What is Shelf Life and Why I Should Care?

Anyone thinking of becoming self-reliant or a Prepper has heard the term Shelf Life or Shelf Stability Life. What exactly does this term mean?

According to several leading dictionaries:

Shelf Life or Stability Life means the length of time a packaged food, chemical, or product etc, will last without deteriorating and/or remains effective, useful, or suitable for use and/or consumption without danger.

"Life sustaining" shelf life refers to food only and means the length of time food preserves life, with at least moderate nutritional value and without becoming inedible.

> Where food storage is concerned this means that although the food item may look, smell, feel and taste just fine – it has lost most or all of its nutritional value. Essentially we can starve to death while eating.
>
> Flour which doesn't have much of a shelf life, will fail to behave as "fresh" flour will; the cake won't rise or the biscuits will be dense as rocks.
>
> Another example is tires, we can purchase brand new tires and because of their age and how they were stored they will behave as tires that are years older. This creates a danger when we drive on them.
>
> Even ammunition, which has an almost indefinite shelf life when store properly; when not stored properly can fail to fire correctly resulting in misfires, low velocity firing and even explosive firing. All of which are very dangerous.



Shelf life of any product varies greatly according to how it was processed, packaged, transported, handled and stored.

Bottom Line: Just about everything and anything has a shelf life to it, even tires, ammunition, drugs, detergents, food and so on. Some shelf lives are short, others long. No matter what, **Shelf**

Life depends on the manufacturing (food preservation) **method, packaging method & medium, and the storage and usage environments.**

To preserve your food storage, keep it away from…

- Humidity (moisture)
- Air (oxygen)
- Light
- Temperature (heat)

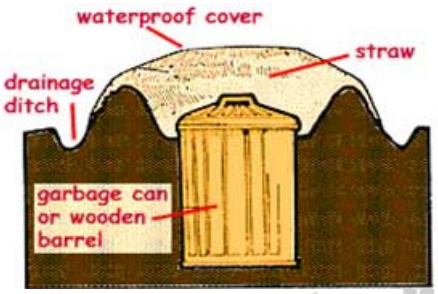
The **Storage Environment and Packaging** for just about everything has just about the same requirements and is equally important to a product/item shelf life. I don't care if it's a pair of jeans, food, or aspirin, vacuum sealed or not, tires, carpets, or what have you - **Shelf life is *extremely dependent* on the following storage conditions:**

- **Air tight.** This keeps additional contaminants out and helps maintain the low oxygen level of the stored product.
- **Low oxygen.** The oxygen in air can have deteriorative effects on fats, food colors, vitamins, flavors, and other food constituents. It can cause conditions that will enhance the growth of microorganisms.
- **Low to no light.** The exposure of foods to light can result in the deterioration of specific food constituents, such as fats, proteins, and vitamins, resulting in discoloration, off-flavors, and vitamin loss. For materials such as fabrics, rubber, vinyl and the like direct sunlight breaks down the material at an accelerated rate.
- **Low to no humidity and water tight.** Excessive moisture can result in product deterioration and spoilage by creating an environment in which microorganisms may grow and chemical reactions can take place. Metals rust and breakdown, vinyl and plastics off-gas faster.
- **Consistently cool** (below 75 degrees, above 45 degrees), with less than a 10 degree temperature change every 20 hours. Excessive temperature is damaging to food storage. With increased temperature, proteins breakdown and some vitamins will be destroyed. The color, flavor and odor of some products may also be affected. To enhance shelf life, store food at room temperature or below; never store food in an attic or garage unless it is temperature controlled. The chemicals in cleaning products can break down and may turn gaseous and dangerous. Fabrics, plastics and rubber off-gas faster at higher temperatures. The more off-gassing, the faster the material deteriorates.
- **Is as insect and rodent proof/free as possible.** Remember rodents can and will chew through plastic if they can smell the item inside and want it.

