



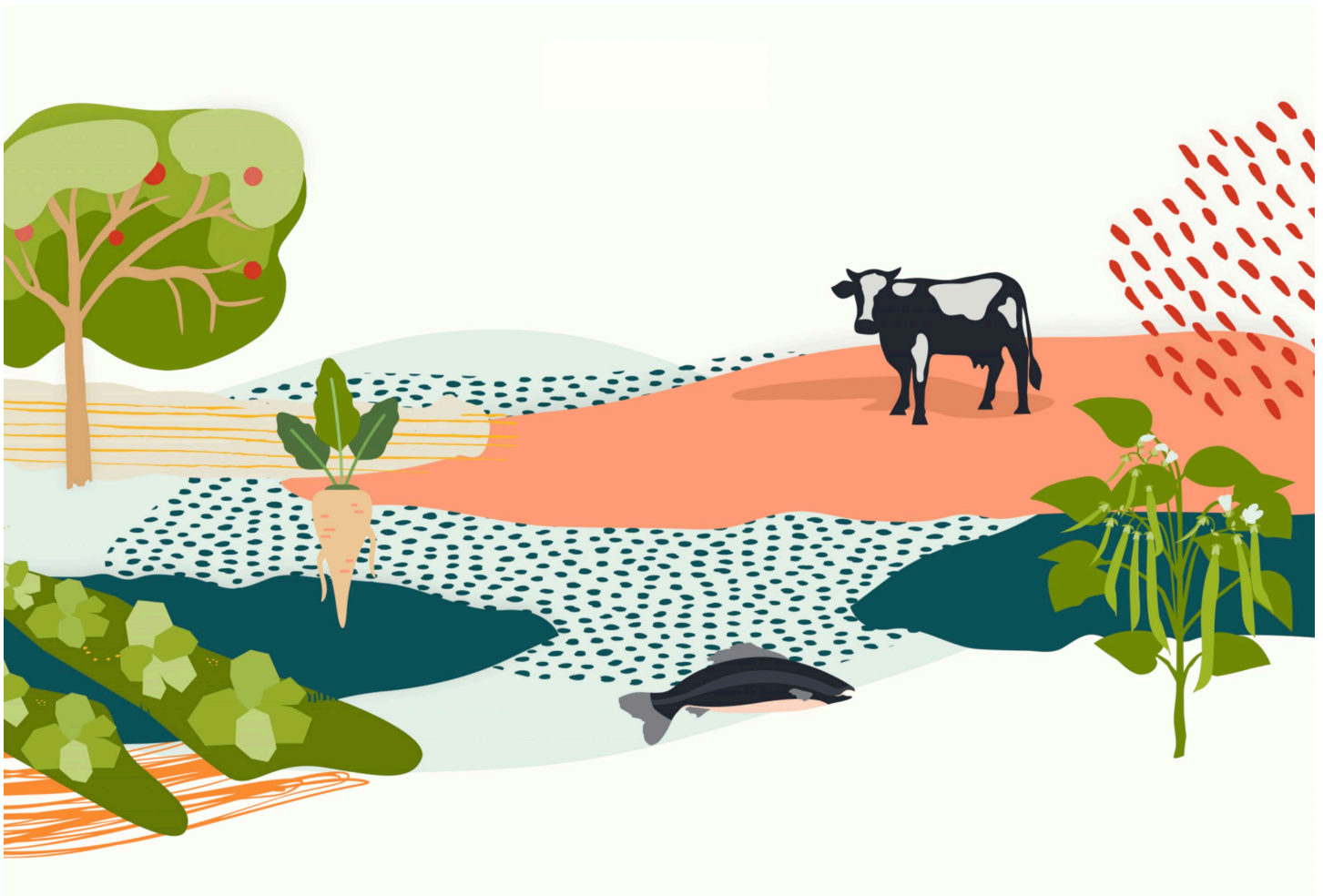
# Dairy Products

## **INSTRUCTOR GUIDE**

Elementary School– Middle School - High School

### Table of Contents:

1. Dairy Products Instructor Guide
2. Dairy Products Student Pre-Video Activity Sheet
3. Nellie Holsteins Video Instructor Guide
4. Nellie Holsteins Video Student Worksheet
5. Venn Diagram Worksheet (MS/HS)





## BACKGROUND

Wisconsin Farm Technology Days 2021–Eau Claire was hosted on Huntsinger Farms July 20 - 22, 2021. Innovation Square and the Farm Tours featured six innovative farms that are producing food for Wisconsin, the Nation and beyond using the latest farming practices and technology to position their farms for the future with sustainability, yield, quality, and taste in mind.

