

FOOD FUN

4 - H W Y O M I N G

SUNDAY BRUNCH OR BREAKFAST ON THE GO: WHAT IS A LEAVENING IN BAKING?



To get the best rise out of your baked goods it's important to understand the different types of leavening agents. Learn about the four main types of leaveners – chemical, biological, mechanical and physical – and how they work to make baked goods rise.

A leavening agent is a substance that causes dough to expand by releasing gas once mixed with liquid, acid or heat. Rising agents give baked goods optimal volume, texture and crumb and can include baking soda or baking powder, whipped egg whites or cream, active or instant dry yeast, and even steam.

How to Leaven Breads, Cakes, Cookies and Baked Goods

Leavening adds volume to your baked goods, whether you're baking bread, cake or cookies. The trapped air that is formed by the leavening process creates a more tender and open crumb in your breads and cakes and provides a more pleasant texture and mouthfeel. Without leavening, your desserts and breads will not rise and the product will be too dense.

This guide outlines the four main types of leavening agents and describes how each has its own purpose. Using the correct leavening agent will help deliver the most desirable results for the type of baked goods you are making. Your recipes will call for the agents that

work best for baking, or bread dough that requires kneading and a long, slow fermenting and rising time.

What is a Natural Leavening Agent or Naturally Leavened Bread?

A natural leavening agent is a yeast substance that produces fermentation in bread dough or batter, making the dough rise. Naturally leavened bread is easily achieved by letting flour and water ferment. The most common types of natural leaveners include chemical, biological, physical and mechanical.

What are Chemical Leaveners?

A chemical leavener is a compound or a mixture that is added to dough or batter and releases gases when it reacts with moisture or heat.

How Chemical Leaveners Work

When a chemical leavener such as baking soda is mixed with an acidic liquid such as buttermilk, yogurt, honey, or lemon juice it reacts quickly, expanding and creating volume in the dough. The word chemical simply describes the process of combining ingredients to produce a reaction, as in chemistry, and has nothing to do with harmful substances. Without chemical leavening, we wouldn't be able to enjoy cookies, cakes and quick breads.



List of Chemical Leavening Agents

Here are the most commonly used chemical leavening agents that you might find by themselves or combined in recipes for cakes, cookies and quick breads.

- **Baking soda** is also called bicarbonate of soda or sodium bicarbonate. When combined with an acid, carbon dioxide gas forms, producing bubbles that make the dough or batter rise.
- **Baking powder** is a dry mixture made of a base of carbonate or bicarbonate and a weak acid. It is used to increase the volume and lighten the texture of baked goods.
 - **Single-acting** baking powder reacts when hydrated and does not need heat to react.
 - **Double-acting** baking powder reacts when hydrated and reacts again when heat is introduced.
- **Bakers ammonia** is also called ammonium carbonate; it makes baked goods such as low moisture cookies and crackers light and crisp.

Substitution Tip:

If you don't have baking soda on hand, you can use baking powder instead. Be sure to double or triple the amount of baking powder because it is a mix of baking soda and cream of tartar, and contains less baking soda. Keep in mind that tripling baking powder may affect the taste of baked goods.

If you don't have baking powder on hand, make your own using one part baking soda and two parts cream of tartar. Remember, homemade baking powder acts and tastes much like commercial baking powder.

When to Use Chemical Leaveners in Baking

Chemical leaveners are what make quick breads like banana bread rise quickly as it bakes and gives it a delicate, tender crumb. They also dictate whether a cookie is soft, chewy or crispy and they can help create the lightest, fluffiest buttermilk biscuits. It's important to follow a recipe precisely, as adding too much of a chemical leavener can cause the dough or batter to over rise and leave a bitter taste.

Baked goods that require chemical leaveners include:

- Cake
- Coffee Cake
- Cookies
- Muffins
- Brownies
- Dessert Bars
- Biscuits
- Corn Bread
- Doughnuts
- Pancakes & Waffles

What are Biological Leavening Agents?

A biological leavener is a substance called yeast that makes baked products lighter by helping them rise.