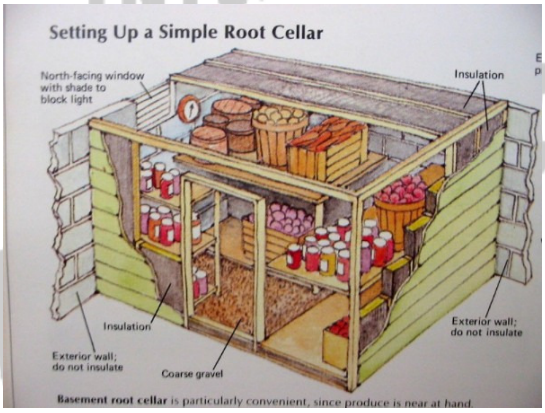

Where medications, OTC (over the counter) and prescriptions, are concerned this means that the bathroom is probably the worst possible place to store these items. As it's way too humid and usually much warmer than

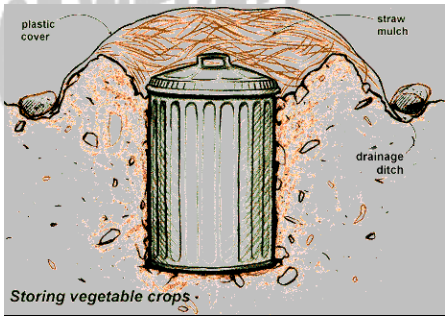
other parts of the house. Some medications, like insulin, need to be refrigerated so they stay cooler than 70 degrees.

"The wise store up choice food and olive oil, but fools gulp theirs down."
Proverbs 21:20



As stated above, we need a proper place to store our preparation supplies, no matter what they are. There are several traditional methods to preserving food and building a root cellar, that won't cost the shirt off our backs! Root Cellars are a great place to store just about all of our preparation supplies, so if you can build your own or create several small trash can type "root cellars" for your supplies you will be ahead of the game.





Food Preservation

In order to store food, you have get food and then preserve it. There are several methods available today; some traditional, so not so much. Some produce better shelf-lives than others do, while some build or keep nutrients and others lose them.

The method used to preserve food plays an important role in the "shelf-life" of that food item. There is curing, either with smoke, salt or sugar. There is dehydrating and freeze drying, on top of the old standbys of refrigeration, freezing and canning, either hot or cold or pressurized. Generally speaking the freeze drying method has the longest shelf life and covers the widest variety of foods.

The major methods available to us today are listed below with their pro's and con's:

Method	Advantage	Disadvantage
Canning, Hot Water Bath	Destroys microorganisms & autolytic enzymes.	Water-soluble nutrients can be lost into liquid in can.

Method	Advantage	Disadvantage
	Inexpensive Can be done at home Best for fruits and vegetables that have a high acid content	Not recommended for meats or dairy. May need to add vinegar or lemon juice to up the acid level. Requires fuel to create the heat
Canning, Pressurized Hot Water (steam)	Destroys microorganisms & autolytic enzymes. Inexpensive Can be done at home Best for meats and dairy, including fish and game.	Water-soluble nutrients can be lost into liquid in can. Requires fuel to create the heat
Chemical preservatives	Prevent microbial growth No loss of nutrient. Can be inexpensive Can be done at home for many foods with vinegar or lemon juice	Some people are sensitive to some chemical preservatives. Some chemical preservatives are questionable.
Curing with Added Salt or Sugar	Makes water unavailable for microbial growth. Process does not destroy nutrients. Inexpensive Can be done at home Great for meat, poultry, fish and game Best if coupled with smoking	Increases salt and sugar content of food.
Curing with Smoke	Preserve partly by drying, partly by incorporation of substances from smoke. Inexpensive Can be done at home Great for meat, poultry, fish and game Best if coupled with some type of salt or sugar curing	Eating a lot of smoked foods has been linked with some cancers in some parts of the world.
Drying/Dehydration (e.g. freeze-drying, spray-drying, sun-drying)	Produces concentrated form of food. Inhibits microbial growth & autolytic enzymes. Retains most nutrients. Inexpensive Can be done at home Does not require electricity	Can cause loss of some nutrients, particularly thiamin & vitamin C. Sulphur dioxide is sometimes added to dried fruits to retain vitamin C, but some individuals are sensitive to this substance.

