Fermenting Vegetables: Food Safety Counts!

What do sauerkraut, kimchee, cheese, yogurt, salami, bread, along with beer and wine have in common? Their natural tart flavor or “tang” is created by a fermentation process. Fermentation has become what USDA calls a “movement that's picking up speed”.

Sauerkraut and genuine (crock) dill pickles are familiar home preserved fermented vegetables. Lactic acid created during fermentation, with the addition of salt, imparts tartness to the food and inhibits bacteria. This differs from pickling, where vinegar is added to vegetables to create a safe preserved product.

When fermenting, begin with a research-based, tested recipe for safe, quality fermented vegetables. These recipes will address the key factors you can control—salt concentration, temperature, and lack of air.

Salt is an essential ingredient. Measure canning or pickling salt carefully as the proportion of salt to vegetables determines bacteria activity and helps keep vegetables from becoming soft.

Ferment at temperatures of 68-72°F, although 60-78°F may work. If the temperature is too high, spoilage bacteria will ruin the fermentation. At lower temperatures, the process may not start.

The good bacteria which ferment cabbage, for example, grow best in a low-oxygen environment. Seal the crock, glass jar, or food-grade bucket following the recipe options.

Food safety counts throughout the fermentation process. Start the process with fresh, good quality clean vegetables. Always follow good food safety practices; wash produce, wash your hands, wash utensils and surfaces to insure a safe product.

Natural fermentation is one of the oldest methods of food preservation. When done properly, it reduces the risk of foodborne illness and food spoilage.

Making sauerkraut is a good way to get started on the road to fermentation. Learn how on page 2.
Make your own sauerkraut

Sauerkraut means “sour cabbage” in German—it’s naturally fermented cabbage. Sauerkraut has only 42 calories per cup and is a good source of vitamin C. It is high in sodium due to the salt used in fermentation. You can reduce the sodium, as well as the tartness, by rinsing sauerkraut in cold water before using.

Sauerkraut can easily be made and preserved at home with its basic ingredients of cabbage and salt. Use a researched tested recipe, as the proportion of salt to cabbage is critical to the quality and safety of sauerkraut.

To make good sauerkraut, begin by selecting disease-free, firm, sweet, mature heads of cabbage from mid-and late-season crops. Clean and shred the cabbage within 24 to 48 hours of harvest. A kraut cutter is the traditional way to shred the cabbage, but a modern-day food processor moves the process along and saves on the fingers.

Canning or pickling salt draws out the cabbage juice so it can be fermented. Using too little salt not only softens the cabbage, but also yields a product lacking in flavor. Too much salt delays the natural fermentation process. For every 5 pounds of shredded cabbage, mix in 3 tablespoons of canning salt.

The choice of container to pack the cabbage in is important. Old-fashioned earthenware crocks are traditional, and are still a good choice as long as they are not cracked or chipped. Food-grade plastic pails that are sturdy and rigid make excellent containers. You do not want to make sauerkraut in metal containers of any type, or in plastic containers that were never intended for food use.

Once the cabbage and salt mixture is packed tightly into a suitable container, it’s essential that you cover the cabbage and liquid to exclude air, since the fermentation process requires an anaerobic (air-tight) condition. A salt-water (brine-filled), food-grade plastic bag is one of the easiest and best ways to both cover and weigh down the cabbage.

Store the container at 68-74°F while fermenting. At these temperatures, the sauerkraut should be ready in three to four weeks.

Fully fermented sauerkraut may be canned or frozen. To can sauerkraut, fill jars with kraut and cover with juices, leaving ½ inch headspace; wipe jar rims; adjust lids and process in a boiling water bath; process pints for 20 minutes and quarts for 25 minutes. To freeze sauerkraut, fill freezer bags or plastic freezer containers to 1-2 inches from their tops, squeeze out air, seal, and label. Freeze for 8-12 months.

Corn Relish

For Minnesotans, sweet corn is best eaten on the cob! Cutting it off the cob and freezing it is a close second. This might be the year to try something new—Pickled Corn Relish http://bit.ly/1w50WWn.

For a variation, grill the corn to a brown color to give your relish a toasty flavor. Be careful not to burn the corn because a burnt flavor will ruin your relish!

It’s important to maintain the vegetable proportions to ensure the recipe is safe for home-canning, but you can change spices to make a Tex-Mex version:

- Substitute some jalapeno pepper for some sweet pepper. *Be sure the total amount of fresh pepper remains 5 cups.*
- ½ cup chopped fresh cilantro and 2 cups diced celery instead of 2½ cups diced celery
- 1 tsp minced garlic
- 1 Tbsp cumin seed instead of celery seed
- 1 Tbsp ground coriander instead of turmeric
- 1½ tsp ground cayenne pepper
Mushroom Tea or Kombucha

Kombucha is a fermented tea and has been around for centuries. Today, it is a hot item because some people believe it has health benefits. Regular drinkers of this tea claim it aids digestion and sleep, prevents cancer, stops hair loss, and improves liver function. Right now, none of these health claims have been confirmed.

