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Dehydrated Food Shelf Life

There are many factors that can affect the storable life of your dry and dehydrated bulk food. Please take the time to read this information page if you are not aware of how foods are packed and how they should be stored.

Dehydration techniques have come a long way in recent years. Old technology left as much as 30% moisture in the dehydrated products. These poorly dehydrated foods didn't store very well. Recent advancements in technology have made significant improvements, with moisture levels now at 2% or 3%. Gone are the pliable dehydrated foods. Now they break with a crisp "snap" when bent.

With moisture levels reduced to 2%-3%, storage life has been increased several years. Cans of 8 year old dehydrated carrots and onions taste as good as freshly dehydrated carrots and onions. These had previously been stored in a warm garage for at least 3 years. 15 year old potato flakes were tested with positive and impressive results.

Don't expect dehydrated vegetables to taste exactly like their fresh or canned counterparts. Generally speaking, dehydrated foods won't have quite as strong a flavor as fresh foods. Almost in every case, however, after adding a little butter and salt and pepper, prepared, dehydrated food is every bit as tasty and sometimes even better tasting than canned vegetables.

Non-vegetable foods (grains, spagehetti, etc.) taste every bit as good as what you've come to expect. In fact, our bread mixes, muffins mixes, pancake mixes are excellent, some of the best tasting products available.

Storage Temperature

It is important to keep in mind that not only do colder temperatures affect shelf life of food products, temperature fluctuations affect shelf life too. Keeping your food stored at a constant temperature will help you achieve the maximum shelf life. As you can see from the above chart, it is not that hard to obtain 10+ years on your food storage. Finding a cool, dry location, such as a basement or root cellar is perhaps your best insurance on maximizing the shelf life on your stored foods.

Storage Life & Temperature	
Temperature and temperature changes have the most to do with the shelf life of stored food then any other factor. The USDA states, " Each 5.6 C. (10.08F) drop in temperature doubles the storage life of the seeds. " Experience has shown that this applies to foods too.	
Temperature	Years
37.6	40
48.4	30
59.2	20
70.0	10
80.8	5
91.6	2.5
102.4	1.25

(See also the product chart below)

Foods that will be prepared and consumed rapidly don't need any special storage requirements. Such foods can be stored at room temperatures with no appreciable loss of quality or nutrition. The above chart demonstrates that bulk food can be stored in warm areas for several years. We don't recommend this for businesses and individuals that are plan to store food for long lengths of time.

Moisture Content

Many products, such as dry beans, grains, and flours contain an average amount of 10% moisture.

Although it is not necessary (and very difficult) to remove all moisture from dry food, it is important that any food stored be stored as dry as possible. Excess moisture can ruin your food stored.

Oxygen Content

Oxygen can be removed from the food storage container, resulting in the food lasting much longer than normal. Oxygen, naturally found in air will oxidize many food compounds. There are a couple of techniques used to remove oxygen from food containers:

- **Displacing the oxygen with nitrogen:** Air is purged out by inserting a nitrogen wand into the bucket. Nitrogen is the most inert gas known.
- **Absorb the oxygen:** Oxygen absorber packet absorb the oxygen. Air contains about 78% nitrogen and 21% oxygen, leaving about 1% for the other gasses. The oxygen is absorbed, leaving about 99% pure nitrogen in a partial vacuum. Our food product in cans or buckets all come with oxygen absorbers in their containers.

Storage Containers

An air tight seal on the food storage container is a must. All of our food is packed in air tight, sealable food grade cans or buckets (except for items ordered in bags of course) with an oxygen absorber.

Average Shelf Life

Below is a chart to help you determine the shelf life of food stored in air tight containers at constant temperature of **70 degrees**. ** All of the following products will store **proportionally longer** at cooler temperatures if kept at lower storage temperatures. Shelf life of 30+ years is perfectly feasible for many products!