Method	Advantage	Disadvantage
Fermentation	Preserves nutrients and creates digestive aids, such as probiotic bacteria Higher level of acid which is inhospitable for the spoilage bacteria Helps break down proteins and make it more digestible to people with intollerances (lactose, soy, etc). Think cheeses and yogurt, bread, pickles, sauerkraut, chocolate, beer, coffee, wine and a whole host of cured meats. Inexpensive Can be done at home	More steps to process; foods must first be heated and pasteurized before the fermentation so that many nutrients are lost More time
Freeze Drying (lyophilization)	Prevent microbial growth Preserves flavor and essential vitamins Once the water is removed from foods, they become very light Can last for months to decades (unless not stored at low humidity levels or exposed to excessive heat) Fast rehydration process Retains most of it original bulk with minimal shrinkage	Requires special equipment Costly, more expensive than dehydrated food or canned goods Cannot be done at home cost effectively ie must be purchased Requires electricity
Freezing	Prevents microbial growth by low temperature & unavailability of water. Generally good retention of nutrients. Can be done at home	Blanching of vegetables prior to freezing causes loss of some B-Group vitamins and vitamin C. Unintended thawing can reduce product quality Requires electricity
High heat processing (e.g. pasteurisation)	Inactivates autolytic enzymes Destroys microorganisms. Inexpensive Can be done at home	Loss of heat-sensitive nutrients. Requires fuel to create the heat.
Ionizing radiation	Sterilizes foods (such as spices) whose flavor would change with heating. Inhibits sprouting potatoes Extends shelf life of strawberries and mushrooms	Requires special equipment Longer shelf life of fresh foods can lead to greater nutrient losses than if eaten sooner after harvesting. Costly Potential health risks Cannot be done at home
Refrigeration	Slows microbial multiplication. Slows autolysis by enzymes	Slow loss of some nutrients with time Requires electricity

Method	Advantage	Disadvantage
	Can be done at home	

To be able to have the most variety and the best nutritional value in your food store, one must rotate these items (ie: utilize and replace) them. To do this and still have some long shelf lives, it pays to store individual ingredients, utilizing different preservation methods for the same ingredient.

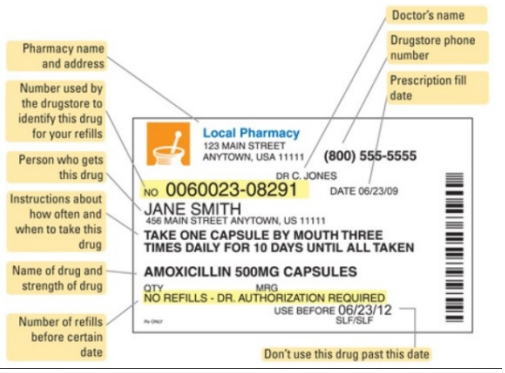
What about all those various dates on food and medications and what role do they play in shelf-life?

Some of these dates are required or standardized by the FDA or USDA, however many are not.

To add to this general confusion, according to the USDA Food Safety and Inspection Service (FISA) and the Food Marketing Institute there are **two kinds of product dating**:

USDA Food Safety and Inspection Service (FISA)	Food Marketing Institute
"**Closed or Coded Dates**" are packing numbers for use by the manufacturer.	"**Closed or Coded Dates**" - packing numbers for use by the manufacturer in tracking their products. This enables manufacturers to rotate their stock as well as locate their products in the event of a recall.
"**Open Dating**" (use of a calendar date as opposed to a code) on a food product is a date stamped on a product's package to help the store determine how long to display the product for sale. It can also help the purchaser to know the time limit to purchase or use the product at its best quality. It is not a safety date.	"**Open Dating**" on a food product refers to an actual calendar date instead of a coded date. This type of date is found mainly on perishable foods such as meat, poultry, eggs and dairy products. It helps the store to know when to pull these foods off the shelf. It can also benefit consumers to help determine when a product is at its best quality. It is not a safety date.

"No man who is not willing to help himself
has any right to apply to his friends, or to the gods."
Demosthenes



Understand that not *all* products carry *all* the dates and not *all* dates are required or standardized. In fact:

- Stores are not legally required to remove food from the shelf once the expiration date has passed. In fact the FDA states "*To explain, FDA's regulations pertain, among other things, to food safety. The quality characteristics of foods (taste, aroma and appearance--as distinct from safety characteristics) often depend in great part on good storage conditions: temperature and humidity control in the retail store and warehouse. When storage conditions have been optimal, many foods are acceptable in terms of taste and other quality characteristics for periods of time beyond the expiration date printed on the label, and also are safe to eat. Taste and other quality characteristics deteriorate more rapidly if the food is stored at elevated temperatures and high humidity conditions (such as would occur if the air conditioning failed in a retail store, warehouse, or in the consumer's home). Conversely, deterioration occurs very slowly if foods are stored under optimal conditions (correct storage temperatures and low humidity). Because the expiration date is not indicative of product quality if storage conditions have been less than optimal, FDA does not require expiration dates on most products. An exception to this answer is that expiration dates are required on drugs. The dates required on infant formula products are "use by" dates, not "expiration" dates. A consumer using the infant formula product before this date is assured that the product meets nutritional and quality standards.*" This means the expiration dates are strictly "advisory" in nature and not the items true Shelf Life.
- It is also legal for a retailer to change a date on "wholesome" fresh meat that has been cut and wrapped in the meat department of the store. However, retailers cannot change dates on products packaged under federal inspection. If a food is not handled properly, it can become a health hazard regardless of the date code.
- Dating is not federally required, except for infant formula and baby food.
- States have their own food dating laws and they vary from state to state. For example, many states require that milk and other perishables be sold before the expiration date, while others do not.
- There is no uniform or universally accepted system used for food dating in the United States. Although dating of some foods is required by more than 20 states, there are areas of the country where much of the food supply has some type of open date and other areas where almost no food is dated.

