



YOGURT AND CHEESE

What is It?

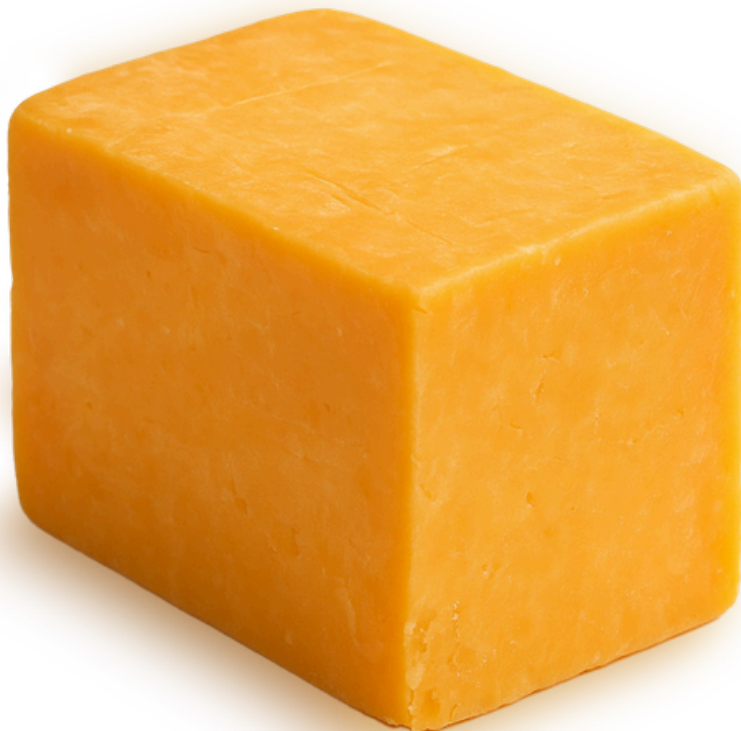
- Most yogurt and cheese in the United States is made from cow's milk, which comes from dairy cows raised on farms.
- People around the world also consume milk from different animals including goats, sheep, donkeys, horses, oxen, buffaloes, and camels.
- To make cheese and yogurt, milk is combined with helpful bacteria that change its texture and flavor, forming curds for cheese and a smooth, tangy product for yogurt.
- There are six main dairy cattle breeds in the United States, including: Holstein, Ayrshire, Brown Swiss, Milking Shorthorn, Guernsey, and Jersey. The Holstein cow produces the most milk of all breeds, about nine gallons of milk per day! Each cow produces an average of six to seven gallons per day, which is 2,500 gallons of milk annually.
- Besides the amount of milk produced, different breeds produce varying amounts of milk fat and protein, making them more or less suitable for making dairy products like cheese and yogurt.



Cows, credit: OSPI



Cows, credit: OSPI



Make It

Be sure to follow local Food Safety rules and regulations. Learn more here: [Food Safety Rules and Regulations](#) | [Washington State Department of Health](#).

Recipe: Yogurt Parfait
Yield: 4 servings

Ingredients	Directions
<ul style="list-style-type: none"> • 1 cup sliced strawberries or blueberries, fresh or frozen • 2 cups unsweetened yogurt • 1 cup banana or peaches, fresh or frozen • 2 tablespoons honey or 100% fruit jam • 1 cup low-sugar granola or oat cereal 	<ol style="list-style-type: none"> 1. Cut fruit into small pieces. 2. In a bowl, mix the yogurt and jam or honey together. 3. In each of four serving containers, layer 1/4 cup fruit, 1/4 cup yogurt, and 2 tablespoons granola.

Recipe adapted from [EatFresh](#).

Explore interactive taste test resources to encourage participants to try what you made!
[Taste-Testing Event Resources](#)



Milking parlor, credit: OSPI



Yogurt and Microorganisms

Learn It

Grades 6th–12th

Overview

- Making yogurt is a tasty and interactive way to learn about helpful microorganisms in the food supply. This demonstration lesson with lecture, uses powdered milk and requires no cooking. It's perfect for a classroom.

Materials

- 2 1/3 cups of instant, whole, unflavored powdered milk
- 4 cups hot tap water (110-120 degrees F)
- 1/4 cup room temperature plain yogurt (use yogurt with active cultures and no additives)
- Whisk
- Mixing bowl
- 2 quart size glass jars with lids
- Insulated cooler
- Meat thermometer
- Additional containers with lids such as half gallon milk containers.

Directions

Part 1: What is Yogurt?

