

Inexpensive, Non-Refrigerated Egg Storage

By: Blackhawk

Protein is one of the most vital components of the human diet, especially during periods of heavy physical labor. While sufficient amounts of all the different amino acids (protein's building blocks) can be acquired through a totally vegetarian (or vegan) diet, the job is much simpler if sources of animal protein are included in the diet. The classic porterhouse steak isn't the only choice for adding animal protein to your diet. The white settlers of North America found that eggs were a vital resource and an efficient source of animal protein. Unfortunately, without energy-intensive methods, mainly lots of extra light, hens produce relatively few eggs during the winter. And without other energy intensive methods, mainly mechanical refrigeration, eggs are difficult to store for more than a few days to a short number of weeks. This article reports on my ongoing experiment in storing eggs cheaply without mechanical refrigeration.

Many storage methods are mentioned in 19th and early 20th century sources. There was, for a few weeks in 1997, a lively discussion on the misc.survivalism newsgroup. One source mentioned was the book *Scientific American Cyclopedia of Formulas* copyright 1910 by Nunn & Co., Inc. {Due to the age of this book and the state of technology when it was printed, this writer makes no assurances as to the suitability or safety of the following information. Use of the following information is at your own risk!!} One condensation of methods comes from a set of experiments made by Director Strauch, of the Agricultural School, in Neisse (Germany), with various methods for keeping eggs fresh. At the beginning of July (the year was not given) 20 fresh eggs were treated by the same method, and examined at the end of February (an 8-month test). The results are given below:

- o Kept in brine: all unfit for use; not decayed, but unpalatable from being saturated with salt.
- o Wrapped in paper: 80% spoiled.
- o Kept in a solution of salicylic acid and glycerin: 80% spoiled.
- o Rubbed with salt: 70% spoiled.
- o Packed in bran: 70% spoiled.
- o Coated with paraffin: 70% spoiled.
- o Painted with a solution of salicylic acid and glycerin: 70% spoiled.
- o Immersed in boiling water 12 - 15 sec.: 50% spoiled.
- o Treated with solution of Alum: 50% spoiled.
- o Kept in a solution of salicylic acid: 50% spoiled.
- o Coated with soluble glass: 40% spoiled.
- o Coated with collodian: 40% spoiled.
- o Coated with varnish: 40% spoiled.
- o Rubbed with bacon: 30% spoiled.
- o Packed in wood ashes: 20% spoiled.
- o Treated with boric acid and soluble glass : 20% spoiled.
- o Treated with Potassium permanganate: 20% spoiled.
- o Coated with Vaseline and kept in lime water: all good.
- o Kept in soluble glass: all very good.

The lime water and soluble glass methods' high success rates interested me immediately. Soluble glass is another name for sodium silicate, also called water glass in many sources. You can buy sodium silicate from the pharmacy and use 1:9 ratio. (1 part sodium silicate to 9 parts water). Many commercial egg storage preparations available today are based on this chemical. All are much more expensive than pickling lime, the key ingredient in limewater. Being frugal (the word 'tightwad' is used just out of my hearing quite a bit) I decided to try the cheap method first.

For best results, the eggs should be 2 to 3 hours old. The eggs should NOT be washed.

(If dirty, brush them clean.) Washing them destroys the natural film on the egg, which seals the pores of the eggs. Use only clean, uncracked, smooth eggs (No rough spots). Any clean 2 to 3 Gallon wide mouth container can be used. Jars, crocks, bucket. Smaller containers makes for easier use of old eggs first. If using eggs from a market, one way to see if the eggs are fresh is to submerge them in water. (They have already been washed.) If they sink to the bottom and remain there, they are fresh. If they float to the top, they have already begun the oxidation process.

Further research on limewater recipes led me to try the following recipe, which produces about 1 gallon of liquid for approx. 4 dozen eggs:

Add 2# pickling lime and 1 C salt to 1 qt boiling water. Add 2-1/2 qts of tapwater.

Cool. Place eggs in mixture. Keep covered in liquid with weighted lid. (There is an alternate recipe further down). Keep in cool place, but don't allow to freeze.