Labeling Dates:

- A "**Sell-By**" date tells the store how long to display the product for sale. You should buy the product before the date expires.

- A "**Pull-by Date**", is basically the same as a "Sell-by Date" is used by manufacturers to tell grocers when to remove their product from the shelves, but there is generally still some leeway for home usage. For example, milk often has a sell-by date, but the milk will usually still be good for at least a week beyond that date if properly refrigerated.

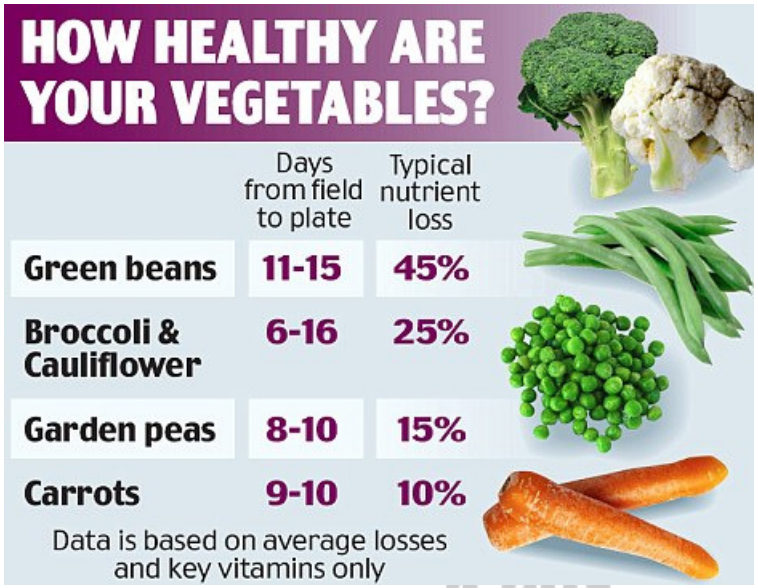
- A "**Use-By**" or "**Best if Used By** (or **Before**)" date is the last date recommended for the use of the product while at peak flavor or quality. The date has been determined by the manufacturer of the product.

- "**Expiration Date**" or "**Expiry Date**" means the calendar date on the packaging of a pharmaceutical or food that indicates the last date the item should be used. Basically if you haven't used it by this date toss it. The Food and Drug Administration (FDA) requires pharmaceutical manufacturers to provide this date on all their products. For the majority of drugs sold in the United States, these dates range from 12 to 60 months from the date they are manufactured. **Note:** *Per Federal Regulations, if a pharmaceutical has an Expiry Date of January 30, 2015 but was dispensed as a patient prescription fill on June 10, 2013, then the Expiry Date automatically becomes 1 year after the prescription date or June 10, 2014.*

Two other dates you might see are:

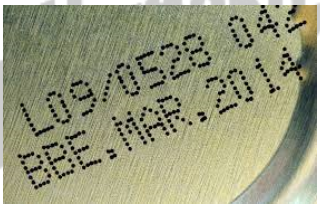
- A "**Pack Date**" is the date the item was packed, most-used on canned and boxed goods. It is usually in the form of an encrypted code not easy to decipher. It may be coded by month (M), day (D), and year (Y), such as YYMMDD or MMDDYY. Or it may be coded using Julian (JJJ) numbers, where January 1 would be 001 and December 31 would be 365. In even more convoluted coding, letters A through M (omitting the letter I) are often assigned to the months, with A being January and M being December, plus a numeric day, either preceded or followed by the numeric year.

- The "**Guaranteed Fresh Date**" is often used for perishable baked goods. Beyond this date, freshness is no longer guaranteed although it may still be edible.



