

curd SCIENCE

**The Incredible Journey
from Milk to Curd**

*as told by
Violet Anderson,
Kid Scientist
Extraordinaire*

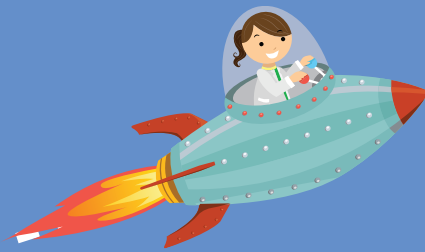


Brought to you by the Dairy Farm Families of Wisconsin

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That's me, Violet.

I've always been curious. Which I guess is good, seeing as I'm a kid scientist and all.

The state of Wisconsin is known all over the world for dairy. This reputation grows ever larger as Wisconsin's dairy farmers continue to produce pure, delicious milk, allowing our cheesemakers to craft some of the finest cheeses in the world.

This book is dedicated to those dairy farmers and cheesemakers who work hard every day to make this possible.



THE Mission

One day at school, Mrs. Hannigan told us we'd be learning about how cheese is made. Me being naturally curious, (not to mention, a big fan of cheese!)...well, I just couldn't wait to dive in.



SAY Mooooo

Everyone knows that all great cheese stories begin on Wisconsin dairy farms. That's because Wisconsin cheese is made from one of the best things on earth: Wisconsin milk.

Dairy cows get milked by machines at least two times a day. (And from what I hear, they like it!). The milk goes straight from the cow, through a pipe and into a cooler where it's kept until it can be delivered to the cheese factory. Amazing, isn't it?

Did You Know?
In five minutes, one cow can give about four gallons of milk. That's enough to supply 64 students with a carton for lunch!



STEP 1 Milk

Every day, a tanker truck like this one pulls up to the milking center. After the driver tests a sample for quality, the milk is pumped into the tank and hauled to the cheese factory.

Once the truck arrives at the factory, the milk is pumped into large silos, where computers check it for weight, temperature and **capacity**.

Did You Know?
It takes 10 pounds (!) of milk to make one pound of cheese.



Curd's the Word!
CAPACITY • [n. kuh-pas-i-tee]
The amount something can hold; volume.

The Science Behind the Science

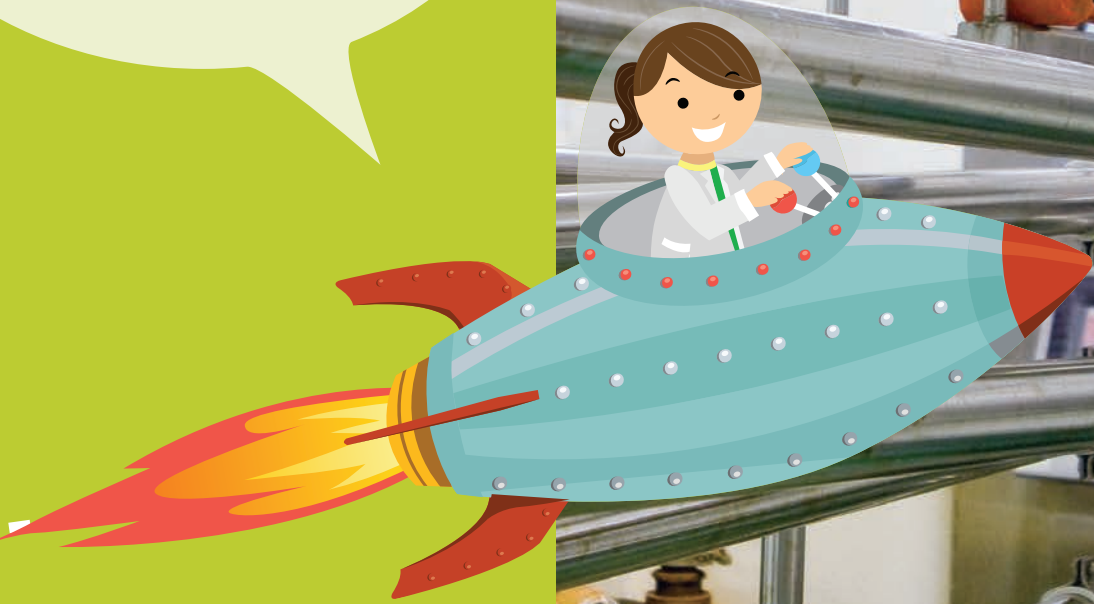
COMPUTERS check the weight, temperature and capacity of the milk being stored in the silos.




STEP 2 Standardize

Many milk trucks deliver fresh Wisconsin milk to cheese factories. All of this milk needs to be pasteurized. This means it gets heated to 165°F. Then it is tested for fat and protein, which are the parts of milk needed to make cheese. The fat and protein are then adjusted to **standardize** the milk in order to make yummy Wisconsin cheese.

Did You Know?
Cheese is full of calcium to help keep teeth and bones strong. And protein, too, for strong muscles!