How Biological Leaveners Work

Yeast is a one-celled fungus that activates the fermentation that converts sugar and starch into the carbon dioxide bubbles and alcohol that are necessary for bread dough to rise.

List of Biological Leavening Agents

There are a number of biological leavening agents that are used in baking to make dough and batter rise, including:

- **Active Dry Yeast:** this dry, granular yeast is the most commonly used. It must be activated or proofed by dissolving it in warm water, ideally heated to 105°F.
- **Instant Dry Yeast:** a dry, granular yeast that can be mixed directly in with your flour and does not require proofing. Use $\frac{1}{3}$ to $\frac{1}{2}$ less than active dry yeast.
- **Fresh Yeast:** also called cake yeast is most commonly used in professional bakeries. It can be mixed directly into dry ingredients or dissolved in water to more evenly disperse it, but does not need to be proofed first.
- **Yeast Conversions:** to use active dry yeast instead of instant yeast in a recipe, multiply the amount of yeast in the recipe by 1.25. To use active dry yeast instead of fresh yeast, multiply the fresh quantity by 0.4. To use instant dry yeast instead of fresh yeast, multiply the fresh quantity by 0.33.
- **Beer:** has carbon dioxide in it and is used as a wet ingredient to leaven beer bread.
- **Fermented dough starter:** a live culture made of flour and water that once mixed begins to ferment, cultivating the naturally occurring wild yeasts and bacteria present within the mixture. A small portion of this culture is used to make your bread dough rise.

When to Use Biological Leaveners in Baking

A biological leavener is best for recipes such as yeasted cakes and yeasted bread doughs such as sourdough, that require a slow ferment in order to rise. Yeast helps dough rise over time and develops the desired volume and flavor of the finished product.

Baked goods that require a biological leavener include:

- Bagels
- Soft Pretzels
- English Muffins
- Bread Sticks
- Pizza
- Naan
- Flatbread
- Focaccia
- Injera
- Buns
- Cinnamon Rolls



What are Biological Leavening Agents?

Mechanical leavening agents are ingredients that are mechanically manipulated to create tiny air bubbles and help baked goods rise by releasing the gas that's trapped in the product.

How Mechanical Leaveners Work

This form of leavening uses ingredients that are mixed by hand with a whisk or using a hand mixer, stand mixer or an immersion blender. You can cream fat and sugar, whip egg whites or whip heavy cream to create mechanical leavening in a recipe. When baked, the air within the dough or batter expands and the egg whites or fat stretches and then the dough sets in the expanded state.

List of Mechanical Leavening Agents

There are a number of mechanical leavening agents that are used in baking to make dough and batter rise, including:

- **Whipped cream:** whipping heavy cream traps air between thin layers of cream fat in a foam-like substance that expands and holds shape in baking.
- **Whipped egg whites:** whisked or beaten at a very rapid pace so air bubbles become trapped in the soft or stiff peaks and provide most of the finished baked good's structure.
- **Whipped whole eggs:** often used in cake recipes will make the final product more dense than using only egg whites.
- **Whipped aqua faba:** the liquid from canned or cooked chickpeas or other legumes can be whipped and used as an egg white replacement.
- **Whipped fats or creamed butter and sugar:** cutting sugar crystals into fat produces air bubbles that cause a slight rise during baking. Most cookie recipes combine creamed butter and sugar with a chemical leavener to boost the rise.
- **Kneading:** adds air into dough through repeated folding and rolling, which forms the network of gluten strands that make the dough rise.

When to Use Biological Leaveners in Baking

Mechanical leaveners are used to create light, fluffy baked goods such as a soufflé that needs to rise a lot and hold its form when baked. They're also important in many other types of baked goods and unbaked desserts, including:

- Sponge Cake
- Angel Food Cake
- Chiffon Cake
- Mousse
- Frosting
- Meringue
- Biscuits
- Cookies
- Marshmallows

What are Physical Leavening Agents?

The most commonly used physical leavening agent is the steam that forms in moist batter or layers of dough when it is introduced to high baking temperatures. The heat causes the water to convert to steam, which makes the product increase in volume up to as much as 1500 times its unbaked size.