Our continuing mission is to educate the general public about the changing face of agriculture and **to inspire and educate youth** about the many different exciting careers associated with agriculture. The all-volunteer Executive Committee commissioned a new online resource to bring the farms from Innovation Square and the Farm Tours to the people of Wisconsin who could not attend the show.

These farms are: Chippewa Valley Bean/Doane Farm, the largest processor of red kidney beans in the world; Ferguson's Orchards, the largest producer of apples between the Rocky Mountains and Lake Michigan, Huntsinger Farms/Silver Spring Foods, the largest grower and processor of horseradish in the world, Marieke Gouda/Pentermann Farm, the award-winning farmstead Gouda cheese company, Nellie's Holsteins, a recently expanded and modernized 5<sup>th</sup>-generation dairy, and Superior Fresh, the largest aquaponic – hydroponic farm in the world.

The website is <https://chippewavalleyfarming.com>.

In addition, agriculture educators at Chippewa Valley Technical School and Holmen High School developed a full suite of educational materials for Elementary, Middle School and High School youth to be used alongside the videos and background featured on the website free of charge to all educators.

All the instructor guides and student work sheets are available as downloadable Word documents on the website (<https://chippewavalleyfarming.com/education/>) so that teachers can edit them to fit their curricula. We hope your students of all ages will enjoy learning about farming different crops, herds and fish in the Chippewa Valley and be inspired to learn more about agriculture as a hobby or career.



# Nellie's Holsteins - DAIRY INSTRUCTOR GUIDE

Elementary School – Middle School – High School

Professional Video, Background, Overview and Activities at  
<https://chippewavalleyfarming.com/nellies-holsteins/>

## ELEMENTARY SCHOOL LEVEL

### Objectives

- I will be able to identify 10 or more dairy products made from milk.
- I will be able to explain what I know about the dairy industry.
- I will be able to work with my peers.
- I will be able to listen to Nellie Holstein owners share about their dairy operation.
- I will be able to explain where the dairy farms are located around our community.
- I will be able to write a letter to a farmer and send it in the mail.
- I will be able to identify which dairy products my family consumes at home.
- I will be able to illustrate what a dairy farm looks like.

### Interest Approach

1. Place several dairy products in front of the classroom.
2. Items like a carton of milk, an ice cream bar, or a yogurt container to name a few. (You could even borrow these items from your school nutrition services department, so you do not have to go out and purchase them).
3. Ask students to identify what all the products have in common.
4. Once they have identified the commonality that they are all dairy products move to Nellie Holsteins Pre-Video Activity of “What can milk get processed into”.



**Pre- activity: “What can dairy milk get processed into?”**

1. Print “What can dairy milk get processed into”. Either one per student or one per group.
2. Pass out the handout and place it upside down on the students desk. Direct them not to touch yet.
3. Have a song playing system ready to go while they work.
4. Give the following verbal directions. “When I say the “go” word “flip” you will do so to the piece of paper in front of you. You will have the length of the following song to fill in this sheet with as many dairy products as you can. Specific products such as cheddar cheese, and blue cheese will be accepted, (but of course since I just gave you those ideas no one can use cheddar and blue cheese for their C and B words now). Fill in as many alphabet letters as possible within the length of this song. Once the song is complete, we will determine who has the most full and unique dairy product list. Be sure to keep your conversations quiet so your classmates do not take your ideas. What questions are there on this task? Alright, “FLIP”.
5. Start the song you wish to play. Then walk around the class to gage previous knowledge of dairy products.
6. Once the song has elapsed, call for time and instruct the students to put down their writing tool.
7. Assign a student to pass out another writing tool to each group (or have each group grab another writing tool that is different than the one they used to complete the activity). i.e if they wrote with a standard pencil originally give them a purple-colored pencil.
8. Read the next set of directions. “We will now go group by group to hear all of your answers. When it is your group's turn, slowly read each letter and then the product you placed there. If you are in a different group from the one that is reading and you have the same product on your list, shout out, “GOT IT” and then BOTH the group reading and the one that shouted will cross off the product. If you read off a product and no other group has that product, then you can place a star next to it. Once you have read all of your letters and the dairy products you have placed next to them, count up your stars. This is how many unique dairy products your group thought of. Once each group has been able to share their answers, the group with the highest number of unique products will win a special prize (I suggest a dairy treat from the lunchroom).