 **Curd's the Word!**
STANDARDIZE • [v. stan-der-dahyz]
To make something the same.



The Science Behind the Science

LAB EQUIPMENT is used to test the milk for fat and protein.

A close-up photograph showing a person's hand using a white pipette to dispense a small amount of liquid into a white bowl. The bowl already contains a small amount of pink liquid. The background is a plain white surface.

STEP 3 Coagulate

Next, the milk is pumped into a stainless steel vat. Wisconsin cheesemakers then add starter cultures, or good bacteria, to start making cheese.

Did You Know?
Good bacteria is important because it can help you digest your food and keep you healthy.

This good bacteria helps give the cheese flavor and texture. The cheesemaker then adds an enzyme, called rennet to the milk, which helps the milk **coagulate**, turning it into a yogurt-like substance.



Curd's the Word!

COAGULATE •
[v. koh-ag-yuh-leyt]
To change a liquid into a solid.



The Science Behind the Science
BIOTECHNOLOGY, or living technology, is what's used in starter cultures to help milk start becoming cheese.

STEP 4 Cut

Now it's time to start cutting! This begins the process of separating the liquid, called **whey**, from the milk solids, called curds.

DID YOU KNOW?
There are more than 600 different varieties, types and styles of cheese made in Wisconsin.



Curd's the Word!
WHEY • [n. hwey]
The watery part of milk that separates from the solid curds during the cheesemaking process.



The Science Behind the Science
STRAINERS look like nets or fences and are used to separate the solid curd from the liquid whey.

STEP 5 Stir, Heat & Drain

Cheesemakers continue to cook and stir the curds and whey until it's as firm (or soft!) as they want it. The curds are then pushed to one end of the vat as the whey is drained away. This leaves tightly formed curds.

Did You Know?

Whey may be drained, but is not forgotten. In fact, whey can be used to make hand lotion, baby formula, chocolate candy—even animal feed!



The Science Behind the Science

STAINLESS STEEL RAKES and **MECHANICAL PADDLES** are used by cheesemakers to squeeze, stir and push the curds as they are cooked and heated. This helps remove the whey.



STEP 6 Transform

Depending on the kind of cheese being made, the cheesemaker then blends, mixes and forms heaps of curds using good, old-fashioned muscle! This part is called **cheddaring**. Next, the piles of curds are chopped and salted to give the cheese extra flavor.



Did You Know?
Salt also helps the liquid whey separate from the curd.



Curd's the Word!

CHEDDARING •
[n. ched-er-ing]
The flipping and turning of the heaps of curds to squeeze out remaining whey.



The Science Behind the Science
The mass of curds gets mashed up and cut into chunks of cheese curds by **CURD MILLING MACHINES**.

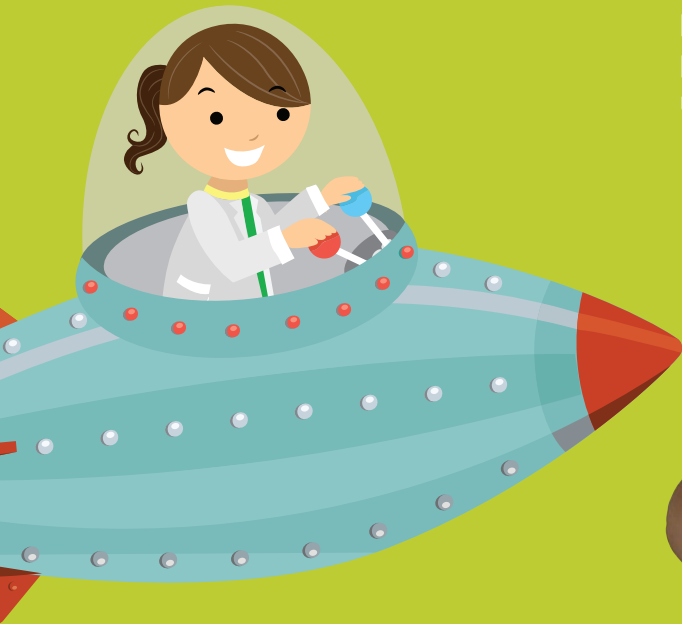


STEP 7 Press

Ever wonder how cheese gets made into different shapes? By pressing it, of course! Most Wisconsin cheese is pressed anywhere between 3 to 12 hours, depending on its size.

Did You Know?

Wisconsin cheese comes in all kinds of shapes, such as rounds, wedges, logs, squares, cylinders and more.



The Science Behind the Science

MECHANICAL PRESSING MACHINES help shape the cheese into blocks, as well as squeeze out any remaining whey.



STEP 8 Cure

Some of the cheese then needs to sit and age, or **cure**. The cheese is cured in a room that is checked by a computer for humidity and temperature until it is ready to be packaged. During this process, Wisconsin cheesemakers check on the cheese every day.



Did You Know?

In some cases, Wisconsin cheese may be aged for 10 years or more. Some are even aged for up to 20!



Curd's the Word!

CURE • [v. kyoo r]
The method by which cheese is aged or treated to give it a certain flavor.



