Ag Science 1 · Unit 6 · Level 2 (modified)

Dairy



TODAY'S PLAN

- 🐄 Dairy cows + breeds
- 🥛 What is in milk
- 🚚 Farm to plant
- 🔥 Pasteurize + homogenize
- 🧀 Dairy products

Words to Know

Words to Know



Dairy cow

A cow raised to give milk. Most U.S. milk comes from cows.



Holstein

The black-and-white breed; about 80% of registered U.S. dairy cattle. Gives the most milk.



Jersey

A small brown breed. Its milk is high in fat (creamy).



Milking parlor

The barn room where cows are milked by machines.

Words to Know

More Words to Know



🚚 **Milk truck**: The tank truck that hauls milk from the farm to the plant, kept under 40°F.

🔥 **Pasteurize**: Heat milk to destroy harmful bacteria (pathogens). It does not sterilize milk, so keep it cold.

🦴 **Calcium**: A mineral in milk that builds strong bones and teeth.

🍼 **Colostrum**: The first milk after a calf is born. It has antibodies that protect the calf.

Learn

Dairy in Washington

🥛 Milk and dairy products are Washington's **#2** farm product.

🍎 Apples are #1. Milk was about **$1.2 billion** in 2017.

🐄 About **9.3 million** dairy cows in the U.S.



Learn

More Milk From Fewer Cows



📉 In 50 years the **number** of dairy cows went **down** more than 50%.

📈 Milk **per cow** went **up** more than 130%.

🏅 Washington, California, and New Mexico are top states for milk per cow.

Learn

Major Dairy Breeds

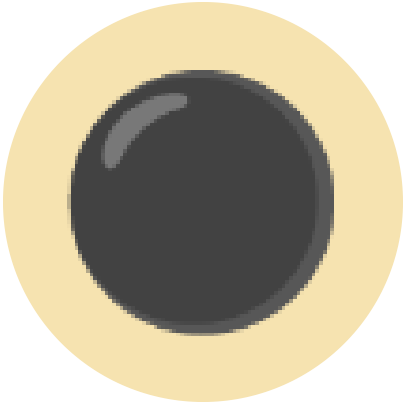
⚫ **Holstein**: black and white, about 80% of registered cattle, the most milk.

🟤 **Jersey**: small and brown, high-fat milk.

🟫 Also Guernsey, Brown Swiss, Ayrshire, Red and White, Milking Shorthorn.



🃏 Check 1 of 3



About 80% of registered dairy cattle are…

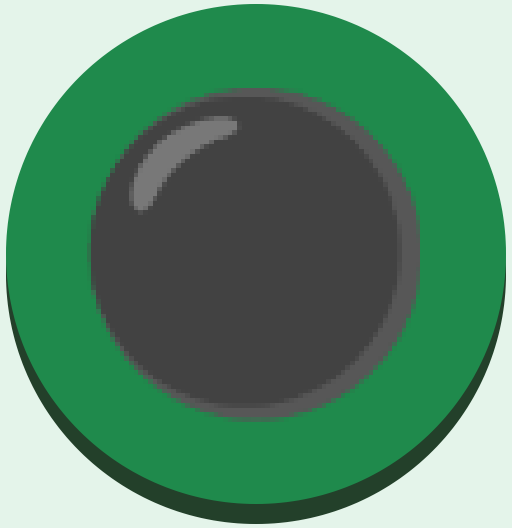
Hold up 1, 2, or 3:

1️⃣ Jerseys

2️⃣ Holsteins

3️⃣ Ayrshires

✅ Answer · Card 1 of 3



Holsteins

Holsteins make up about 80%.

Learn

What Is in Milk?



💧 Milk is about **87% water**.

🧈 Fat, 🥩 protein (casein), 🍬 lactose (milk sugar), 🪨 minerals.

🦴 3 key nutrients: **protein**, **calcium**, riboflavin.

Learn

Milk Let-Down

🖐 Touching the teat sends a signal to the **brain**.

🧪 The brain releases **oxytocin**, which pushes milk out.

😟 Pain, loud noise, or stress can **block** it. Calm cows give more milk.



🃏 Check 2 of 3



What can block milk let-down?

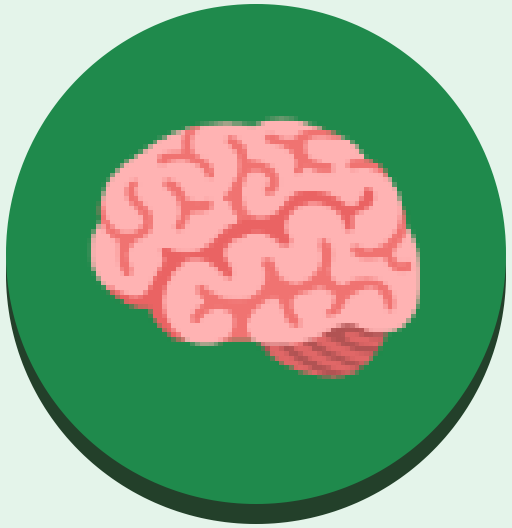
Hold up 1, 2, or 3:

1️⃣ Clean water

2️⃣ Soft bedding

3️⃣ Stress and loud noises

✅ Answer · Card 2 of 3



Stress and loud noises

Cows should be calm and comfortable in the parlor.

Learn

Farm to Plant

🌡️ The driver checks milk is **under 40°F**.

👃 Checks smell and looks for dirt.

🧪 Takes a **sample** to test for bacteria, fat, and antibiotics.



Compare

Two Big Steps at the Plant



Pasteurize

🔥

Heat kills harmful bacteria
Most common: 161°F for 15 sec (HTST)
Still needs the fridge

Homogenize

🌀

Breaks up fat globules
No cream layer on top
Vitamin D added to all milk

🃏 Check 3 of 3



Pasteurizing milk…

Hold up 1, 2, or 3:

1️⃣ Kills harmful bacteria with heat

2️⃣ Makes milk last forever

3️⃣ Removes the fat

✅ Answer · Card 3 of 3



Kills harmful bacteria with heat

It does not sterilize milk, so it must stay cold.

Learn

Dairy Products



Cheese
casein clumps



Yogurt
probiotics



Butter
from cream



Ice cream
≥10% fat

Learn

Shelf Life



🧊 Keep milk **below 40°F**.

🌡️ Warmer milk spoils much faster.

📅 The “sell by” (pull) date is the last day the store can sell it.

Learn

Calves and Colostrum



🍼 **Colostrum** = the first milk after birth.

🛡️ It has **antibodies** (immunoglobulins).

⏰ Calves need it soon after birth.

Wrap-Up

Recap



Breeds

Holstein, Jersey, more



Milk

87% water, protein, calcium



Plant

pasteurize + homogenize



Products

cheese, yogurt, butter, ice cream

Wrap-Up

Exit Ticket



1️⃣ Name 2 dairy breeds.

2️⃣ Why is milk pasteurized?

3️⃣ Name 2 dairy products and what makes one special.