Understanding and Making Kimchi

What is kimchi?
Kimchi is a flavorful, sour, salty mix of fermented vegetables and seasonings that plays an important role in Korean culture. 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 baechu style, 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 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.

Kimchi Resource

Acknowledgments

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Kimchi is a fermented vegetable condiment, traditional to Korean cuisine. Season will impact vegetable size and quality, as well as time needed for fermentation. Look for light-green Napa cabbage with compact, elongated heads that feel heavy for size. In summer, Napa cabbage may be softer and ferment faster; while in winter, Napa cabbage may be firmer and need more time to ferment. Some ingredients, such as Korean red pepper powder and Korean radish, may need to be purchased through specialty Asian stores or ordered online.

During preparation, proper sanitation practices must be followed to prevent contamination by spoilage or harmful microorganisms. This includes proper hand washing as well as using clean equipment, utensils, and surfaces throughout all preparation steps.

Equipment:
- Large sharp knife and cutting board
- Blender or food processor (optional for blending ginger and garlic)
- Measuring cup, measuring spoons, and mixing utensils
- 1-quart saucepan for making sweet rice paste
- Food-safe, glass or plastic storage container with tight fitting lid. For example: plastic rectangle kimchi container, glass mason jars with bands and lids, or gallon-size re-sealable zipper plastic bags. Do not use metal containers nor earthenware with cracks or chips. Container(s) must fit in your refrigerator, but big enough to hold 2 cabbages.
- Large glass, plastic, or stainless steel mixing bowl
- Disposable food handler gloves (highly recommended) for protection from red pepper powder while handling kimchi

Ingredients:
- 2 medium heads Napa cabbage (about 6-8 pounds total)
- 1 ½ cups coarse salt, non-iodized, divided (baked or sea salt recommended)
- 1 gallon + ½ cup cold water, divided
- 2 Tbsp. sweet rice flour
- 1-10 cloves garlic, depending on taste preference
- About 3 slices fresh ginger root (about 0.2-0.4 oz.)
- 1 cup Korean red pepper powder – specific “for kimchi”
- ½ Korean radish (about 1-1.5 pounds), or daikon radish
- 1 Asian pear (optional)
- 10 green onions
- 1 tsp. fish sauce (optional)
- 2 tsp. finely ground salt (optional, as needed)
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