The Science Behind the Science

REFRIGERATED ROOMS are controlled by **COMPUTERS** that check temperature and humidity to be sure that Wisconsin cheese can cure.



Time for some Wisconsin cheese!

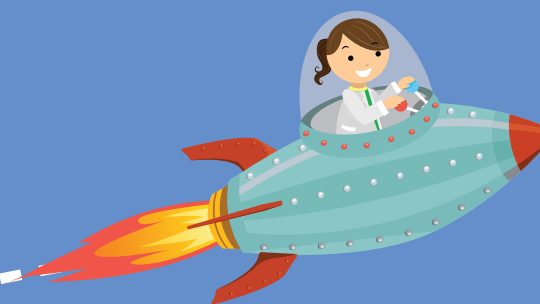
And there you have it.

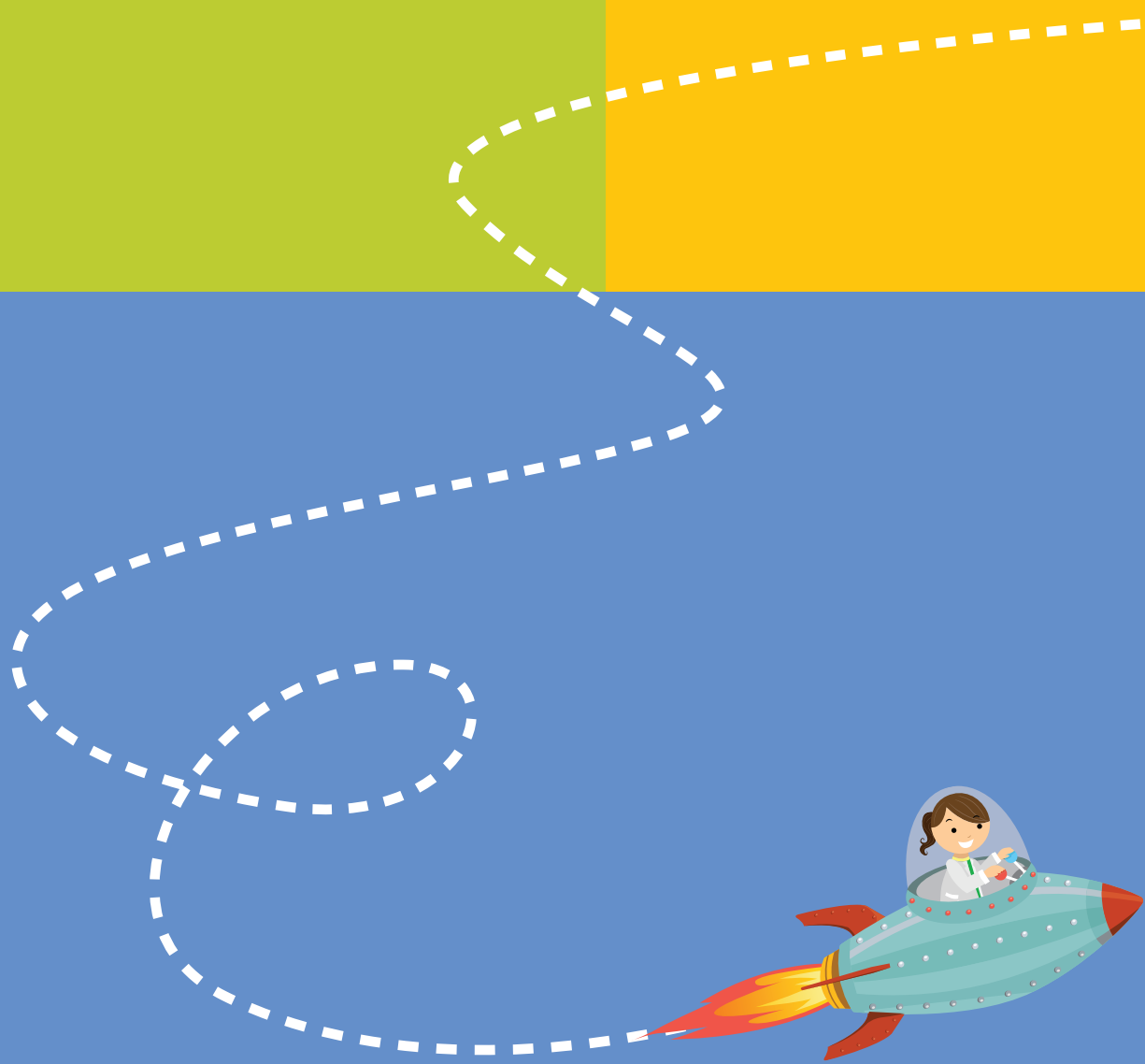
Wow, who knew something as delicious and good for you as cheese could have this much **science** behind it? As a kid scientist, my thirst for knowledge has definitely been quenched. Now, it's time to do something about my hunger. 😊

Science = Yum!



The End.





WisconsinDairy.org