	Years		Years		Years
Apples	30				
Adzuki Beans	8 - 10	Gluten	5	Powder Eggs	15
Alfalfa Seeds	8	Granola	5	Powder Milk	20
All Purpose Flour	15	Great Northern	15	Quinoa	8
Bakers Flour	15	Groats	8	Refried Beans	5
Barley	10	Hard Red Wheat	25 - 30	Ribbons	8 - 15
Black Turtle Beans	15 - 20	Hard White Wheat	25 - 30	Rolled Oats	30
Blackeye Beans	15 - 20	Honey, Salt and Sugar	Indefinitely	Rye	8
Broccoli	8 - 10	Hulled Oats	30	Small Red Beans	8 - 10
Brown Rice	6	Kamut	8 - 12	Soft wheat	25
Buckwheat	15	Kidney Beans	20	Soy Beans	8 - 10
Butter/margarine Powder	15	Lentils	20	Spaghetti	15 - 20

Cabbage	8 - 10	Lima Beans	20	Special bakery wheat	25
Carrots	8 - 10	Macaroni	15 - 20	Spelt	12
Celery	8 - 10	Millet	8 - 12	Sprouting Seeds	4-5
Cheese Powder	15	Mixes	5 - 10	Triticale	8 - 12
Cocoa Powder	15	Morning Moo	10	TVP	15 - 20
Corn	8 - 12	Mung Beans	8 - 10	Unbleached Flour	5
Cornmeal	5	Noodles	8 - 10	Wheat flakes	15
Cracked wheat	25	Onions	8 - 12	Whey Powder	15
Durham Wheat	8 - 12	Peanut Butter Powder	4 - 5	White Flour	5
Flax	8 - 12	Pearled Oats	10	White Rice	8 - 10
Fruit	5	Peppers	8 - 12	Whole Wheat Flour	5
Garbanzo Beans	15 - 20	Pink Beans	20 - 30	Yeast	2
Garden Seeds	4	Pinto Beans	20 - 30		
Germade	5	Potatoes (flakes , slices, dices)	20 - 30		

Predicting actual shelf life of dehydrated foods is not an exact science, however there have been many studies done. In addition to the above average shelf life of food stored at a constant 70 degrees, you can dramatically increase your life expectancy by lowering the constant temperature. **It is possible to double, triple or even quadruple the shelf life by lowering the temperature proportionally.**

Some products, such as seeds, can even be frozen for dramatically increased shelf life. The basic rule of thumb is to store you food storage in as low of temperature as possible to increase its shelf life and to retain nutritional value.

A new study by the [Department of Nutrition, Dietetics and Food Science at Brigham Young University](#) (*.pdf file) tested several varieties of dehydrated stored foods in #10 cans. They have learned that shelf life is **considerably longer** then previously thought. Here are their findings:

Nutritional Adequacy and Shelf Life of Food Storage by Dean Eliason and Michelle Lloyd

Is my food storage still edible? How is the nutritional value?

In the Department of Nutrition, Dietetics and Food Science at BYU, we have conducted research on long-term storage of food. We have collected samples of dry food stored in No. 10 cans for up to 30 years at room temperature or cooler. So far, we have following food products: powdered milk, rice, baking powder, instant potatoes, dried apples, all-purpose flour, pasta, pinto beans, wheat and powdered eggs.

From this testing, we can generally conclude that if properly packaged and stored, all of these foods store fairly well, except for the powdered eggs. In general, the vitamins we have measured (thiamin, riboflavin, vitamin C, vitamin E) in properly stored foods are

fairly stable over time. If you think your food storage is getting too old, the best test would be for you to try a sample and decide if it is edible to you. Some people are more picky than others about the food they eat.

What is the nutritional value of basic food storage?

A year supply of basic food storage (400 lb wheat, 60 lb dry beans, 60 lb sugar, 16 lb powdered milk, 10 qt oil, 8 lb salt) provides adequate calories but is lacking in calcium as well as vitamins A, C, B12, and E. Vitamins A and C can be found in canned or bottled fruits and vegetables as well as in some fruit drink mixes. Most vitamin C is destroyed during dehydration of fruits and vegetables, but some vitamin A remains. Good sources of vitamin A include canned pumpkin and dehydrated carrots. Vitamin B12 comes from animal sources and can be found in canned meats and jerky. Calcium comes mainly from dairy products such as powdered milk, hot cocoa mix, and pudding mix (containing dried milk). Vitamin E is found in fats and oils and can be found in nuts such as sunflower seeds and almonds.

[Keeping Food For Years](#) (Science Daily Article)

FOOD STORAGE - THE BASICS

Since the entire idea of a food storage program is that it should be available for you and yours in times of need, it is important to understand the conditions that can affect the edibles stored in your pantry.

A storage program is only as good as the quality of the food that goes into it. It cannot get any better than what originally went in, but it can certainly get worse. In the fullness of time, all stored foods will degrade in nutrients and palatability until they reach the inevitable end where even the dog won't eat them. It's because of this eventuality that every article, book, and teacher concerned with putting food by gives the same advice: Date all food containers and rotate, Rotate, **ROTATE**.