9. Once all have read and a winning group has been determined have a brief discussion using the following discussion questions.
  - a. Raise your hand if there was a dairy product listed that you have never heard of. What was that product?
  - b. What are your favorite dairy products?
  - c. What kind of animals produce milk? (cows, goats, sheep are the most common in US)
  - d. Stand up if you have ever consumed a dairy product. (everyone will most likely be standing up.)
  - e. Since each of us consume dairy products, we should learn how the animals that provide us with nutritious and delicious products are raised and cared for. We will now learn about Nellie Holsteins, a 5th generation dairy farm in Eau Claire, WI.

## Video

1. Print and handout Nellie Holsteins- Video Sheet.
2. Watch the video.
3. Give students a few minutes to answer questions 9-11 on the video sheet which are not included in the video.
4. Go through the video with the students asking for their input, discuss the questions from the video sheet and other ideas that come up.



## MIDDLE SCHOOL LEVEL ACTIVITY

### Purpose

Experience a variety of milk products.

### Objectives

I will be able to use my senses to determine the characteristics of the milk products provided.

I will be able to participate in a discussion regarding the milk product tasting I have had.

### Directions

1. Pick up a variety of real milk products from your local store.  
Suggestions include:
  - a. Whole milk
  - b. 2%
  - c. 1%
  - d. Ultra pasteurized 1%
  - e. Ultra pasteurized Chocolate
  - f. Goat's milk
  - g. Sheep milk
2. Give the students as many dixie cups as you have types of milk.
3. Have students label their cups with numbers, one for each milk, i.e. 1-8 if you have 8 different options of milk.
4. Prior to students coming in- transfer milk from the original container to a generic one like a clear pitcher. Be sure to keep track of which milk is which.
5. Give each student a few ounces of each milk in their corresponding container.
6. Have them taste each milk and determine which specific milk they are consuming and record on their Milk Tasting Sheet



7. You can either provide them with a word bank of specific milk options on the board or on their Milk Tasting Sheet.
8. Once all have consumed and guessed, share the correct answers and discuss why a consumer would buy one milk product over the other.  
A few reasons may be:
  - a. Ultra pasteurized has a longer shelf life
  - b. Chocolate is sweeter than white milk
  - c. Whole milk is good for growing children
  - d. Skim milk has less fat

Feel free to challenge a student's thinking of societal norms. For example- people think fat = bad so they should drink skim milk, challenge them on the pros of whole milk... etc.

NOTE: if you have a student who is lactose intolerant, you could also include alternatives to milk or make them your assistant and help pass out supplies.



## Milk Tasting Sheet

### Directions

Fill in this table as you taste the different types of milk. Write down the specific type of milk you think you have just consumed.

To help you if you get stuck, write down some characteristics of the milk as well, like thick, sweet, watery, etc. so you can go back and change your answers if need be.

You could also just take a sip of milk the first time, so you have another sip to try later if you find yourself in a tie!

You can also include a confidence level, like “for sure”, “questionable”, “come back to”, and “total guess” etc.

Keep your answers to yourself, let your classmates make their own decisions.

<b>Example:</b> watery, thin, white, cold Skim Confident	2.	3.
4.	5.	6.
7.	8.	9.





