Preserving Your Fresh Vegetables through Fermentation

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Having out-of-season food year round

Everything old is new again. And fermentation, one of the oldest forms of food preservation, is "new" again.

Food preservation is about survival…having food year around and out of season. Lacto-fermentation can be traced back several thousand years. Sauerkraut has been found in the diets of workers building the Great Wall of China. Because of its high vitamin C content, sauerkraut was a staple to ward off scurvy by sailors on ships. Marco Polo brought it to the Western world as a means of feeding his expeditions.

Lacto-fermentation is a microbial process that uses beneficial bacteria (*Lactobacillus* and *Bifidobacterium* spp. and other lactic acid bacteria (LAB) (commonly known as probiotics), that thrive in an anaerobic fermenting environment.

Lacto-fermentation is what turns cucumbers into pickles and raw cabbage into sauerkraut using only naturally occurring microbes. Vegetables are naturally covered in many kinds of microorganisms. Some are beneficial, the good kind, and some are pathogens, ones that can cause disease. All are held in check while the plant is growing. But once the plant is harvested, it's a race against time as these microbes grow on any place the plant is cut, damaged or bruised. It is important that the vegetables be washed well and kept cold to retard such growth. Do not use anti-microbial soaps on the vegetables or your hands. You don't want to kill the good guys.

Fermentation preserves vegetables raw and without heat so it retains the vitamins, minerals and enzymes, and actually enhances them. In a 2005 study published in *Food Microbiology*, researchers found that when homemade vegetable juices were fermented, their iron content was 16 percent more soluble than in raw juice.

Fermentation

- preserves and enhances B and C vitamins
- makes nutrients more readily available
- aids in digestion
- doesn't call for chemical preservatives
- is easy to do


Left: Sauerkraut is one of the many variations one can do when fermenting homegrown produce. Photo courtesy of Google Images. **Right:** Napa cabbage kimchi is a classic example of a fermented vegetable. Photo courtesy of Chowhound.com.

However, there is more to fermented vegetables than preventing spoilage, nutrient density, and probiotics for a healthy gut. To quote Christopher Shockey "By fermenting, you'll unlock new, unimagined, complex, deep flavors. You'll experience the unique flavor that comes from time and place with each delicious batch."

Easily made when you have a little time, fermented vegetables keep for months in a cool place, so you have instant side dishes. The ultimate convenience food!
Fermenting vegetables is a simple process that combines traditional methods and scientific knowledge to safely preserve food for flavor and nutrients. All you need is some fresh, organically grown, if possible, vegetables, a little salt and some glass jars or a crock. Tools include a sharp knife and a large bowl for mixing, and something to weigh down the vegetables in brine in the jar.

Salt. What kind to use and what does it do? Most fermentation experts recommend unrefined or partially refined sea salt. Most recommend against using iodized table salt that has other ingredients added. Likewise, if using kosher salt, read to find out if other ingredients have been added.

The proper amount of salt will inhibit the growth of bacteria that could cause putrefaction but will not harm the lactic acid bacteria (LAB). Too much salt will stop the fermenting process. Add a little at a time and let your taste buds be your guide. Moderation is the key. Remember it is the acidification by bacteria that preserves the vegetables, not the salt. Salt also enhances the texture of your vegetables because it hardens the pectin in the cells of the vegetables so they retain their crispness. A good ratio of salt to vegetables is about 1.5 percent by weight.

Recipes for making a ferment are readily found on the Internet, but the steps are basic. Finely cut or shred your washed vegetables. This breaks down the cell structure that helps the salt work more efficiently. It also frees up the plants' sugars that the LAB feed on and turn into acid. LAB are the good guys.

Add a little salt and massage the salt into the vegetables until it draws out the juices, or the brine, your LAB need to live. Because they are anaerobic, they don't need oxygen.

Pathogens, however, need oxygen to survive, so by moving the whole operation underwater you eliminate the forces of decay. This proper saline environment (more salt is not better) encourages the *lactobacillus* to create enough lactic acid to preserve and enhance the vegetables.

The key to success when making and storing a ferment is "Keep it submerged in brine and all will be fine." In other words, don't let air get to it.

The next step is to pack the vegetables into the crock or glass jar, pressing down firmly so that the brine covers the vegetables. Leave room in the jar for the ferment to expand and release CO_2 bubbles. Cover completely with a primary follower like cabbage leaves, strips of zucchini or carrot, then a secondary follower like a plate that is weighted down to keep air out and the ferment submerged in brine. Set on the kitchen counter at room temperature where you can keep an eye on it for the next week or two. Taste it from time to time, and when fermented to your liking, store in dark, cool place such as your refrigerator. It's ready to eat and enjoy.

Check out Your local library or the Internet for more information about fermentation.

RESOURCES:

- Fermented Vegetables. Shockey, Cristopher & Shockey, Kristen. Storey Publishing. 2014.
- Preserving Everything. Meredith, Leda. The Countryman Press. 2014.
- Preserving the Japanese Way. Singleton Hachisu, Nancy. Andrews McMeel Publishing. 2015.
- Real Food Fermentation. Lewin, Alex. Quarry Books. 2012.