And of course the UPC or Bar Code:

Universal Product Codes appear on packages as black lines of varying widths above a series of numbers. They are not required by regulation but manufacturers print them on most product labels because scanners at supermarkets can "read" them quickly to record the price at checkout. Bar codes are used by stores and manufacturers for inventory purposes and marketing information. When read by a computer, they can reveal such specific information as the manufacturer's name, product name, size of product and price. The numbers are not used to identify recalled products.



The USDA/FSIS and or FDA has this to say about *expiration date safety* for specific food products:

Use-by or Expiration Date Safety

Except for "use-by" dates, product dates don't always pertain to home storage and use after purchase. "Use-by" dates usually refer to best quality and are not safety dates. Even if the date expires during home storage, a product should be safe, wholesome and of good quality if handled properly. If product has a "use-by" date, follow that date. If product has a "sell-by" date or no date, cook or freeze the product according to the times on the FSIS chart.

Foods can develop an off odor, flavor or appearance due to spoilage bacteria. If a food has developed such characteristics, you should not use it for quality reasons.

If foods are mishandled, however, foodborne bacteria can grow and, if pathogens are present, cause foodborne illness — before or after the date on the package.

Canned Goods

Canned goods typically have an Expiration Date.

Low-acid canned foods such as vegetables like peas or carrots can last anywhere from two to five years. High acid canned foods such as citrus fruits, pickles, or tomatoes can last 12 to 18 months. Make sure to store your cans in the dark, because light can accelerate natural chemical reactions. If your can is bulging or has a dent, throw it out, as this may be a sign of food-borne illness.

What do Can Codes mean?

Cans must exhibit a packing code to enable tracking of the product in interstate commerce. This enables manufacturers to rotate their stock as well as to locate their products in the event of a recall.
These codes, which appear as a series of letters and/or numbers, might refer to the date or time of manufacture. They aren't meant for the consumer to interpret as "use-by" dates. There is no book or Web site that tells how to translate the codes into dates.

Cans may also display "open" or calendar dates. Usually these are "best if used by" dates for peak quality.

Dairy and Eggs

Dairy and eggs typically have a Sell-By Date

Proper refrigeration (40° F or below) is vital to ensure the best possible shelf life of your dairy products.

According to the Dairy Council of California, the shelf life of milk is affected by several factors, including how it is handled before and after it is purchased. When stored at 40 degrees Fahrenheit and not left out of the refrigerator for extended time periods, milk should last approximately five to seven days past the "sell by" date."

The type of cheese contributes to its shelf life. Soft cheese (cream cheese) will last up to two weeks, whereas a medium or hard cheese (cheddar) can last three to six months.

Use of either a "Sell-By" or "Expiration" (EXP) date is not federally required, but may be State required, as defined by the egg laws in the State where the eggs are marketed. Some State egg laws do not allow the use of a "sell-by" date.

The Egg Safety Center reports that the dates on egg cartons are not food expiration dates, but guidelines. Raw eggs can stay good for approximately 3 to 5 weeks after the date of purchase as long as they are not cracked or damaged.

Many eggs reach stores only a few days after the hen lays them. Egg cartons with the USDA grade shield on them must display the "pack date" (the day that the eggs were washed, graded, and placed in the carton). The number is a three-digit code that represents the consecutive day of the year starting with January 1 as 001 and ending with December 31 as 365. When a "sell-by" date appears on a carton bearing the USDA grade shield, the code date may not exceed 45 days from the date of pack.

Always purchase eggs before the "Sell-By" or "EXP" date on the carton. After the eggs reach home, refrigerate the eggs in their original carton and place them in the coldest part of the refrigerator, not in the door. For best quality, use eggs within 3 to 5 weeks of the date you purchase them. The "sell-by" date will usually expire during that length of time, but the eggs are perfectly safe to use.

Using mineral oil to coat fresh eggs and then store in a cool, dry, dark place is a method that has been in use for centuries and is often used by Preppers and people that just want to save some money on their grocery bills.

Pickling eggs is another decades old method of preserving them.

Dating Infant Formula

Federal regulations require a "use-by" date on the product label of infant formula under FDA inspection. If consumed by that date, the formula or food must contain not less than the quantity of each nutrient as described on the label. Formula must maintain an acceptable quality to pass through an ordinary bottle nipple. If stored too long, formula can separate and clog the nipple.

The "use-by" date is selected by the manufacturer, packer or distributor of the product on the basis of product analysis throughout its shelf life, tests, or other information. It is also based on the conditions of handling, storage, preparation, and use printed on the label. Do not buy or use baby formula after its "use-by" date.