How Physical Leaveners Work

When the moist dough or batter is heated at a high temperature, the liquid quickly transforms into steam that becomes trapped inside the layers of dough or the batter, which solidifies during baking, producing flaky, delicate layers. Air is another type of physical leavening created with a machine or a tool. This is sometimes referred to as mechanical leavening.

Specialty appliances made for steam baking let you introduce additional moisture into a dry convection baking environment to help you produce crusty bread, creamy and smooth custards, and flaky pastries with delicate layers.

List of Physical Leavening Agents

There are a several ways to easily introduce steam in your baking, including:

- **Steam oven:** an oven that has a built-in mechanical function or an attachment that creates controlled steam injection.
- **Pan of water:** set a sheet pan or cake pan on the bottom of the oven to preheat with the oven. Pour hot water into the pan after you place the dough on the rack, then close the door quickly.
- **Dome:** enhance the pan of water method by placing a large metal mixing bowl over your loaf of bread to trap the steam.
- **Dutch oven or cloche:** place the dough in a preheated heavy pan with a tight fitting lid to bake. The pan traps and enhances the steam created when the dough begins to rise. Remove the lid after 25 minutes to bake in a dry oven.
- **Bain marie or water bath:** a pan of hot water placed in the oven to hold the baking pan. This adds moisture to the oven and surrounds the baking pan with gentle, uniform heat, which is important for cheesecakes and custards which easily crack or become rubbery.
- **Spray:** a simple way to add steam is to spritz your bread dough a few times with water as it enters the oven. You can repeat after a minute or two and also spritz the sides of the oven to create more steam.

Remember that steam is ideal during the spring stage of baking, or when the dough or batter is first beginning to rise. The rest of the baking time should be done in a dry oven because if you continue to add moisture, the texture can become rubbery.



When to Use Physical Leaveners in Baking

You'll use steam in your baking whenever you make cheesecake or custards to ensure the top doesn't form wide cracks from dry heat. Steam will also help you develop beautiful crusts on your favorite breads. Physical leavening with steam is an important method for many other types of baked goods, including:

- Choux Pastry
 - Cream Puffs
 - Eclairs
 - Profiteroles
- Puff pastry
 - Tarts
 - Appetizers
- Popovers
- Pie Crust
- Quiche
- Custard

Troubleshooting Bread or Cake Leavening

Sometimes baked goods just don't come out the way you planned and you can often trace the cause to the leavening. Some common leavening issues include:

- **Cake collapsed in the middle** - this is most often caused by too much baking soda, which reacts quickly in the oven, causing gas bubbles to rise to the top and then pop. You can help control this by weighing ingredients precisely, and by allowing mixed batter to sit for a few minutes to let some of the gas bubbles escape before putting it in the oven.
- **Cookies spread out** - to keep cookies from becoming puddles, you can add 2 more tablespoons of flour to the dough to help hold the melting fat. You can also roll cookie dough into balls and refrigerate or freeze them for ten minutes before baking to help control spreading.
- **Bread is dense and heavy** - there are several reasons why your bread might come out feeling like a brick. You may not have kneaded the dough long enough to form a uniform gluten strand mesh, which is what makes dough rise. Knead with a dough hook in your stand mixer until the dough appears soft, springy and forms a translucent rectangle when you stretch a small piece of it with your fingers. You may have mixed your yeast with salt, which kills yeast before it has a chance to activate the dough. Always mix salt in with flour after the yeast has activated. Finally, it's important to be patient and take the time to properly shape your loaves so they have enough surface tension to rise and hold their shape in the oven. Learn more about what causes bread proving issues in this article.

Even the most creative baking is at its heart a science. Once you have a clear understanding of how these leavening agents work to produce the ideal volume and texture, baking will be more fun and the results will be more delicious than ever.



Perfect Chocolate Waffles

TOTAL TIME: 30 minutes (Prep: 10 minutes, Cook: 28 minutes)

YIELD: 8 Servings

Perfect Chocolate Waffles are easy to make at home in about 30 minutes! These waffles are crisp on the outside, with a tender and rich chocolate inside!



