



Egg Replacement

Reduce cost and keep functionality

What is the function of eggs in baking?

Eggs consists of two parts: egg whites which are mostly water (90%) and proteins such as albumins, mucoproteins, and globulins, and the yolk which is composed of high lipids (fats) and lipoproteins.

The functions of eggs in bakery goods include:^{1,2}

- Emulsifying: natural emulsifiers in the egg yolk
- Gel forming: the coagulation of egg produces a gel
- Binding: brings together and helps hold the batter system together
- Aeration: produces foams that are essential for volume
- Sensory: contributes to color, flavor, appearance, texture and quality of bakery goods
- Wetting agent: eggs provide moisture to dough or cake batter

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Why replace eggs in baked goods?

There are ever growing reasons to find egg replacements in a bakery setting. One aspect is savings: while egg prices rise and fluctuate, many egg replacers can come at half the cost. A few other reasons:

- Supply chain issues
- Egg allergy
- Vegetarian / [vegan baking](#)



How to replace eggs based on function

Eggs work as thickeners and binders in baking. In bakery goods, egg white proteins are responsible for good foaming capacity, stabilization, elasticity, etc.³ Egg yolks are mainly responsible for emulsification. Here are replacement suggestions:

1 PROTEIN

Isolated protein from chickpea, beans, peas, lentils and lupins have been reported to have fat binding, water holding capacity, solubility, gelling, foaming, and emulsifying properties. Whey protein is a well-known gelling agent and contributes to emulsification in the bakery system.⁴ [Wheat gluten](#) plays an important role in the bakery goods for holding the structure. It will help the dough rise by trapping gas bubbles during fermentation and provide the unique texture for the final bakery goods.

Dairy proteins are also known to provide the building function in dough and batter systems. They are classified into whey proteins and milk proteins.⁵ [Whey protein](#) can function as the building agent in the dough system for holding structure.



Cont.

2 OTHER REPLACEMENTS

- **Hydrocolloids or gums:** improves the viscosity of the product, therefore entrapping more air. This results in an improved volume.⁷
- **Fiber:** usually contains fibrous composition for entrapping water and oil droplets. So, fiber could provide water-binding capacity and emulsification property. Some fibers such as citrus or maple can provide mouthfeel for textural purpose.

How to replace eggs in a sponge cake formula

The functions of eggs in sponge cake include water-binding, aeration, creating structure and stability of cake batter, thickening and emulsifying. For replacing eggs in a sponge cake, ingredients with the same functions are needed.

Structure creation and stability: Proteins
Water binding: Hydrocolloids and proteins
Emulsifying: Proteins and fiber
Leavening: Chemical leavening agents



“ My egg-free cake remains uncooked, even at proper bake times and temperature

Increase baking temperature and time and target a thermal profile reading of 20% arrival. Eggs contain egg white (mainly water) and egg yolk. Whey protein concentration should be added in at a level that has the same total solids of replaced eggs, and replace the remaining amount with water.

“ Can I make gluten-free bread without eggs?

Most definitely, yes. In gluten-free loaf bread, eggs are natural leaveners that provide the volume. In addition, eggs can also add moisture, flavor, and protein to gluten-free bread for structure. If your [gluten-free bread](#) is for the vegan market, try a combination of maple/citrus fiber and hydrocolloids and aqua faba. If it has dairy in it already, try using a whey protein concentrate, which is one of the cheapest alternatives available.

“ What can I do to make brioche buns more tender if we remove eggs?

Eggs in [brioche buns](#) are important for water-binding, emulsifying, creating structure and texture, and color formation. Removing them results in a softer bread, mainly due to the loss of function for creating structure and texture. You can use a protein to replace these functions. And since the brioche already has dairy in it, looking at a whey protein concentrate would make sense.



References

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