

It's time to rethink long-term food storage

By Jeffrey R. Yago P.E.

I don't claim to be an expert in food packaging, but I can tell something is wrong with the way long-term survival food is being packaged, marketed, stored, and consumed. Most Preppers and those trying to live a more independent lifestyle will be buying at least some freeze-dried and dehydrated foods sold in #10-size metal cans, plus grains packed in large white plastic buckets.

To achieve a much longer shelf life, early food processors injected dry nitrogen gas into the cans and buckets to displace any remaining



These reconstituted freeze-dried butter, cheese, and tomato paste powders have the consistency and taste of the original fresh products even after 15 years

oxygen just before sealing the lids. Most of today's food processors toss in an oxygen absorber packet just

before the lid is sealed and no longer inject nitrogen. Oxygen causes food spoilage and allows any microscopic creepy-critters typically found in harvested wheat and grain to continue to live inside the sealed buckets, which is why removing all oxygen and keeping it out is the highest priority to achieve a long shelf life.

Many people consider all long term foods as having the same shelf life, and do not realize there are actually different canning processes which produce different shelf life results. For example, anything freeze-dried then canned with an oxygen absorber will have the longest shelf life since over 99% of the moisture content is removed. Freeze drying is the most expensive way to process survival type foods, but it can achieve a shelf life exceeding 25 years with no



Oxygen absorber packets are now typically used in all long-term food packaging.



#10 cans of freeze-dried foods having premature failure
(can labels intentionally removed for all photos)

loss of nutritional value or taste. It is typically used for more expensive “mixes” of different ingredients like stews, chowders, and complete meal dishes.

Dehydrated foods are sometimes mistakenly thought of as being the same as freeze dried foods, but this is not the case. The dehydration process is less expensive than freeze drying, but still includes adding an oxygen absorber during canning. The evaporation process removes up to 90% of the moisture content which leaves more moisture than freeze drying, but can still achieve up to 15 years of shelf life. Typically dehydration is used for individual foods including separate fruits, vegetables, soup stock, powdered eggs, powdered butter, and powdered milk, although this process can still be used with foods normally freeze dried to reduce cost.

There are some long-term foods that are neither freeze dried or dehydrated, but still have a long shelf life due to a higher level of care during the canning process and also using an oxygen removal packet before seal-

ing. These food products include rice, wheat, oats, popcorn (to make corn meal), spices, dried beans, dried pasta, sugar, and salt.

While sugar and salt have an unlimited shelf life when kept clean and dry, most of these other canned products will have a shelf life less than 10 to 15 years due to loss of nutritional value or taste over time. However, as will be discussed later in this article, these shelf life estimates can vary significantly between different food groups and canning processes.

I started buying the large #10 cans of freeze-dried and dehydrated foods and large white buckets of wheat, rice, and diced potatoes when we were told the world was going to end on December 31, 1999 when all the computer clocks turned back to zero. Needless to say, the world didn’t end, but this event did get me started using extended-life food storage.

Over these past 18 years our pantry has slowly filled to capacity as I keep putting off a badly needed purge of older stocks. However, during a recent room renovation project I

finally started the sorting process and removing anything nearing its expiration date. While we do rotate all of our everyday canned goods in the pantry, these larger and more expensive bulk food cans and buckets were not being rotated as often, if at all.

I have always purchased name-brand freeze-dried and dehydrated food products, and I check every item to make sure they were grown and processed in the United States. We have continued to buy bulk foods and grains each year and now have a large collection representing 18 years of purchases. Our pantry is actually a room about the size of an average

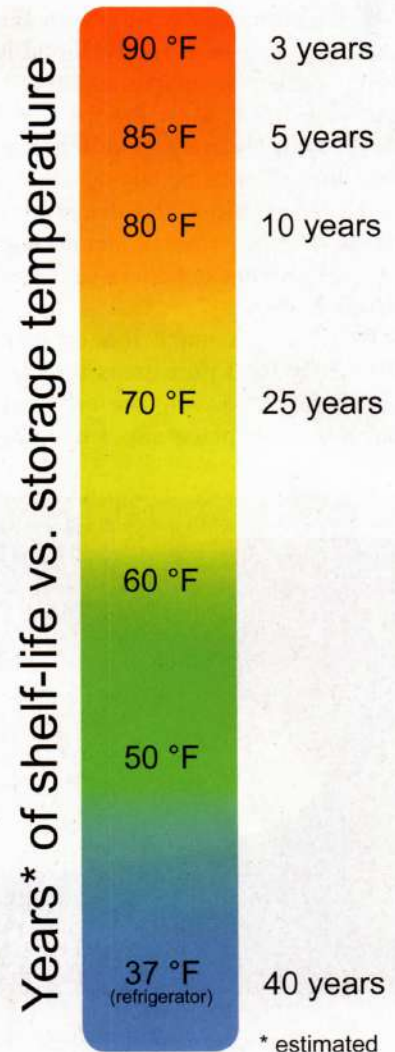


Figure 1



Left, A bucket of wheat under negative pressure. Right, this lid sheared off of plastic pail from negative pressure.

