

Freeze Drying Food at Home: What You Need to Know

How many times have you shoved something into the back of the fridge to “use later,” only to forget about it until mold made it impossible to ignore? It’s fine to fess up; we’ve all been there.

In truth though, all that spoiled food starts to add up. Every year, the average family of four [wastes \\$2,400 on food that spoils](#) before they eat it. Not only is this eye-wateringly expensive, but it's also a massive misuse of the world’s food supply.

What if there was a way to spend approximately the same amount of money and ensure your family never wasted food again? If this seems impossible, you clearly haven’t heard of home freeze drying.

Long-term, low-energy food storage that doesn’t compromise the taste OR nutritional quality of your food. It almost sounds too good to be true, but it’s not. With home-based freeze drying, you can store produce, fresh meat, and even full meals for up to 25 years without risk of spoilage. While this technology might seem more suited to a space-age museum than your basement, today’s home freeze dryers are simple to use and will pay for themselves in no time.

But what is this technology, and what magic does it use to keep food fresh for decades? Let’s dive into the details.

What is Freeze Drying?

Also known as [lyophilization](#), freeze drying is the process of removing water from food by shifting it directly from a solid to a gas. This is called sublimation, and it only happens when water molecules are exposed to extremely cold temperatures and pressure.

In this way, freeze drying involves flash freezing food before placing it in a vacuum, which causes the ice crystals to immediately turn into a vapor. A low-temperature condenser plate then pulls this gas from the chamber, permanently removing it from the food while leaving its structure undamaged. At the end, you have a water-free, chemically-stable product that will last for years if you seal and store it properly with Mylar bags.

When you’re ready for dinner, freeze dried food can be eaten ‘as is’ or rehydrated with water to restore its taste and texture. This means that freeze-dried foods can be cooked and eaten like any other meal for full nutritional benefits.

When Was Freeze Drying Invented?

The science might seem space-age to you, but freeze drying actually predates modern civilization. The Peruvian Incas relied on cold mountain temperatures in the Andes to [freeze their potatoes](#), and the winds and low atmosphere slowly vaporized their water content, producing a product that could be stored for over a decade.

The first machine capable of freeze drying was first invented in 1905, and it was initially used for medical purposes. During World War II, overseas soldiers benefited from freeze-dried medical products like vaccines, organic tissues, and plasma.

During the following decades of peace, the technique was developed further for food preservation. Today, there are over 400 kinds of commercially-available freeze-dried foods. They accompany astronauts into space, are packed for wilderness backpacking trips, stockpiled away by private citizens as a backup food supply, and simply enjoyed for their unique texture and cost-effectiveness for long-term storage.

What are the Benefits of Freeze Drying?

If you've found yourself sulking about slicing food thin enough to fit in your dehydrator or complaining about the clutter that your canning jars create, then freeze-drying might be a better food preservation strategy for you. Below are some of the ways that a home freeze dryer will ramp up your self-sufficiency to a new level.

- **Better Flavor:** Freeze drying lets you retain the fresh flavor of your food, and rehydrating it restores much of the natural texture.
- **More Attractive:** Does the shriveled appearance of dehydrated fruit turn you off? Freeze drying ensures your food won't shrink or shrivel during processing.
- **97% Nutrients Intact:** Flash freezing preserves your food at peak nutritional value, unlike other methods that use heat which can destroy up to half of the nutrients. Best of all, you get decades of preservation without adding any unhealthy preservatives like sodium nitrate, high fructose corn syrup, trans fats and more.
- **Longer Shelf Life:** Imagine, you could be eating tonight's lasagna 25 years from now. That's how long freeze-dried foods can last, even when stored at room temperature. Compare that to dehydrated food (4 years), canned food (3 years), and frozen food (2 years), and it's clear that freeze drying is the best way to be prepared.
- **Cost Effective:** Eradicating food waste alone will make up the cost of your freeze dryer.
- **Easy Preparation:** Freeze drying your food couldn't be easier. Just prepare it as you prefer (cooked or raw food works equally well), pop it in the dryer, and you're good to go. No tricky measurements or exact timing needed.
- **Lightweight Storage:** Almost the entire weight of food comes from its moisture content, so freeze-dried foods are incredibly light, making them ideal for taking on camping trips or adding to your emergency evacuation supply.
- **Less Pantry Space:** No bulky jars are needed to store your freeze-dried food, just vacuum-sealed Mylar bags that take up significantly less space than fresh food.
- **Less Waste:** Sick of tossing your leftovers every week? Freeze drying allows you to preserve them for a future date. As the average family throws away close to 40 percent of

the food they throw away each year, freeze drying lets you bring this percentage down to zero.

How to Use a Home Freeze Dryer

Freeze-drying your own food couldn't be more straightforward when you have the right equipment. Harvest Right is the industry leader in home freeze drying, and they provide 3, 4, and 5 tray home systems for a capacity between 1 and 2 gallons of fresh food.

To put your freeze dryer to use, just load each tray with prepped food, ensuring that nothing touches. Blanching is best for vegetables, and soups will dry faster if you make them thicker than the recipe calls for. As each load takes between 24-48 hours, it's best to fill each tray for every load to maximize efficiency.

Once you start the dryer, the chamber temperature will drop, and it will begin to seal itself. Eventually the food will be frozen solid, allowing the included vacuum pump to push air out of the chamber. This causes the ice to phase directly into water vapor, which then flows out of the chamber and condenses into water far from the food.

This process continues for hours until all the water is removed. However, there's little reason for you to worry about it. Once started, the HarvestRight will self-monitor itself throughout the process, leaving you free to ignore it until the batch is finished.

Storing Freeze Dried Food

Once thoroughly dried, freeze dried food should be stored in moisture-free packaging to maximize its shelf life. So long as the packaging is secure, it can sit directly on pantry shelves without risk of spoiling. Mylar bags are the simplest and most practical preservation method, especially if you add oxygen absorbers directly to the package. Canning jars also work well when the food is stored in a cool, dark place (like your basement), and vacuum sealed bags will even give you a few years of life for your food.

Freeze dried food is light and crisp, usually reminiscent of chips or crackers. Fruits, vegetables, and even meat can be eaten dried for an intensely flavored snack, and freeze-dried yogurt drops are a foolproof favorite for kids and adults alike.

What Foods Can You Freeze Dry?

Most foods are suitable for freeze drying, including fruits, vegetables, herbs, dairy products, meat (raw or cooked), whole meals, desserts, and grains like bread and pasta. You can also freeze dry liquids like soup or yogurt, and instant coffee is the most popular freeze-dried food of all time.

Foods that are mostly fat are NOT suitable for freeze drying, as the fat can melt and coat the inside of your machine. Sugary jams also don't work, though fruit on its own is fine. Likewise, lettuce and watermelon are also poor choices for freeze-drying because their water content is so high that they lose their structure when it's removed.

How Do You Rehydrate Freeze Dried Food?

For the harried homesteader struggling to put dinner on the table each night, freeze-dried food is a significant time saver. Full meals take just minutes to rehydrate, and they retain most of their original taste and texture in the process.

Simply place the food in a bowl of hot water for five minutes or less to let it draw the water it needs, draining away the excess. Bread and pasta dishes are best steamed so that they retain their shape. From there, you can heat the food in the microwave or cook the meat or vegetables like you would fresh. Delicate greens can be gently spritzed or crushed into pasta sauce.

Once you get your freeze dryer, you'll be amazed at the number of ways you can put it to use. Food that might once have been a science museum novelty may wind up in your weeknight dinners more often than you'd expect.