



Oregon State University Extension Service

Preserving Foods

Kimchi Basics

What is kimchi?

Kimchi is a flavorful, sour, salty mix of fermented vegetables and seasonings that plays an important role in Korean culture. The history of kimchi dates back thousands of years and the original name, chimchae, translates to 'salted vegetables.'

There are more than 200 variations of kimchi; the types of ingredients and the preparation method have a profound impact on the taste. Napa cabbage, radishes, green onions, garlic, and ginger, along with a specific red pepper, are used in classical baechustyle, but region, seasonality, and cultural traditions influence the unique types of kimchi.

The nutritional value of kimchi varies with ingredients but it is generally low in calories and contains vitamins A, C, and B complex, as well as various phytochemicals and live cultures of microorganisms which confer a health benefit to the host. Eating kimchi can be a healthful way to include more vegetables and probiotic microorganisms in the diet.

How is kimchi made?

Making kimchi requires maintaining a clean environment and good hygiene practices, carefully following all steps, and monitoring temperatures to foster the growth of *Weissella* species, *Lactobacillus* species, and other bacteria contributing to the fermentation process. The bacterial cultures needed for fermentation are present on the raw ingredients, so a 'starter' culture is unnecessary.

- The process of making kimchi involves brining (salting) the vegetables to draw out the water, which helps in preservation and allows the seasonings to penetrate the food over time; the final salt concentration ranges from 2-5%.
- Kimchi is typically fermented by 'wild cultures' naturally present on the vegetables. The formation of organic acids (primarily lactic and acetic acid) results in an **optimum kimchi pH of 4.2**.
- The kimchi fermentation process is very short in comparison to making sauerkraut. Kimchi ferments at room temperature in only 1-2 days or more slowly in the refrigerator. **For safety, kimchi should be stored refrigerated and is best eaten within 1 week**, as the quality of kimchi deteriorates with longer fermentation.

Source: Colorado State University Extension Service

Recipes



Fermented Kimchi

Yield: 3 Cups

Ingredients

2 lb Napa cabbage	2 ½ TB salt
¼ lb daikon radish	2 green onions
3 cloves of garlic	2 tsp. finely chopped red pepper
2 tsp. sugar	

**Optional: Add 1 tsp finely grated ginger*

**Optional: substitute hot pepper for red pepper*

**Optional: 1 tsp. red pepper flakes*

Directions

1. Rinse and cut cabbage into 1-inch pieces. Toss cabbage in bowl with 2 TB's of salt and let sit for several hours until reduced to half its volume. Put cabbage into a colander and rinse thoroughly, drain without pressing.
2. Cut and peel daikon into matchstick pieces (for authenticity) or shred coarsely in a food processor. Cut off green and white portions of onions into thin slivers. Mince the garlic and red pepper. Mix all the vegetables in with cabbage add remaining salt (½ TB) and 2 tsp of sugar- toss well.
3. Pack loosely into a 1-quart jar and cover. Let stand at room temperature for 1-4 days, then store in the refrigerator.

Fermentation proceeds more rapidly during warm weather and the flavor varies considerably with the length of fermentation.

Based on recipe from "Food Preservation and Safety, Principles and Practice" by Shirley J. VanGarde and Margy Woodburn.

Newell Kimchi

Makes About: 1 Quart Jar (32 oz | 946 ml)

- 1 cup (240 mL) non-chlorinated water, such as spring or filtered
- 1 Tbsp (15 mL) plus 1 tsp Ball® Salt for Pickling and Preserving
- 1-2 medium Napa cabbage (about 2 lbs/1 kg), rinsed
- 3 garlic cloves
- ½ cup (120 mL) dried Korean chili flakes
- 3 Tbsp (45 mL) grated ginger
- 1 Tbsp (15 mL) fish sauce
- 1 Tbsp (15 mL) lite soy sauce
- 1 bunch green onions (scallions), green and white parts thinly sliced
- 1 unpeeled carrot, scrubbed and grated
- To make additional brine: dissolve ½ tsp (2.5 mL) Ball® Salt for Pickling and Preserving in ½ cup (120 mL) non-chlorinated water

Directions

1. Dissolve 1 tsp (5 mL) salt in 1 cup (240 mL) water and set aside.
2. Remove any bruised outer leaves of cabbage. Cut cabbage into quarters then remove and discard the core sections. Slice quarters into 2 ½ in. (6 cm) -wide ribbons and place in a large bowl, then sprinkle with 1 Tbsp (15 mL) salt. Massage salt into cabbage, squeezing to release liquid. Cover bowl and let stand 1-2 hr.
3. Process garlic, chili flakes, ginger, fish sauce, and soy sauce in a food processor until a paste forms. Add carrots and green onions to cabbage. Add chili paste mixture and massage to combine.
4. Pack kimchi into the jar, tamping down firmly with a spoon. Leave at least 2 in. (5 cm) of headspace. Pour any liquid collected in the bowl over the kimchi, pressing down firmly to help liquid cover the cabbage. There may not be a lot of natural brine at this time, but the cabbage will continue to release it slowly.
5. Place spring on top of cabbage, then twist lid on.
6. Wipe jar down and cover with a cloth. Store in a cool (68°F-72°F or 20°C-22°C) place for 24-36 hours. If after this time the brine does not cover the cabbage by 1 in. (2.5 cm), remove lid and spring, add some additional brine to cover. Wipe jar rim before replacing spring and lid. Discard remaining reserved brine.
7. Check daily to make sure vegetables remain submerged in brine.
8. Let kimchi ferment for 1 week, then taste for the mild tangy flavor. If flavor is to your liking, proceed to step 9. If you prefer a stronger flavor ferment up to 1 additional week, tasting every 3 days, until flavor develops.
9. Once desired flavor is reached remove spring and add fresh brine as necessary to cover. Wipe jar rim before replacing lid or use a Ball® canning lid. Store in refrigerator up to 6 months.

Source: *freshpreserving.com* Newell Brands, Inc. Used with permission.



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