bedroom with wall-to-wall and floor-to-ceiling shelving.

However, as I started into this long-overdue house cleaning process, I immediately noticed something was seriously wrong. You will notice in the photos I have removed the labels since my goal was not to shame any one specific brand or supplier. I assure the reader I found plenty of failed containers and spoiled foods representing multiple name brands and suppliers that most would easily recognize. In addition, while preparing this article I contacted several friends I know who are also into buying large quantities of long-term survival foods and they each shared similar failed container and spoilage complaints.

Many of the #10 cans were bulging out like a balloon at both the top and bottom, and in many cases it was the newer cans from the same supplier, not their much older cans that had spoiled. As I started checking the heavy plastic buckets of wheat, rice, and potatoes, I also found most of the older buckets were still in excellent shape, while a large number of the newer buckets had either split open, or were under so much negative pres-

sure the sides almost touched in the middle and looked like a white plastic hourglass.

Several of our buckets of wheat had been under so much negative pressure the bucket walls had split and wheat was falling onto the floor. Suppliers are quick to tell you a deformed plastic pail is just a sign the oxygen absorber is working properly,

but that's little comfort when half the wheat has spilled out onto the floor through a large split down the side!

Two of the sealed lids had been sucked down into the buckets and had completely sheared off from their rims which were still attached to the top. Most of the failed packaging was processed more recently, while almost all of the older buckets didn't show



Rusted 3-year old cans of coffee

Years* of shelf-life vs. food type

* estimated

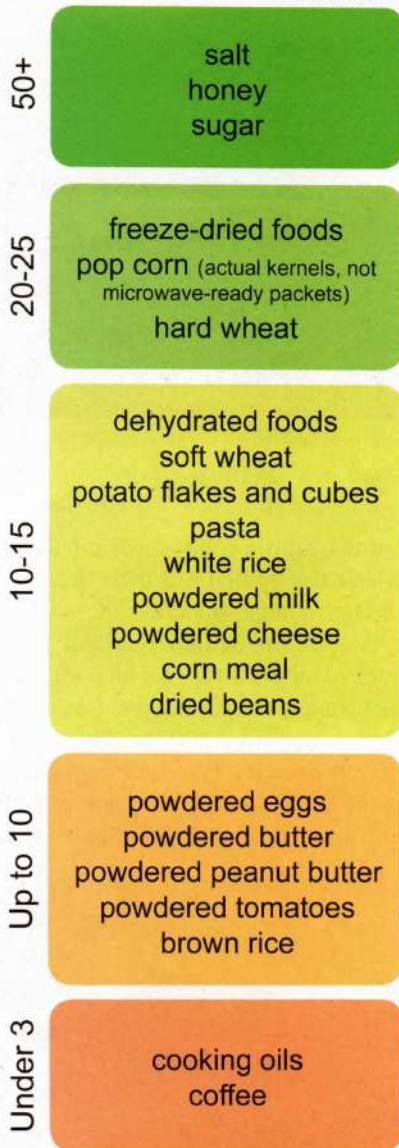


Figure 2

any sign of failure. I realize it may not be fair to just compare age regarding these failed containers, as both the oxygen removal and canning processes have undergone changes during the past few years. It's also true some foods are more susceptible to spoilage than others, especially if storage temperature is higher than rec-

ommended, but this does not excuse these problems.

Some food processors are starting to seal bulk foods in a Mylar bag with an oxygen absorber before the bag is heat-sealed closed. This sealed Mylar bag is then placed in an empty plastic pail which allows the bag to contract as oxygen is slowly removed without distorting the outer bucket wall. Older canning procedures did not use the inner Mylar bag.

Most #10 metal cans for freeze-dried and dehydrated products have a food-grade inner coating so the food does not come in direct contact with the metal which can affect taste. The majority of long-term food storage processors now use an oxygen absorber packet in all packaging. So why are the newer metal cans and plastic buckets of long-term foods failing, while many older ones still show no sign of failure?