The first food in should be the first food out. This concept is often shortened to the acronym FIFO.

The reason for this emphasis on stock rotation is that when discussing the usefulness of foodstuffs there are really two shelf lives to be considered - the nutritional life and the palatability life. Nutritional content actually begins to fade at the moment of harvest with three major factors influencing nutrient retention: The food's initial nutrient content; the processing and preservation steps the food underwent; and the storage conditions in which it's kept. Given sufficient time, all but the most durable nutrients will dwindle away to nothing. Unfortunately, there is no good way outside of laboratory testing to know how much nutrition is left in a given food, but we can make our own determinations about other criteria which leads us to the palatability life mentioned also mentioned above.

A food's palatability life is the point at which undesirable changes occur to foods taste, texture, color and cooking qualities. This is the reason for the "use by" and "sell by" dates on many foods and for shelf lives in general. It will almost always be in excess of good nutritive life. If you don't have anything to replace old food with, it's not necessary to throw the food out just because it's reached the end of its best palatable storage life. Do, however, keep in mind that advancing age will only further decrease the useful nutrition, increase the foods' unattractiveness to being eaten and enlarge the chances that something may cause the food to spoil.

Within reason, the key to prolonging the shelf life of your edibles lies in lowering the temperature of the area they are stored in. The storage lives of most foods are cut in half by every increase of 18° F (10° Celsius). For example, if you've stored your food in a garage that has a temperature of 90° F, you should expect a shelf life less than half of what could be obtained at room temperature (70° F) this in turn is less than half the storage life that you could get if you kept them in your refrigerator at 40° F. Your storage area should be located where the temperature can be kept above freezing (32° F) and, if possible, below 72° F.

Ideally, your storage location should have a humidity level of 15% or less, but unless you live in the desert it's not terribly likely you'll be able to achieve this. Regardless, moisture is not good for your dry stored edibles so you want to minimize it as much as possible. This can be done by several methods. The first is to keep the area air-conditioned and/or dehumidified during the humid times of the year. The second is to use packaging impervious to moisture and then to deal with the moisture trapped inside. If you are able, there's no reason not to use both.

All containers should be kept off the floor and out of direct contact from exterior walls to reduce the chances of condensation brought on by temperature differences between the container and the surface it's resting against.

Another major threat to your food is oxygen. Chances are that if your foods are sealed in moisture-proof containers the containers are probably air-tight as well. This means that the oxygen can also be kept from doing its damage. If no more can get in, your only concern is the O₂ that was trapped inside the container when it was sealed. Lowering the percentage of O₂ to 2% or less of the

atmosphere trapped inside the packaging (called head gas) can greatly contribute to extending its contents shelf life. The three main tactics for achieving this are vacuum sealing, flushing with inert gas or chemically absorbing the oxygen. Any one or a combination of the three can be used to good effect.

Once you have temperature, humidity and oxygen under control, it is then necessary to look at light. Light is a form of energy and when it shines on your stored foods long enough it transfers some of that energy to your food. This has the effect of degrading nutritional content and appearance. Fat soluble vitamins, such as A, D, E, and K are particularly sensitive to light degradation. It certainly is a pretty sight to look at rows and rows of jars full of delicious food, particularly if you were the one that put the food in those jars. However, if you want to keep them at their best, you'll admire them only when you turn the light on in the pantry to retrieve one. If you don't have a room that can be dedicated to this purpose then store the jars in the cardboard box they came in. This will protect them not only from light, but help to cushion them from shocks which might break a jar or cause it to lose its seal. For those of you in earthquake country, it's a particularly good idea. When "terra" is no longer "firma" your jars just might dance right off onto the floor.

Assuming they were properly processed in the first place, canned, dried and frozen (never thawed) foods do not become unsafe when stored longer than the recommended time, but their nutrient quality fades and their flavor, color and texture goes downhill. Following these rules of good storage will keep your food wholesome and nutritious for as long as possible:

1. First In, First Out (FIFO) means rotating your storage
2. Cooler is better
3. Drier is better
4. Less oxygen exposure means more shelf life.
5. Don't shed light on your food.

Think of rotating your food storage as paying your food insurance premiums -- slacking off on rotation cuts back on your coverage. Is your food insurance up to date?

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Biscuits Blueberries Cook Books	Gelatin Germade Gluten Grain	Potatoes Pudding	
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