



# Food Science/ Healthy Living:

Bonus Lesson

## Project: Protein – Egg Replacer

### Supplies:

- 1/8 cup butter
- 1/4 cup egg substitute
- 2 eggs
- 1/6 cup milk
- 1 cup sugar
- 1/2 tsp. vanilla
- 1/2 cup cake flour
- 1/2 tsp. baking powder
- Muffin tins
- Muffin/cupcake papers

**Time: 1 hour**

### What to Do:

1. Preheat the oven to 350°F.
2. Sift together the flour, salt, and baking powder and set the mixture aside.
3. Use an electric mixer to combine the shortening, sugar, and vanilla.
4. Add either the egg replacer or the eggs to the wet mixture (shortening, sugar, vanilla) and beat for 1 minute after each addition.
5. Add half the flour mixture and half the milk and beat at medium speed for 1 minute. The last portion of the flour and liquid is added and blended together for 30 seconds at medium speed and then for 3 more minutes at high speed.
6. Pour equal portions of the batter into the paper cupcake holders. Make sure each cupcake holder is labeled as either “control” or “experiment”.
7. Repeat the above steps to make the other batter (egg or egg replacer).
8. Bake for 25 minutes at 350°F. After baking, cool for 5 minutes before removing from the muffin tins. Compare the samples and record your observations in Table 1.

### Reflect:

Score each product using a 9-point hedonic scale:

1	2	3	4	5	6	7	8	9
like extremely	like very much	like moderately	like slightly	neither like nor dislike	dislike slightly	dislike moderately	dislike very much	dislike extremely

Table 1. Comparison of Baked Good with Egg vs. Egg Replacer

	Appearance	Texture	Volume	Tenderness	Flavor
Egg					
Egg Replacer					

**Reflect (cont.)**

1. How did the muffin batter and the finished muffins compare in the egg recipe vs. the egg substitute recipe?
2. Can you tell a difference in appearance, texture, volume, tenderness, or flavor of the two samples?
3. Why would somebody or a food company replace egg with an egg substitute in a recipe?

**Apply:**

In bakery items, eggs impart their unique ability to foam, emulsify, and coagulate when exposed to heat. Because of these properties, eggs play an enormous role in producing the flavor and texture of the final product. It can be a challenge to find a comparable alternative/substitute, but it may sometimes be necessary. Even though eggs contribute many positive attributes to a recipe, they are not always an option for everyone.

Raw eggs can pose a dangerous health risk to babies, elderly people, pregnant women, and anyone who has a poor immune system or is already sick. There are also some individuals who choose not to eat ingredients that come from animals like eggs, milk, or meat for personal or religious reasons. So while eggs can help with the appearance, texture, structure, and flavor of a baked food item, egg replacers can provide a similar effect without causing a health risk and making the food consumable to everyone.

**Background:**

Egg replacers replicate the binding, emulsifying or leavening properties of chicken eggs. Egg replacer recipes utilize complex sugars, seed gels, starches, gums, sugars or other hydrocolloids to replace eggs when necessary. Examples of egg replacers include commercial products, ground flax seed, silken tofu, baking soda and vinegar, and even bananas!

Source: [www.thekitchn.com](http://www.thekitchn.com)