Barb Ingham, University of Wisconsin Food Safety Specialist recently shared the following information and food safety considerations if you make kombucha at home:

“Often referred to as ‘mushroom tea’, kombucha is not made from mushrooms, but the bacteria and yeast that grow on top of the beverage result in a blob that resembles a mushroom. It is made by adding bacteria and yeast to sugar and black or green tea and allowing the brew to ferment.

According to WebMD, at first taste, kombucha tea tastes somewhat earthy, tart, with a little effervescence and a vinegar-like smell—not so pleasing to the taste buds. To make the tea more palatable, juice is added to the base brew. But if you look a little closer, you notice little floating bits of bacteria in the unpasteurized beverage. The fermented beverage is high in acid and contains sugar, B vitamins, antioxidants (from the tea), trace amounts of alcohol (a natural consequence of fermentation), and other chemical compounds.

Homemade kombucha ferments from a starter in 7-14 days. Some brands are pasteurized to kill potential pathogens; other brands and most home brews are drunk raw or unpasteurized. Some experts warn about the dangers of home-brewed and unpasteurized kombucha prepared in nonsterile conditions and the risk for unhealthy bacteria getting into the tea. The U.S. Food and Drug Administration cautions that home-brewed kombucha is at a high risk of contamination.

Food safety tips: There are no approved/tested recipes for the safe manufacture of kombucha. If you make this product at home, there are a few things to keep in mind:

- Sanitation is critically important. Use sterile containers and utensils during kombucha preparation.
- Sugar must be added and sucrose (table sugar) is preferred. Bacteria and yeast feed on sweetened, brewed tea to produce the final beverage. The tea must be sweetened for the microorganisms to grow and fermentation to progress.
- Tea, black or green, should be the beverage base. Do not use herbal teas.
- Heat the tea base to boiling, cool rapidly, and add the starter. Ferment at 68-72°F for 7-10 days; cooler temperatures (62-78°F) will also work. Do not ferment in the sun or outside where the temperature can rise too high.”


Pickled Eggs

Red Beet Eggs, Dark & Spicy Eggs, Dilled Egg, Cidered Eggs, Pineapple Pickled Eggs—WHAT? Yes, this is today’s arena of the home pickled hard cooked egg!

Know that there are no home canning directions for pickled eggs. All pickled egg recipes require storage in the refrigerator. Pickled eggs should never be at room temperature except for serving time, when they should be limited to no more than 2 hours in the temperature danger zone of 40 to 140 degrees F.

Surprise family and friends, serve your unique, tasty (easy to make!) pickled eggs. Here’s how: http://bit.ly/1sS5Nb.
Pickled Vegetables

Crispness is a characteristic of a good pickled vegetable. Crispness comes from the vegetable’s natural pectin which is the same ingredient we use in jams and jellies.

Use only fresh-picked vegetables for pickling. Vegetables become soft as the pectin structure changes due to high heat, improper handling or microbial activity. As each day passes after the vegetable has been picked, it loses its crispness.

Use only safe, research-based recipes for pickling. The proper acidity level creates a safe pickle but also helps keep the crispness.

Use low-temperature pasteurization or a boiling water bath when processing jars of pickles. Use a thermometer to be certain the water temperature in your canner remains above 180°F during the entire processing time. But, keep the temperature below 185°F to avoid breaking down the pectin which causes the pickle to soften.


Cleaning vs. Pickling Vinegar

Vinegar is a key ingredient to successful pickling. It’s important to look at the label and make sure the vinegar is food grade and has 5 percent acidity. Canning vinegars are made from grains and diluted with water to create a uniform pickling and table strength of 5 percent acidity such as distilled white vinegar and apple cider vinegar.

Because vinegar is used for cleaning items around the house, there are commercial “cleaning vinegars”. Many of these vinegars indicate on their label they are not food grade. They are typically a white distilled vinegar with 6 percent acidity.

If you use cleaning vinegar for a pickled product, you may be disappointed with the flavor and quality. Read the labels and make sure to select vinegar that is 5 percent acidity – no more, no less!

Frequently Asked Questions

What can I do with leftover pickling brine?

If the brine is fresh and has not been used to make pickles, cover it and store it in the refrigerator for another pickle batch or use in another way.

If the pickling brine has been in contact with vegetables or fruit being pickled, don’t use it for canning pickles. The reason is the liquid from the food will dilute the concentration of the vinegar. As a result, it may not be adequate to control spoilage organisms. It can be stored in the refrigerator and re-used in 1-2 days for barbecue sauce, coleslaw dressing or a marinade. If there is mold growth, throw it out!

Why do pickle recipes say to cut off the blossom end of the cucumber?

The blossom end contains enzymes that can cause softening. Remove at least 1/16th inch from the blossom end.

I saw an ad for a silicone canning jar lid? Looked like rubber. Is it really a canning lid?

The Canning Jar Lid ad was brought to our attention too. Our curiosity led us to discover the correct name: Silicone Canning Jar Topper (in red or green). The purpose is to provide an air-tight seal for storing unused portions after the metal lid is removed from a canning jar. It is not a canning lid.

Photos: Cabbage photos page 1 and 2; pickled eggs page 3 and pickled vegetables page 4 from thinkstock.com; Jars on page 2 National Food Preservation Center

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