INGREDIENTS

- 2 ¼ Cups All Purpose Flour
- ½ Cup Cocoa Powder
- ⅓ Cup Granulated Sugar
- 2 Teaspoons Baking Powder
- 1 Teaspoon Baking Soda
- ½ Teaspoon Cinnamon
- ½ Teaspoon Salt
- 2 Large Eggs, Separated
- ½ Cup Vegetable Oil
- 1 ½ Cups Milk
- ½ Cup Coffee** SEE NOTE
- 1 Teaspoon Vanilla Extract

NOTE

- You can also use milk in place of the coffee in this recipe.

DIRECTIONS

- 1.** Preheat your waffle iron, spray with nonstick cooking spray and set aside.
- 2.** In a large bowl whisk together the flour, cocoa powder, baking powder, baking soda, sugar, salt, and cinnamon.
- 3.** In a medium bowl beat the egg whites with a hand mixer until stiff peaks form. Set aside.
- 4.** In a separate medium bowl mix together the egg yolks, vegetable oil, milk, coffee if using, and vanilla extract.
- 5.** Add the egg yolk mixture to the dry ingredients and mix well.
- 6.** Fold in the egg whites.
- 7.** Pour the batter onto your hot waffle iron and cook according to manufacturer's directions**
- 8.** Serve immediately with butter, syrup, powdered sugar or any other favorite toppings.

Recipe source: www.thesaltymarshmallow.com



Perfectly Fluffy Pancakes



TOTAL TIME: 30 minutes (Prep: 15 minutes, Cook: 15 minutes)

YIELD: 12 Pancakes

The best pancake recipe to make from scratch. They are fluffy and so easy to make!



INGREDIENTS

- _ 2 cups all-purpose flour
- _ 2 tablespoons granulated sugar or to taste
- _ 4 teaspoons baking powder
- _ ½ teaspoon baking soda
- _ ¼ teaspoon salt
- _ 1 ¾ cups milk or as needed
- _ 2 large eggs
- _ 2 tablespoons melted butter or vegetable oil
- _ 1 teaspoon vanilla extract

NUTRITION FACTS

1 pancake, Calories: 129 | Carbohydrates: 21g | Protein: 4g
Fat: 3g | Saturated Fat: 2g | Cholesterol: 34mg | Sodium: 94mg
Potassium: 226mg | Fiber: 1g | Sugar: 4g | Vitamin A: 175IU
Calcium: 114mg | Iron: 1mg

DIRECTIONS

- 1.** In a medium bowl, whisk milk, eggs, melted butter, and vanilla.
- 2.** In a separate bowl, combine flour, sugar, baking powder, baking soda, and salt. Whisk to combine.
- 3.** Create a well in the center of the dry ingredients and add the wet mixture. Gently stir the batter until just combined, the batter should be slightly lumpy.
- 4.** Preheat a griddle or frying pan over medium heat (or to 350°F). Lightly grease with butter or vegetable oil.
- 5.** Pour about ¼ cup of batter onto the heated griddle for each pancake. Cook on one side until bubbles form and begin to pop, about 2 minutes. Flip the pancakes over and cook for an additional 1-2 minutes, or until both sides are golden brown.
- 6.** Transfer the cooked pancakes to a serving plate or a warmed oven and repeat with the remaining batter.

NOTES

- _ If you prefer a sweeter pancake, add a little bit more sugar.
- _ **To Make Large Batches:** If making large batches, preheat the oven to 175-200°F and keep a baking sheet in the oven. Keep pancakes warm on the baking sheet.
- _ **To Make Whole Wheat Pancakes:** Substitute 1/2 cup of white flour for whole wheat flour.
- _ **To Make Ahead:** Cook and cool pancakes. Separate pancakes with a layer of waxed paper and place in a freezer bag. Reheat in the microwave, toaster, or oven

Source: www.spendwithpennies.com



Perfect Whipped Cream Recipe

TOTAL TIME: 2 minutes

YIELD: 6 Servings

Make this fresh Whipped Cream recipe with just three ingredients in under 5 minutes for the BEST whipped cream for fruit, desserts, and more!