For example, two identical #10 cans of 25-year life food products have expanded and will no longer stand upright even though they both are only two years old! Many of these failed cans were purchased by the case so these are not isolated failures.

I opened a case holding six #10 cans of freeze-dried powdered tomatoes and every single can had spoiled with ballooned-out tops and bottoms. This case of tomatoes cost over \$200 and were less than ten years old.

I then began checking our regular canned goods on upper shelves which required moving aside several large cans of ground coffee. I was immediately covered by a brown cloud of dust falling from above which turned out to be heavy rust from the sides and bottoms of these coffee cans. None of the other cans in the pantry had any signs of rust and most were years older. I understand after two or three years most vacuum-sealed coffee can become bitter, but I think it's reasonable to expect that the cans won't rust through before this happens.

As I continued to sort out the various cans, I noticed a dark stain under one of the lower shelves. Bending down I found a three-gallon container of cooking oil was now empty and all of the oil had leaked out damaging several bulk paper products below before being absorbed by the room carpeting. Yes, cooking oils have a relatively short shelf life and should be rotated out regularly. However, just because the oil has slightly passed its expiration date is no reason for the container to split open.

I am concerned that we have been buying expensive cans and buckets of long-term foods under the mistaken belief that all of these foods and grains will actually stay fresh and still taste good all the way up to 25 years. I am also concerned that some suppliers may not be testing to determine the correct amount of oxygen removal for a given food weight, food type, and size of container.

I once read about archeologists finding sealed clay jars containing wheat when excavating a pyramid in Egypt that was over 2,000 years old, and when the ancient jars were opened and the wheat was ground into flour it made perfectly eatable bread.

Today we have an amazing selection of extremely durable metals and plastics to choose from. We also have adhesives that can glue ceramic tiles on the nose of a space shuttle. I can't even open the child-proof tops on my prescription medication without channel locks, and I need a razor cutter to free any DVD purchase from its plastic packaging.

You would think some of this newer packaging technology would filter down to the packaging and processing of long-term stored foods. We need to insist all advertising claims must be based on real world product testing. If it is advertised to last 25 years, it should still be reasonably fresh and still taste good throughout these 25 years.



A food pantry can be just a closet, roll out slides under a bed, or fill an entire room.

Finally, let's not let the Prepper community off the hook. We need to do a better job of maintaining the recommended temperature of our pantries to meet manufacturer recommendations, and rotate out any products long before they reach their expiration dates.

The main factor that will drastically reduce the shelf life of all stored foods is room temperature. For example, many long-term food storage products are advertised to have a 25-year life expectancy *when stored below 70°*. Figure 1 indicates how

storage temperature impacts any 25-year shelf life claim.

Which canning process was used and the type of food being canned will ultimately determine its maximum shelf life, and in many cases this will be far less than 25 years.

While many long-term food products may last 25 to 30 years without spoilage, this does not guarantee they will retain their full nutritional value and taste to the end of the shelf life indicated on the label. Figure 2 considers these factors and is not intended to show the maximum shelf life of these stored foods.

In many cases, I found wide differences between manufactures and government agency shelf life estimates for different freeze-dried and dehydrated foods, so I have tried to present a reasonable compromise when these differences occurred.

Summary

While product advertising of long-term survival foods will most likely continue to reference a 25-year life as the gold standard, it's way past time for all Preppers to take into account how higher space temperature will drastically reduce this shelf life. It's also important to realize that while modern processing may prevent food spoilage for up to 25 years, this is not a guarantee the food will retain its full nutritional value or perhaps not taste like library paste long before reaching the advertised 25-year life.

I use a permanent marker pen to write the current month and year on the top of every #10 can and large plastic pail of long-term foods and grains I buy. I also take into consideration the difference between food product types in regards to shelf life when rotating out older cans. I also consider that some foods will need to rotate out much sooner than their promised shelf life when nutritional value and taste are taken into consideration. I am hoping suppliers and producers of extended-life stored foods and grains will do a better job in both their advertising claims and their quality control.

Finally, remember no matter how much freeze-dried and dehydrated food you have in reserve, it's all useless if you do not also have enough fresh water to reconstitute these foods. You must also drink each day during a long-term crisis. ☺

Jeff Yago is a licensed professional engineer and certified energy manager with over 40 years of solar and emergency preparedness experience. He has authored numerous articles, and his just released book titled "Lights On" is available from www.offgridprepper.com.