

Storing Dry Foods Properly

*This document is for dry items such as grains, legumes, pasta, fruits and vegetables that are tried “to a crisp”, potato flakes without added oils, and non-fat powdered milk. Preserving wet goods like canned fruits, vegetables, meats, or salsas require different methods and procedures.

There are four main factors that will affect the shelf-life of foods and determine how long they store and retain nutrients. These things are:

1. Moisture
2. Air or Oxygen exposure
3. Light
4. Heat or temperature

Foods that are not stored properly can spoil, lose nutrition, and attract bugs or rodents. Any one of these problems can render your food unusable when you need it, so you it is important that anything you plan to store is taken care of when you get it. Leaving it in the package can be a problem if you are not going to use it right away. So, what do you do?

1. Choose a container that you plan to store it in. Below are some of the best available options.
 - a. **Cans** – Metal cans provide a sealed environment that does not let in moisture, light, or oxygen easily. If food has been properly cared for and sealed properly, and the cans are placed in a cool environment (under 70° F and above freezing), you will have an optimal storage condition. Dried- goods like grains and legumes stored in cans in a cool, dry place can last even longer than some of the average shelf-lives given. Some will last 30 years depending on the food. However, it is becoming difficult to put your own food away in cans without special equipment, and the cans are usually not reuseable. Here are more options. *Sometimes gas from the oxygen absorber put in cans can cause an unpleasant gas over time and you should leave the can open for 24 hours to allow this to dissipate before you decide the food has spoiled. This is especially true for flour.
 - b. **Canning Jars** – Glass canning jars do not allow moisture or oxygen to enter once they are sealed, and they are not easily penetrated by bugs and rodents. Fore these reasons, they are one of my first choices for taking care of dry goods at home for long term storage. I like them because they are easy to see what is inside and to refill. To seal a jar with dry goods requires either an oxygen absorber or a special device that vacuums air out of the jar allowing it to seal. *Food Saver* is one brand that makes such a device. Oxygen absorbers can be purchased on-line or from places that sell emergency supplies. The downside to jars is that they are breakable in an earthquake or other disaster, and it is important to control both heat and light where you store them. When food is stored in this way, the shelf-life, as long as it stays sealed is comparable to that of cans. *You can reuse canning lids that have previously been used for dry-pack storage.

- c. **Plastic Buckets** – Buckets designed for food storage that have a tight seal can be used to store dry goods. Because plastics are gas permeable the shelf-life is almost half of that of cans and glass jars. Air must be displaced to reduced spoilage. For most buckets in which grains, pasta, and legumes are stored, using dry ice to displace air is the recommended method. Some people use oxygen absorbers, but it is less effective in this application. Oxygen absorbers are added throughout the bucket – one per 3-4 quart capacity and when the bucket is full, the lid is pounded on. Or Dry ice is added to the bottom of the bucket, then the food being stored to the full point. When you can see that the dry ice is gone at the bottom of the bucket a rubber mallet is used to pound the lid on. Buckets can be difficult to move when full, and should not be stored directly on cement where they can come in contact with moisture and even absorb a cement taste and smell. They are good for large families that can use the contents quickly once they are opened, and they are good for people who rotate their storage often. For small families or those who plan to keep the food long term I recommend the small “pantry pails” rather than 5-6 gallon buckets. *You can buy gamma lids for the storage pails. These lids allow you to screw a lid that seals off and on to the bucket, keeping the contents clean and cared for after you open it. This is nice even if you choose to have one for each kind of thing you store in buckets so that you can use it for the bucket you currently have open.
- d. **Buckets and packages** - Some people want to store goods in their original packages. Putting packages or boxes directly on a shelf is not a good idea. The food inside can pick up moisture, air, and is easily accessible to vermin (bugs and rodents). No one would want to attract vermin consciously. If you want to keep the food you buy in bags, boxes, packages, Mylar, or paper (even for short term storage) it is advisable to put these packages in a bucket that can seal tightly. I have chosen to do this with things like flavored gelatin. (I take the packages out of the boxes.) Know that it will not store for years and years, and it can possibly “share flavors” over time. However, it is still a viable way to tuck food away fairly safely. I count these things in my short term storage that can last from 1-5 years and I do not worry about oxygen absorbers. *Any item containing oils of any kind will have a short shelf-life. Very cool and dark storage will increase shelf-life.
- e. **Sealed Mylar bags** – These are somewhat gas permeable. While they are a nice way to keep food in your freezer, you need to take extra precautions before putting them directly on your storage shelves. Both bugs and rodents can penetrate Mylar and plastic bags. I highly recommend keeping these types of packaging inside a sealed bin or bucket. (Even a bakery bucket is possible.) Cellophane packaging will break down over years (especially in the heat of a garage) and flake into your food inside a bucket, so Mylar has advantages over such plastics. Still, I would not count on keeping things stored this way for extremely long periods of time. They have not had oxygen and moisture removed, and that is difficult to control in a bucket.

- f. **PET 1 bottles** (polyethylene Terephthalate) – This kind of plastic is less gas permeable than most of the other kinds, and leaches chemicals less. These are the bottles that are made of clear plastic. Most of the time you can find a little triangle on the bottom of the bottle with a 1 in it. They usually hold drinks such as soft drinks, sports drinks, and juices. I like the ones that have wider mouths because you can get an oxygen absorber in and out easily and it is easy to get the food in and out as well. Water bottles are now made too thin to be good for food storage. However, others are good for water storage and also for dry goods. The best ones have a soft seal in the threaded lid. To test a bottle and see if it is a good choice, screw the lid on tight and put the lid and neck of the bottle under water. Squeeze it to see if any air leaks out. When it does not, you have a good storage bottle. All you need to do to take advantage of this is wash it after use in warm soapy water and let it air dry completely. I personally love using these bottles, especially for short term storage, because they don't break easily or require special equipment, I can see what is in them and refill them easily. If I do not plan to store the contents more than 2 years I simply fill them and screw the lid on. If I think that the food inside them needs to last longer I add an oxygen absorber, screw the lid on, and put them in a box in a cool, dry place. Stored in this way, your food will probably not last as long as it would in metal or glass, but it will last longer and better than many opaque buckets and certainly longer than most store packaging.

Special Notes:

- Seeds, grain, and legumes that are stored with an oxygen absorber will lose the ability to sprout and grow over time. This happens with the lack of air. If you want to keep seeds it is best to use food grade diatomaceous earth to control bugs instead of an oxygen absorber. Still, seeds are not a long-term storage item.
- Do not use oxygen absorbers with sugar, or it can become a solid lump. Moisture absorbers or nothing are a better choice.
- Foods with oils such as nuts and dried meats are only suitable for short-term storage in a cool and dark place. Fruits store longer than vegetables because of their sugar content, and whole grains store longer than fruits. Most processed foods are not good long-term storage items.
- Short-term storage is food that you are eating and rotating on a regular basis so that you have a three month supply in case you need it. These are things you will have in storage less than 5 years. Long-term storage are items that can last 10-30 years.
- When using oxygen absorbers, they will lose their effectiveness in 20 minutes of exposure to air. When you open a bag of them you should put them in a small canning jar or other glass jar with a lid that has a sealing ring inside the lid. As they begin to absorb the oxygen the jar should seal. Get everything ready before opening the jars. Do maybe 12 jars or other containers at a time. Open the jar of absorbers, take out only what you need and put the lid back on. Work fast to place the absorbers, fill the jars, and tighten the lids on. Then do the next group the same way.