Poultry and Meat

Meat and poultry typically have a Sell-By date. You should use or freeze your chicken within one to two days of purchasing and meat within three to five days of purchasing. Freezing your poultry and meat can make these proteins last anywhere from nine to 12 months. When freezing, it is important to make sure your poultry and meat is tightly wrapped in order to prevent it from freezer burn. Freezer burn does not make food dangerous to eat, but does damage the texture and taste.

Baked Goods and Snack Foods

Baked goods and snacks typically have a Use-By Date.

Store-bought bread will typically last five to seven days at room temperature, but can last one to two weeks in the refrigerator. Fresh-baked bread do not contain preservatives, so they typically won't keep as long as commercially packaged breads.

If the date on your bread or snacks has expired, it does not mean they have not gone bad. In fact, once something goes stale it means that it has been depleted of moisture, which makes it less likely to grow mold. Try storing it in a plastic bag for extended shelf life.

Snack foods contain preservatives in order to maintain shelf life.

Different types of snacks have varying expiration dates: Potato chips will last one month after expiration date. Crackers and pretzels can last up to three months. One of the longest lasting snacks is popcorn, which has a shelf life of one to two years.

There is a myth that Twinkies can last upward of 50 years. However, this is urban legend. Twinkies can last for a lengthy 25 days without packaging, because dairy products are not a part of the recipe. After 25 days, a Twinkie does not spoil, but loses some of its taste and flavor.

Beverages

Beverages typically have Use-By dates.

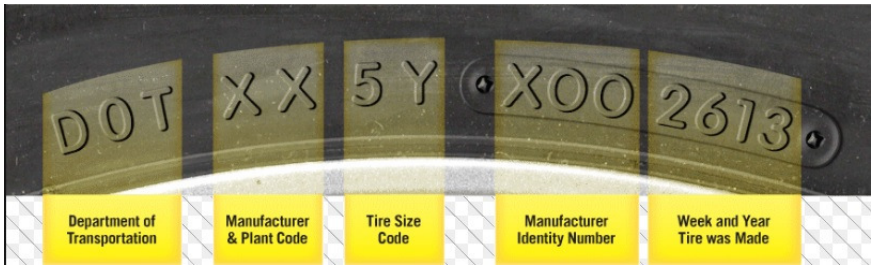
Many water bottles have a two-year Use-By date printed on them. However, as long as the bottle stays unopened it is safe to drink. Bottled water does not contain nutrients, so the pathogens that cause food-borne illness can't grow. Once a bottle of water has been opened it should not be kept for more than two weeks.

Soda has a storage time of three months, after that the color and flavor might change but the beverage will be safe for consumption.

To be sure your food is not spoiled if no date is posted, use common sense:

Trust your nose and eyes. If it looks or smells funny, throw it out. If you see mold, it's too old. Many people cut off the moldy piece of fruit or bread and believe it is then safe to eat. However, molds are filamentous (threadlike) and when a food shows mold growth on the surface it means that the root like threads have invaded the entire food. Mold can cause allergic reactions, respiratory problems, and the mycotoxins they produce can make you sick.

(Mycotoxins are secondary metabolites produced by microfungi that are capable of causing disease and death in humans and other animals.)



Most self-reliant folks think about food or medications when discussing shelf-life. However, *service life*, *shelf-life or viability life* applies to clothing, bedding, building structures, transportation, farming, ranching, appliances and various infrastructure (home and community) systems too.

Back in 2010 I completed about a years' worth of research on the shelf of various food and drug products. As a result of thinking about long duration crises, I have just recently completed additional research to see if anything has changed and added a few items that one might not normally think about, like vehicles, tools, etc. I've also added: beauty or personal care products, fuel, household electronics, household appliances, as well as the life expectancy of common components inside a home — everything from appliances, cabinetry, and flooring… to roofing, plumbing, and HVAC systems (according to a 2007 National Association of Home Builders (NAHB) study).

I still don't have much listed for clothing (textiles) as the kind of material, how it was worn, how it is stored and how often it is washed - all play a significant role in how long the article of clothing will last. The same holds true for shoes and boots.

> For instance, raw denim is more durable than pre-washed or other denims. Levi Strauss', raw denim bib overalls, when washed no more than once every 6 months, have been known to last for decades.

When it comes to footwear, well is it leather? The less leather to the shoe, the shorter the life span and generally the less repairable the shoe or boot is. So the quality of the leather (not fashion quality-durability quality) and care of the shoe/boot will determine how long the pair will last.