In Feb 2002 I used that recipe to store 4 dozen eggs from a friend's flock in a 2-gallon plastic bucket in our basement. Since the eggs were prepared for commercial sale, they had been washed and refrigerated for 2 days before I bought them. The 1 gallon of liquid produced by the above recipe was enough with a small bit to spare to cover the 4 dozen eggs. (Place raw eggs CAREFULLY into the container.) The bucket sits in a corner of the most-used part of our unfinished basement. I use a plastic disk weighted with a piece of brick to keep the eggs submerged. I have eaten 2-4 eggs each month from the bucket with no noticeable ill effects. My observations include:

- After 3 months the whites were pretty watery. I'm probably out of the meringue business by now, (but if you're worried about meringue, things aren't bad enough to be interesting yet).
- After 4 months the yolks were tender (easily broken) enough that fried eggs are an uncertain proposition. Again, not a vital concern in a survival situation.
- I found my first 'bad' egg in Oct (after 8 months in storage). The white was yellowish, the yolk was like jelly, and there was a very slight earthy odor to the egg. I did not cook nor try to eat it. The shell had a noticeable rough spot about 1/4 inch in diameter. The other three removed at that time were perfectly fine and tasted great. My egg supplier said he'd seen eggs only a few days old, which exhibited those characteristics. He said he'd read a report, which stated that bacteria enter the egg through the rough spot on the shell and ruin the egg within hours. This reemphasizes the need to carefully screen all items for long term storage before placing them in storage.

- Just did my Nov (9 month) test. All four eggs fine. All four whites slightly yellowish. All yolks very tender. One broke when the egg was cracked. All tasted fine.
- With the one exception in October all eggs have smelled and tasted fine. I have noted no off odors or flavors. Specifically I have never noted the 'limey' taste some sources reported as common for eggs stored in this manner.

The temperature of the liquid (a decent measure of average basement temperature) has ranged from 55 degree F in Feb to 63 degrees F in Aug. This is expected of basement temperatures in our area of eastern TN.

I plan to continue this experiment until the eggs run out or become unusable. Were I to do this again I would consider the following changes:

- Coat some eggs with Vaseline to see if it makes any difference in the long run.
- Don't start eating the eggs until 5-6 months have passed to allow the experiment to run longer.
- Change the recipe to use less lime. There is no chemical reason for the excess (undissolved) lime in the recipe. A solution with a slight excess of lime (demonstrated by a slight cloudiness of the solution) should be just as good as the slurry (extreme excess of solid material) produced by the recipe I used. I discovered a recipe on the Juniper Farm website which uses 2# of lime in 5 gallons of water vs the 1 gallon I used. (See recipe below) I would probably use a recipe close to this. You need to produce a liquid, which is slightly cloudy from excess lime, but not as hard to see through as milk (See notes).
- Clearly this storage method works well. My current finding of 7 months with no discernible reduction in edibility (8 months if the one egg was bad to begin with) provides me with a way to store excess summer eggs through the winter as a protein source in an emergency.

These eggs can be preserved for 2 years with this method. It is said that the whites become a little watery but still can be used for anything except meringue and the like.

The following recipe is provided courtesy of Juniper Creek Farm

The limewater has to be prepared first as it has to stand for awhile.

To make the solution, measure 5 gallons of water and bring it to a boil. Remove from heat then add two pounds of fresh lime or dehydrated lime, and stir this almost constantly as the water cools. Dissolve as much lime as possible. To make less liquid, use 16 parts water, 2 parts lime, 1 part salt.

Now set the mixture aside and let stand, undisturbed, until all the undissolved lime has settled to the bottom and only clear liquid remains on top. It is only this clear liquid which is to be used...

The crock, which you will be using, should be very clean. Siphon the clear liquid into the crock you will be using, taking much care not to disturb the sediment on the bottom. Now carefully

pack the eggs as closely as possible into the crock in the lime solution. Be sure that all the eggs are immersed.

If the crock does not have a tight fitting lid, cover the surface of the solution with melted paraffin. This is to prevent the liquid from evaporating.

Store in a cool place.

(Notes)

The use of a crock with a tight fitting lid or melted paraffin is not really needed. If evaporation is noted, just add a little tap water to the container. Using a loose lid creates a skim of lime crystals forming on the top of the solution, which effectively stops additional evaporation.

If desired, use of a plastic bucket with a gamma lid is great for accessibility and creates a sealed effect, but gamma lids are expensive. You still need something to make sure that the eggs remain completely covered with liquid.

To use the recipe from the Juniper Creek Farm web site, You do not need to bring all 5 gallons to a boil. Bring half the water (2 ½ gal) to a boil, add the lime and stir for a bit. Add the rest of the water at room temperature. You shouldn't have to stir constantly as it cools. Stirring occasionally (every 20 to 30 minutes) would be some help in making sure you end up with a saturated solution, but even that isn't critical. Use the same proportions of water if making less liquid.

When adding the liquid to the container that will house the eggs, it is not critical to siphon only the clear liquid. Having some excess lime is useful if more water is eventually added. Excess lime doesn't hurt and it doesn't really help.

The undissolved lime that settles to the bottom may be used for further batches.

1 gallon of liquid covers approximately 4 dozen eggs. Making 5 gallons of liquid, as provided by the Juniper Creek Farm recipe, will cover approximately 20 to 25 dozen eggs