DIRECTIONS

- 1. Prep.** Place mixer bowl and whisk in freezer for at least 20 minutes to chill.
- 2. Whip.** Pour heavy whipping cream, sugar and vanilla into the cold bowl and whisk on high speed until medium to stiff peaks form, about 1 minute. Do not over beat.
- 3. Serve.** Serve immediately or see notes for how to store and freeze.

INGREDIENTS

- _ 1 cup (238 g) cold heavy whipping cream
- _ 2 tablespoons (24 g) sugar confectioner's sugar, honey, or maple syrup
- _ ½ teaspoon (2.5 g) vanilla extract or other extracts or flavorings

Equipment

- _ Hand Mixer
- _ Mixing Bowl

Variations

- _ **Honey** - Replace the sugar with honey
- _ **Maple** - Replace the sugar with maple syrup
- _ **Cinnamon** - Add 1/2 teaspoon of ground cinnamon
- _ **Coconut** - Use 1/4 teaspoon vanilla extract and 1/4 teaspoon coconut extract.
- _ **Chocolate Whipped Cream** - Whisk three tablespoons of cocoa powder with the sugar and follow the recipe as written above.
- _ **Strawberry Whipped Cream** - Make the recipe above until soft peaks form. Add 1/4 cup chilled strawberry jam or puree and beat until medium peaks form again.

NOTES

- _ If not using immediately, store, covered, in the refrigerator.
- _ **How to Recover:** If overmixed, whipped cream will curdle and become lumpy. Slowly fold in 1 tablespoon at a time of fresh, liquid, heavy whipping cream with a rubber spatula until the lumps in the whipped cream disappear.
- _ Note that the amount of heavy whipping cream you use will double in volume in this recipe. Therefore, if you need 2 cups of whipped cream, you will use 1 cup of heavy whipping cream.
- _ **Stabilized Whipped Cream:** For stabilized whipped cream that will hold longer in the refrigerator, add 1/4 teaspoon of cream of tartar to your fresh whipping cream and the confectioner's sugar.
- _ **How To Freeze Whipped Cream:** Place large spoonfuls on a parchment-lined baking sheet and flash freeze. Once the whipped cream is frozen, you can then place it in freezer-safe containers and freeze it. When ready to use, thaw for about 15 to 20 minutes.

Source: www.addapinch.com



Breakfast Egg Muffins

TOTAL TIME: 25 minutes (Prep: 5 minutes, Cook: 20 minutes)

YIELD: 12 Servings

Egg Muffins are the perfect breakfast option for busy mornings. Loaded with all your breakfast favorites, these muffins are simple, savory, and so delicious!



DIRECTIONS

- 1.** Preheat oven to 375 degrees.
- 2.** In a large glass mixing bowl, combine eggs and milk and whisk well.
- 3.** Stir in 3/4 cup cheese, cooked bacon, salt, and pepper.
- 4.** Divide mixture evenly among 12 greased muffin cups.
- 5.** Sprinkle with remaining 1/4 cup cheese and fresh chives.
- 6.** Bake at 375 degrees for 20 minutes or until centers are set and muffins are beginning to brown.

INGREDIENTS

- 10 large eggs
- 1/3 cup milk
- 1 cup cheddar cheese
- 6 ounces cooked bacon
- 1/4 teaspoon salt
- 1/4 teaspoon pepper
- 1 Tablespoon fresh minced chives

NOTES

- **To make in advance:** Bake according to recipe instructions and store in a covered container in the fridge for up to 4 days. You can also prep the egg mixture and store it in an airtight container in the refrigerator before baking. When ready, bake according to recipe instructions.
- **To reheat:** Egg muffins reheat well and make the perfect grab & go option for busy mornings. In the microwave: Wrap individual egg muffins in a damp paper towel and reheat for 30-40 seconds. In the oven: Transfer egg cups to an oven-safe dish, cover with foil, and reheat at 350° for 8-10 minutes. In the air fryer: Reheat at 375° for 3-5 minutes.