The LL Bean work boot and Wellington boots have been known to last for several generations of farmers and ranchers and still be hanging in there effectively.

One area that is almost identical to food shelf-life and storage is the; low light, low moisture, low insect/rodent influence, with moderate temperatures in an air tight container, requirement to longevity. Yep, just about any fabric, leather, thread or yarn will last longer than not having those things under control.

Okie dokie, got all the dates straight now? If you're like me the answer is "maybe, kinda, sorta'!

"A prudent person foresees the danger ahead and takes precautions.
The simpleton goes blindly on and suffers the consequences."
Proverbs 27:12

Why is this important?

Well aside from wanting to eat great tasting food, we want it to be nutritional and safe to eat too. When it comes to any emergency clothing and footwear or tools, we want to be sure they are still of functional quality. If we are living a self-reliant life or planning to in the near future, we need to know just how long the average tool, appliance, vehicle will last before we have to replace it … Or how about how long before that well pump, solar panel or wind turbine needs to be replaced … Or how long before various parts of our home will need major repairs or replacement. These are all important

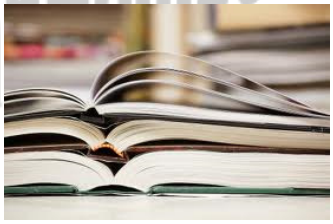
factors that any seeker of self-reliance or preparedness must consider to be truly "prepared for the worst".

We have only a few choices here:

- Be prepared for the worst
- Expect someone or something else to "fix" this for us
- Pray for a miracle that nothing will break or wear out

So let's get on to my research for the Shelf-Life Excel Workbook …

In 2010 and now, for all food items, I've relied heavily on the Brigham Young University's Long-Term Food Storage Studies, as they are the most detailed, quantified and longest running studies to date in the world. (Their tests take into consideration the food preservation method, the packaging method and material, as well as the storage environment at different temps and humidity readings; on top of opened and unopened. The grade the look, feel, taste, contaminants, as well as microbiological growth and nutritional value. They have entire degree programs on this stuff!.) In fact many countries and governments, including our own military, turn to these studies for guidance.



Some of the new research had some interesting results, especially where food is concerned, so I went back to the original source to see if they changed anything. As a result you might find the same source for the same product listed twice, with two different shelf-life dates. However, most dates have not and these original sources had scientific research (full-fledged and quantified) to back them up.

In one of BYU's studies of *Basic Food Storage and Its Nutritional Value* they concluded:

> "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."

Important Notes:

- For food you will note that the cooking, manufacturing and government resources have a shorter shelf-life than the nutritional study (quantified) resources. As for why this is; my guess is that chefs have a certain "performance expectation", manufacturers just want to sell product and make money and the government wants everyone reliant on them for guidance and also to help manufacturers stay in business.

- For items like jeans, shirts and footwear, what the item was made for vs. how it was used to how long between washings and how it was stored or folded or hung up ALL play a role in how long the item will last. American's are rather "wash happy", as a result our clothing and footwear has a shelf life that is half that of most European countries for the exact same item.

- For medications the dates vary depending on if it the expiration is from the manufacturer, liability lawyers or the results from one of a handful of independent studies. One thing to remember is that once the manufacturer's bottle is opened to fill a patient prescription, the expiration date is automatically 1 year after the prescription fill date. The reason for this is simple: The active ingredients in medications have very specific storage needs before they start to change or break down and become either unstable, ineffective or outright deadly and that is on top of the fact that they are produced under very sterile conditions. So I can understand why these dates are rather short since we the public are the big variable as to how the medication is stored and used.

  For more information on medication, vitamin and supplement dates see *Staying Healthy Without the Healthcare Infrastructure* @ http://formerlynmurbanhomesteader.weebly.com/uploads/2/2/5/0/22509786/staying_healthy_without_the_healthcare_infrastructure.pdf



- For things like fuel, a manufacturers life expectancy dates are longer than independent research groups; they also tend to have less "criteria" for their shelf life estimates. The reason for this is a guess at best; I believe it is because the independent resources are storing this "test" fuel in a more realistic manor and the fuel manufacturers expect us to be much more trusting of their product than is warranted.

  For more details on fuels, their storage needs and life expectancy see *Fuels and Fuel Storage, the Short and Long of It* @ http://formerlynmurbanhomesteader.weebly.com/uploads/2/2/5/0/22509786/fuels_and_fuel_storage_the_short_and_long_of_it_new_site.pdf

This means that ALL of these items/products, from ALL of the resources listed, have various caveats or requirements associated to them, beyond the basic storage needs, in order to have maximum shelf/stability life.