Begin by asking students if they can describe yogurt. Allow two to three students to respond, then relay the following information:

- Yogurt, or yoghurt, is the most popular fermented milk product in the world. It is made by fermenting milk using bacteria cultures. When the lactose in the milk is fermented using these bacteria, it produces lactic acid, which in turn acts on milk protein to give yogurt its thicker texture and characteristic tangy taste.
- The benefit of having a fermented milk product is that few other potentially harmful microorganisms can grow in yogurt's acidic environment, so yogurt can be stored safely longer than fresh milk. Worldwide cow's milk is most commonly used to make yogurt, but it can be made from the milk of water buffalo, goats, sheep, horses, camels and yaks.
- Once the bacteria are added to the warm milk, they start to consume the milk sugars and begin fermentation, much like yeast in bread. Yogurt made with these active bacterial cultures produces lactase, the enzyme that allows humans to digest lactose. Consequently, yogurt can often be tolerated by people who are lactose intolerant. More information about the fermentation process of yogurt can be found on page 2 of this [lesson plan](#).





Yogurt and Microorganisms

Learn It

Directions

Part 2: Yogurt History

Ask students if they'd like to guess for how long humans have been eating yogurt. Allow several students to make guesses.

Explain that cultured milk products have been eaten since 2,000 BC. Yogurt is thought to have developed in Central Asia and was probably fermented spontaneously, likely by bacteria residing inside goatskin bags. People discovered when milk was left in a warm place, it thickened and developed a tart flavor. More historical information can be found on page 2 of this [lesson plan](#).

Part 3: Making Yogurt

1. Prep the insulated cooler which will become the incubator for this demonstration. To do this, pre-warm the incubator by filling it with containers of very hot tap water. Leave enough space for the two jars of yogurt mix. Show students how you made the incubation unit and explain how it will hold the heat while the milk and microbes work to make yogurt. Use a meat thermometer to check the temperature of the incubator prior to loading the yogurt mix. It should be 100–115 degrees F.
 - a. Important: Time and temperature are major factors in successfully making yogurt and keeping the microbes healthy. Handle the yogurt with care. It will not thicken properly if it cools or is shaken during incubation.
2. Show students the yogurt ingredients. Then add the powdered milk and hot tap water (110–120 degrees F) into a deep mixing bowl. Whisk it until fully dissolved. Measure the water temperature with the thermometer. Next, add $\frac{1}{4}$ cup of plain yogurt with active cultures and mix until well blended. Work quickly so the mixture does not cool.
3. Pour the mixture into the quart sized jars, cover with lids, place in the incubator, and close the lid. Let it sit undisturbed for 6 – 8 hours. During incubation the bacteria multiplies, ingests the milk sugar (lactose), thickens the milk and turns it into yogurt.





Yogurt and Microorganisms

Learn It

Directions

4. After incubation the yogurt will have set up. Refrigerate it until the next class. During next class, show students the finished yogurt and have them compare commercial plain yogurt and what the class made. Record findings (sweet, bitter, lumpy, smooth, etc.).
5. Expand this lesson by further exploring fermented foods and the role of microbes and fermentation the food supply.

Lesson adapted from [Oregon Agriculture in the Classroom](#).



Eat It

Yogurt and cheese, like other dairy products, provide essential nutrients like potassium, B vitamins, iodine, and protein, and calcium. Calcium is necessary to maintain healthy bones and to carry out other body functions. Yogurt and cheese are often fortified with vitamin D, which promotes calcium absorption and bone growth. Not many foods contain vitamin D, but our bodies produce it naturally with the help of sunlight. Yogurt also contains probiotics, which are live microorganisms known to support healthy digestion.

Some individuals are lactose intolerant. This means they do not produce enough lactase, a digestive enzyme used to break down the milk sugar called lactose. Individuals with lactose intolerance can try alternatives such as fortified lactose-free yogurt or cheese.



Cow, credit: OSPI

Read It

- Makin' Cows Smile, by Discover Dairy
- My Field Trip to a Wisconsin Dairy Farm, by Dairy Farmers of Wisconsin
- From Milk to Cheese (Who Made My Lunch?), by Bridget Heos and Stephanie Fizer Coleman
- Off to the Yogurt Factory, by Precious Mckenzie

More About It

- STEM lesson for grade 6-8 [Fuel-Your-Game-Day-Lesson-4-The-Science-of-Yogurt.pdf](#)
- Lessons and Activities from lesson plans from the Dairy Farmers of Washington:
 - Early learners: [Dairy Tales Coloring Book](#)
 - Early learners: [How We Get Our Milk Coloring Book](#)
 - Grade K-5th: [Dairy Lesson Plans](#)
 - Grade K-5th: [What Do Cows Eat?](#)
 - Grade 6th-8th: [Virtual Field Trip Lesson Plan](#)
- Lessons from Washington Agriculture in the Classroom:
 - Grade K-2nd: [It's a MOO-stery!](#)
 - Grade 3rd-5th: [Energy's Journey from Farm to You](#)
 - Grade 6th-8th: [From Cow to Carton: Milk's Journey to the Consumer](#)
 - Grade 9th-12th: [Milk: The Scoop on Chemical and Physical Changes](#)
- Video for all ages: [Modern Technology: Focusing on Cow Comfort](#)