## HIGH SCHOOL LEVEL ACTIVITY

### Purpose

Compare and contrast Raw Milk vs Pasteurized Milk vs Ultra Pasteurized Milk.

### Objectives

I will be able to explain the different methods of pasteurization.

I will be able to determine which method of pasteurization allows for higher bacterial content to be present.

### Directions

#### PART 1

1. Purchase two identical milk products with one being pasteurized and one ultra pasteurized. Obtain raw milk from a dairy farmer for educational use and not consumption. (i.e. 2% pasteurized cows milk from Kemps and 2% ultra pasteurized milk from Kemps). The only variable to want is the type of pasteurization.
2. Pass out the "Raw vs Pasteurized vs Ultra Pasteurized Milk Venn Diagram" or instruct students to create their own.
3. Discover the difference between raw, pasteurized and ultra pasteurized milk.
  - a. Read this information from International Dairy Foods Association <https://www.idfa.org/pasteurization>
  - b. Watch this video: <https://www.youtube.com/watch?v=fgDSPy54w-E>
4. Give each student two dixie cups, have them label the cups as A and B.
5. Prior to students arriving or in a hidden area, pour the milk into a generic container so students do not know which milk is just pasteurized and the milk that is ultra pasteurized.
6. Pour students a tasting of the pasteurized milk in cup labeled A and the Ultra pasteurized milk in cup labeled B. (Do not tell them which is which yet.)



7. Have students continue on their sheet as they try the two products.
8. Ask students which product they think is which.
9. Give them the correct answer and talk about any differences they may have noticed.
10. Discuss reasons why a consumer may choose one product over the other.

## PART 2

1. Have students work in pairs. Each pair needs three test tubes with caps and a permanent marker.
2. Label 1 test tube as Pasteurized, Ultra Pasteurized and raw with the students names on them as well.
3. Students will then fill the test tube with 10 mL of the corresponding milk.
4. Then using a pipet, they will add 1 mL of Methylene blue solution.
5. Place the cap on the test tube and shake for a few seconds.
6. Keep the test tubes in the fridge and wait two days to see what differences in bacteria are present in the three types of milk.  
Simply put:
  - a. The whiter the milk, the more bacteria present.
  - b. The bluer the milk, the less bacteria present.

### Notes:

- a. Be sure to enforce no drinking of these milks.
- b. Use these resources to dive deeper into what the Methylene Blue solution
  - i. <https://labmonk.com/methylene-blue-reduction-test-for-milk>
  - ii. <https://www.sciencedirect.com/science/article/pii/S0022030230935205>
- c. Remember that not all bacteria is bad



## Conclusion and or Extensions

1. Ask the students if they know any dairy farmers or if they have driven past one around your community. Connecting the students with a dairy farmer in your own community can give much value. Look on google maps to show the students where the farm is in relation to the school, in relation to their home.
2. Look up the website or Facebook page for your county or town dairy breakfast. Send a note home to families in May (most dairy breakfasts occur in June) encouraging them to attend!
3. Connect with a local dairy farmer to do an in person or virtual tour of their farm. Have the students create questions prior to the tour and take turns asking the questions. Once the tour has concluded, have the students create a summary on flipchart or poster paper using photos and words from what they experienced and hang their work on the classroom or hallway walls.
4. Have the students take a photo of all of their dairy products they have at their home and share with the class the following day.
5. Write individual or an all-class letter to a dairy farmer in your area. Teach students how to write a formal letter, find a mailing address, address the letter, and send it through USPS. This can be a thank you letter or an inquiry letter asking them questions about their operation.



Name: \_\_\_\_\_

**What can dairy milk get processed into?**

A.

B.

C.

D.

E.

F.

G.

H.

I.

J.

K.

L.

M.

N.

O.

P.

Q.

R.

S.

T.

U.

V.

W.

X.

Y.

Z.



NAME: \_\_\_\_\_

## Milk Tasting Sheet

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Example:  Watery, thin, white, cold  Skim  Confident	1.	2.
3.	4.	5.
6.	7.	8.



## Pasteurization Venn Diagram