Examples:

Fuel today, from diesel and gasoline to heating oil and kerosene, are generally manufactured *by region* and have additives in them based on the *season* in which they will be sold. Literally you can purchase gasoline in the summer in a city, store it correctly, yet when you go to use it in the same city during the winter time, it will not perform as well – or vice versa.

According to the Canned Food Alliance July 2014:

"Canned food has a shelf life of at least two years from the date of processing. *Canned food retains its safety and nutritional value well beyond two years*, but it may have some variation in quality, such as a change of color and texture.

Canning is a high-heat process that renders the food commercially sterile. Food safety is not an issue in products kept on the shelf or in the pantry for long periods of time. In fact, canned food has an almost indefinite shelf life at moderate temperatures (75° F and below)."

In a 1978 Canned Food Alliance report:

Canned foods are safe indefinitely as long as they are not exposed to freezing temperatures, or temperatures above 90 °F (32.2° C). If the cans look ok, they are safe to use. Discard cans that are dented, rusted, or swollen. High-acid canned foods (tomatoes, fruits) will keep their best quality for 12 to 18 months; low-acid canned foods (meats, vegetables) for 2 to 5 years.

In an **old FDA Consumer magazine article called "The Canning Process: Old Preservation Technique Goes Modern" by Dale Blumenthal** (http://web.archive.org/web/20070509153848/http:/www.fda.gov/bbs/topics/CONSUMER/CON00043.html), stated:

> "The steamboat Bertrand was heavily laden with provisions when it set out on the Missouri River in 1865, destined for the gold mining camps in Fort Benton, Mont. The boat snagged and swamped under the weight, sinking to the bottom of the river. It was found a century later, under 30 feet of silt a little north of Omaha, Neb.
>
> Among the canned food items retrieved from the Bertrand in 1968 were brandied peaches, oysters, plum tomatoes, honey, and mixed vegetables. In 1974, chemists at the National Food Processors Association (NFPA) analyzed the products for bacterial contamination and nutrient value. Although the food had lost its fresh smell and appearance, the NFPA chemists detected no microbial growth and determined that the foods were as safe to eat as they had been when canned more than 100 years earlier.
>
> The nutrient values varied depending upon the product and nutrient. NFPA chemists Janet Dudek and Edgar Elkins report that significant amounts of vitamins C and A were lost. But protein levels remained high, and all calcium values "were comparable to today's products.""
>
> The article went on to state that "NFPA chemists also analyzed a 40-year-old can of corn found in the basement of a home in California. Again, the canning process had kept the corn safe from contaminants and from much nutrient loss. In addition, Dudek says, the kernels looked and smelled like recently canned corn."

This is very encouraging news to most of us Preppers with a long duration crisis on our lists! However something has changed over the decades and the reasons are sources of debate worldwide. *The biggest change noted by this FDA article is that modern commercial canned goods do NOT fair as well.* Oh, they are often free of microbial growth and won't kill us, however they seem to lose most of their nutritional value in the first 2 - 3 years.

Yet according to nutritional shelf-life studies done at BYU:

> "Canned foods, home or commercial, retain their nutritional values for 2-3 years when optimally stored."

In another BUY study on dry foods:

> In one study by the Department of Nutrition, Dietetics and Food Science at BYU, on long-term storage of food. They have collected samples of dry food stored in No. 10 cans for up to 30 years at room temperature or cooler. They tested the following products: powdered milk, rice, baking powder, instant potatoes, dried apples, all-purpose flour, pasta, pinto beans, wheat and powdered eggs.
>
> From this study, they concluded that if properly packaged and stored, all of these foods store fairly well, except for the powdered eggs. In general, the vitamins they measured (thiamin, riboflavin, vitamin C, vitamin E) in properly stored foods are fairly stable over time.

The Excel Workbook has three (3) tabs. The first contains the food and medication shelf life information; the second tab contains the life expectancy of all kinds of other things and the third tab contains a list of resources.

My workbook can be found @
http://formerlynmurbanhomesteader.weebly.com/uploads/2/2/5/0/22509786/shelf_life_information_on_lots_of_things_updated_july_2014.xlsx

TNT

"Without self-reliance, there is no independence.
Without independence there is no freedom.
Without freedom, there is no self."
Anonymous