NUTRITION FACTS

Serving: 1g | Calories: 171kcal | Carbohydrates: 1g | Protein: 13g

Fat: 12g | Saturated Fat: 5g | Polyunsaturated Fat: 7g

Cholesterol: 180mg | Sodium: 412mg | Sugar: 1g



Peach Freezer Jam



TOTAL TIME: 15 minutes

YIELD: 4-5 Freezer Safe Half Pint Jars (8oz)

A quick and easy way to enjoy peach jam all year long utilizing Freezer Safe Jars!



INGREDIENTS

- 3 cups finely chopped peaches
(about 2 ¼ lb or 7 medium peaches)
- 1 Tbsp bottled lemon juice
- 1 ¾ cups unsweetened white grape or apple juice
- 3 Tbsp Low or No-Sugar Needed Pectin
- Up to 3 cups sugar, ¾ to 1 cup honey, or desired amount of other artificial sweeteners (optional)
- **Note:** Do not use white-flesh peaches.

DIRECTIONS

- 1.** Prepare peaches by running under cold water and draining. Peel and pit peaches. Chop and measure 3 cups.
- 2.** Gradually add Low or No-Sugar Needed Pectin into fruit juice and lemon juice until dissolved. Bring to a full rolling boil that cannot be stirred down, over medium-high heat, stirring frequently. Boil hard 1 minute, stirring constantly. Remove from heat.
- 3.** Immediately add prepared fruit into hot pectin mixture. Stir vigorously for 1 minute. Stir in sugar, other artificial sweetener or honey according to the directions above.
- 4.** Ladle freezer jam into clean freezer safe jars leaving 1/2-inch headspace. Apply lids and let jam stand in refrigerator until set, approximately 24 hours. Serve immediately, refrigerate up to 3 weeks or freeze up to 1 year.

Recipe source: www.ballmasonjars.com



Raspberry Freezer Jam



TOTAL TIME: 15 minutes

YIELD: 4 Freezer Safe Half Pint Jars (8oz)

Enjoy the delicious taste of raspberries all year long with this raspberry freezer jam.



INGREDIENTS

- _ 2 ½ cups crushed raspberries (about 2 pounds)
- _ 4 cups sugar
- _ 3 ounces liquid pectin
- _ 2 tablespoons bottled lemon juice

DIRECTIONS

- 1.** Wash and drain raspberries.
- 2.** In a medium bowl, use a potato masher to lightly crush raspberries.
- 3.** In a large bowl, combine sugar and raspberries until well blended. Let stand for 10 minutes. Add liquid pectin and bottled lemon juice and stir for 3 minutes.
- 4.** Ladle jam into plastic freezer jars, leaving ½ headspace. Adjust caps. Let jam stand 30 minutes to thicken.
- 5.** Label and freeze, refrigerate up to 3 weeks, or enjoy now!

Recipe source: www.ballmasonjars.com



Strawberry Freezer Jam

TOTAL TIME: 30 minutes

YIELD: about 5 Freezer Safe Half Pint Jars (8oz)

A quick and easy way to enjoy strawberry jam all year long utilizing Freezer Safe Jars!



INGREDIENTS

- 2 cups crushed strawberries
(about 2 1-lb containers)
- 2 Tbsp lemon juice
- 4 ½ cups sugar
- ¾ cup water
- 6 Tbsp Pectin

DIRECTIONS

- 1.** Combine prepared fruit with lemon juice in a large bowl. Add sugar, mixing thoroughly. Let stand 10 minutes.
- 2.** Whisk water and pectin in a small saucepan. Bring to a full rolling boil that cannot be stirred down, stirring constantly. Boil hard for 1 minute, continuing to stir.
- 3.** Add cooked pectin mixture to fruit mixture stir for 3 minutes.
- 4.** Ladle freezer jam into clean jars leaving ½ inch headspace. Loosely apply lids and let jam stand in refrigerator until set, but no longer than 24 hours. Serve immediately, refrigerate up to 3 weeks or freeze up to 1 year.

