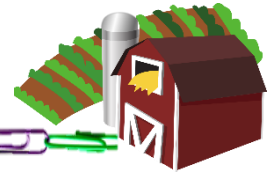




Links to Agriculture Glue from Milk



The History of Elmer's Glue

Many years ago, Gail Borden, Jr., the founder of the Borden Company saw several children get very sick and pass away on board a ship after drinking contaminated milk. At this time spoiled milk was common because no one knew how to keep milk fresh. After much experimentation, Borden discovered that "condensing milk" (heating milk so that much of the water content is removed) would keep the milk from spoiling. The heating killed any bacteria present in the milk. The Borden Company produced condensed milk as well as a variety of other milk products. In 1861 the U.S. government ordered 500 pounds of condensed milk from the Borden Company for troops fighting in the Civil War.



By the late 1930's, Elsie the Cow had become Borden's popular "spokes-cow". She was a big hit at the 1939 New York World's Fair, and soon afterwards the character of Elmer the Bull was created as Elsie's husband.

A dairy company going into the adhesive business may seem surprising, but it makes sense when you learn that one of the prime ingredients in this early form of the glue was casein, the protein in dairy milk. (Today's glue is made from synthetic materials.) By the late 1940's, Borden's new chemical division was making glue and asked to use Elsie for its new white glue product.

The thought of putting Elsie on a non-food product didn't seem appropriate, so as a compromise, Elmer the Bull was loaned to the chemical division as their very own "spokes-bull". Today, Elmer the Bull still represents the most recognized adhesive company.



Elmer's School Glue is still used in schools throughout the nation. The glue is popular because it is washable and comes in individual bottles. Borden has greatly expanded the product line over the years. The company makes specialty glues that work on different types of surfaces, like Krazy Glue. Some consumers appreciate buying Elmer's Glue as a glue stick. Glues are also manufactured in colors and with glitter to make them fun for different uses.

How Well Did You Read?



- The purpose of Gail Borden's original experiment was
 - a) to learn how to make glue sticks
 - b) to learn how to make glue
 - c) to keep children from getting sick from spoiled milk

- The product first made by the Borden Company was
 - a) cheese
 - b) condensed milk
 - c) glue

2. Why was this an important product for the Borden Company, especially Gail Borden, Jr. to make?

3. What did the first glues have in common with milk?

- a) synthetic materials
- b) protein
- c) bacteria

4. Why didn't Elsie's picture go on the glue logo?

- a) Elsie was already used for the milk products
- b) It didn't seem appropriate to use Elsie for a non-food product
- c) They didn't want a cow on their logo.

5. What part of this article did you find most interesting? Why?

Mooovin' Around with Milk

You have turned milk into glue. Now try this experiment and investigate another property of milk.



Materials:

- Food Coloring
- Liquid Dish Soap
- Shallow Pan/Dish
- Whole Milk (Room Temperature)



Directions:

- Pour some milk into the pan. Allow the milk to come to room temperature.
- Add a few drops of different colored food coloring into the pan of milk.
- Add a few drops of liquid dish soap into the pan of milk.
- Watch to see what happens.

How does it work?

The fat in the milk is broken down by the liquid soap. This causes the food coloring to swirl and make some interesting designs.

Try this:

- Use other kinds of milk –fat free, 1%, or 2%. Do you get the same results? Why or why not?
- Use milk at different temperatures. Does it make a difference?
- What different of designs can you create? Try different amounts of food coloring or try moving your detergent Q-tip in different ways.

Cow Trivia

- A cow has one stomach with four different compartments.
- In 1611, the first cow arrived in America. Today there are around 10,000,000 dairy cows in the United States.
- Modern milking machines can milk 100 cows an hour.
- Milk delivered to stores and schools today was in the cow two days ago!



Did You Know...?

- Milk cows usually have their ears pierced with identification tags. Each cow has a different number that allows the dairy farmer to track her activities by computer. The weight of the cow's milk is recorded in the computer as are any medicines she receives.
- You can tell one Holstein cow from another by their spots. Holstein's spots are like a fingerprint or a snowflake.
- No two cows have exactly the same pattern of spots.



Joke Time

1. What is a cow's favorite candy bar?
2. What did one bottle of glue say to another bottle of glue?



Joke Answer:

1. Milky Way
2. We need to stick together.



For more agricultural education lessons and resources, visit:
www.maefonline.com