



**Grade Level:** 1, 2, 8

**Indiana Academic Standards:**

Examples of select academic standards possibly met during this activity. Additional academic standards may be achieved with added enrichment activities.

**Physical Science:** 1.1; 2.1.2;

**Earth and Space Science:** 8.2.7; 8.2.8

**Time:** 30 minutes, plus set-up.

**Materials:**

- 1 tablespoon liquid starch
- 2 tablespoons white glue
- 3 drops food coloring, optional
- Plastic egg for storage
- Disposable bowl for mixing
- Measuring spoons

**Recommended Reading:**

- Corn Ag Mag*
- Corn Terra Nova Reader*
- Beef Ag Mag*
- Beef Terra Nova Reader*

# Moo Goo

**Description:** Students will create putty using basic ingredients.

**Objectives:**

- Describe environmental reasons for using plant and animal byproducts in the production of non-food items.
- Explain what a byproduct is.
- Observe changes in substances as they are combined.

**Background:**

What is a by-product? A by-product is a secondary or incidental product made from the manufacturing process and is not the primary product or service being produced. By-products serve as source materials for other industries, including pharmaceuticals, chemicals, and textiles.

**Activity Directions:**

1. Place 1 tablespoon liquid starch in a small disposable bowl.
2. Add glue and let set for 5 minutes.
3. Add food coloring, optional.
4. Mix until starch is absorbed and color is spread smoothly. The more you mix, the better it gets.

The resulting putty can be bounced, used to pick up pictures from comics and newspapers\*, and molded into shapes.

**Agricultural Connection:**

1. Starch is a byproduct of corn.
2. Glue contains animal byproducts.

**Observations:**

1. What do you notice about your putty?
2. Is your putty the same as other students' plastic?

**Tips:**

- \*Store in plastic egg overnight before using to pick up pictures from comics or newspapers.
- If left in open air, the putty will melt then turn hard.
- Add a teaspoon more starch for a tougher, more rubbery putty.
- Putty will last for several days if stored in an airtight container.
- If putty dries out or gets tough, dip into warm water and knead until soft.

**Take it Further**

- Have students research plant and animal byproducts and create a display.

# Everything But the Moooo.....

## By-Products from Cows

### From Brain...

- Anti-aging cream medicines

### From Blood...

- Pasta
- Cake mixes
- Dyes & inks
- Adhesives
- Minerals
- Medicines
- Laboratory research materials

### From Bones...

- Refined sugar
- Charcoal
- Fertilizer
- Glass

### From Hair...

- Air filters
- Brushes
- Felt
- Isulation
- Plaster
- Textiles

### From Manure...

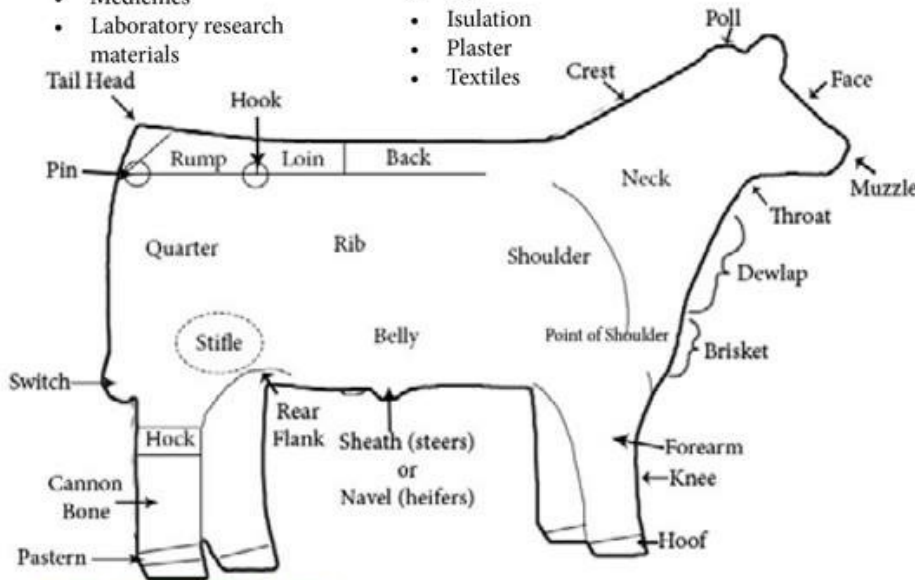
- Fertilizer
- Nitrogen
- Phosphorus

### From Internal Organs...

- Instrument strings
- Tennis racquet strings
- Hormones, enzymes, vitamins & other medical material

### From Fat...

- Chewing gum
- Candles
- Detergents
- Fabric softner
- Deodorant
- Shaving cream
- Perfume
- Pet food
- Cosmetics
- Creams & lotions
- Crayons
- Paint
- Oil & lubricants
- Biodiesel
- Plastics
- Waterproofing agents
- Cement
- Ceramics
- Chalk
- Explosives
- Fireworks
- Matches
- Fertilizer
- Antifreeze
- Insulation
- Linoleum
- Rubber
- Textiles
- Medicines



### From Hooves and Horns...

- Adhesives
- Plastics
- Pet food
- Plant food
- Photo film
- Shampoo & conditioner
- Emery boards
- Lamination
- Wallpaper
- Plywood

### From Milk...

- Adhesives
- Plastics
- Cosmetics
- Medicines

### From Skin...

- Gelatin
- Flavorings
- Emery boards
- Sheet rock
- Wallpaper
- Adhesives
- Medicines
- Candies & confectionary

so many products come from cows that we really do use everthing but the moo!



