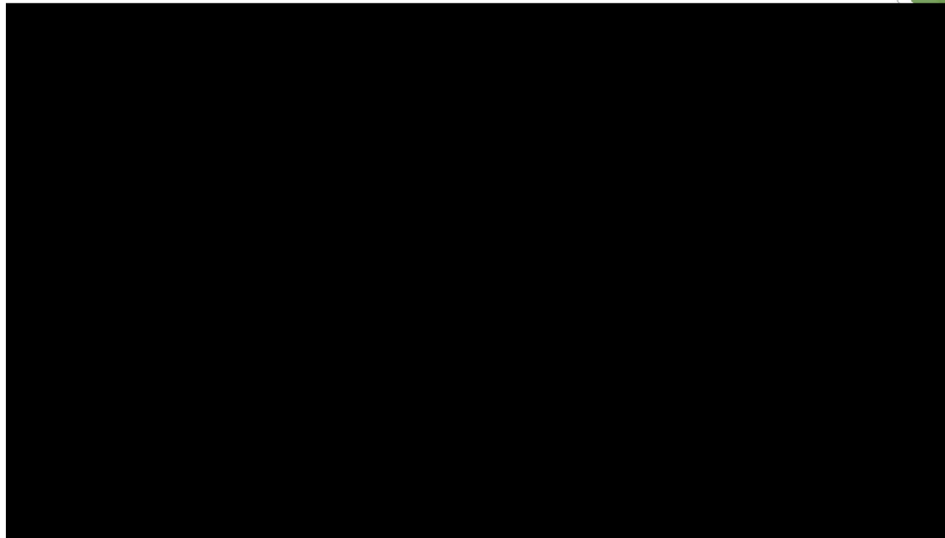
- Pasture

 - Thermal scanning allows for heat detection from the sky

 - Where are the cows spending their time?

Reasonably low cost

Precision Cropping



<https://www.youtube.com/watch?v=gqxXgvwIASY>





Genetics and Breeding

What is Genomic testing and why is it an important tool to farms of all sizes:

“The study of the role of nucleic acid sequences in cellular DNA that are associated with animal (including human) performance or trait expression. For dairy cattle, one important current use of genome sequences is to predict genetic merit of dairy animals for economically important traits. Other uses include recognition of “Mendelian” traits, such as polled-horned, coat color, and some genetic recessives formerly discovered through pedigree relationships. ”

Bennet Cassell Professor Emeritus Department of Dairy Science Virginia Tech

https://www.vtdairy.dasc.vt.edu/content/dam/vtdairy_dasc_vt_edu/docs/cow-colleges/2012cc/paper-23-cassell.pdf



Three polled heifers at Cherry Crest Farm



Why are farmers interested in polled cattle/

Studies at Virginia Tech have shown that using genomic sequencing allows for genetic improvements at 2.5 times the rate that those same improvements could be made without the sequencing?

Advantages? Disadvantages?

Why is Dairy Farming Important to the Vermont Economy?

What's Growing in Vermont?

- **Dairy Products - \$493 million:** A dairy cow produces about 6.3 gallons of milk each day and 350,000 glasses of milk in a lifetime.
- **Cattle and Calves - \$88.7 million:** A steer typically weighs about 1,000 pounds and yields about 450 pounds of edible meat.
- **Maple Products - \$46.5 million:** It takes roughly 40 gallons of tree sap to make 1 gallon of maple syrup which weighs 11 pounds.
- **Hay - \$13 million:** Sheep and goats refuse to eat

Information from Farm Flavor <https://www.farmflavor.com/vermont/vermont-crops-livestock/vermonts-top-10-ag-products/>

Wrapping it up:

- ▶ What technologies that we have talked about today do you think will have the greatest impact on the future of dairy farming in Vermont?
- ▶ Which ones would you like to learn more about?



Want to know more about technology on Vermont Dairy Farms ?

Read two or more of these

How is Shelburne Farms is trying to manage manure pit odor

<https://vtdigger.org/2019/08/04/dairy-looks-to-ancient-technology-to-manage-manure-odor-runoff/>

The Goodrich farm of Salisbury Vermont adds and anaerobic digester

<https://energynews.us/2020/05/19/vermont-dairy-farm-hopes-anaerobic-digester-can-provide-financial-boost/>

Small Waitsfield Vermont farm uses Technology to make a profit on a small farm

<https://grist.org/food/dairy-tale-new-tech-could-turn-small-farms-into-the-land-of-milk-and-money/>

Foster Brothers Farm in Middlebury VT Named Innovative Farm of the Year

<https://www.idfa.org/news/foster-brothers-farms-in-vermont-named-innovative-dairy-farmer-of-the-year>

North Williston Cattle Company uses Technology to measure conservation impacts

<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/home/?cid=NRCSEPRD388820>

Half Moon Pond Farm - the Sweet Family in Fletcher, Vermont

<https://youtu.be/nL9L19AfFR8>

Join us next week, Tuesday November 2nd,
as we look into **Animal Health and Animal
Nutrition** on the farm



Curious about how to [join 4-H](#) or become a Vermont 4-H Volunteer?

Call: 1-800-571-0668



Visit our [4-H At Home](#) page to find virtual programs, livestock activity sheets, lesson plans, our YouTube channel, and more!