

Exploring the World of Fermented Foods with Kimchi and Tempeh



The earliest evidence of fermentation dates back to 6000 B.C. discovered in the Fertile Crescent, also known as the “cradle of civilization.” Since then, practically every civilization after has at least one fermented food in its culinary legacy¹⁵. Many nations have developed distinctive tastes and customs surrounding fermentation, from Korean kimchi and Indian chutney to the sauerkraut, yoghurt, and cheese¹⁵.

Fermented foods referred to foods or beverages that have undergone controlled microbial growth as well as enzymatic conversion of food components¹. Demand for fermented food such as kimchi, sauerkraut, tempeh and others is encouraged by the rising trend of veganism and inclination of consumers towards plant-based diets. Furthermore, the market is expected to be driven in the upcoming years by consumer trends in health and wellness that are expanding rapidly, as well as rising awareness of the health benefits of fermented foods and beverages⁸.

What is Kimchi?

Kimchi is a traditional Korean cuisine that was introduced over 3,000 years ago. The tradition of making kimchi started with the fermenting and storing of vegetables during the cold wintertime when many Koreans died due to starvation¹⁶.

Kimchi is a vegetable-based food fermented by probiotic lactic-acid bacteria (LAB), and the most loved kimchi by Korean is baechu (cabbage) kimchi (>70%)². Because of its probiotics, physiologic nutrients and phytochemicals, kimchi is recognized as a healthy diet⁴. Moreover, kimchi has become a trend due to its versatility and contribution to a big and bold flavour in every meal¹⁴. Kimchi also has various types depending on the ingredients used and processing methods⁴.

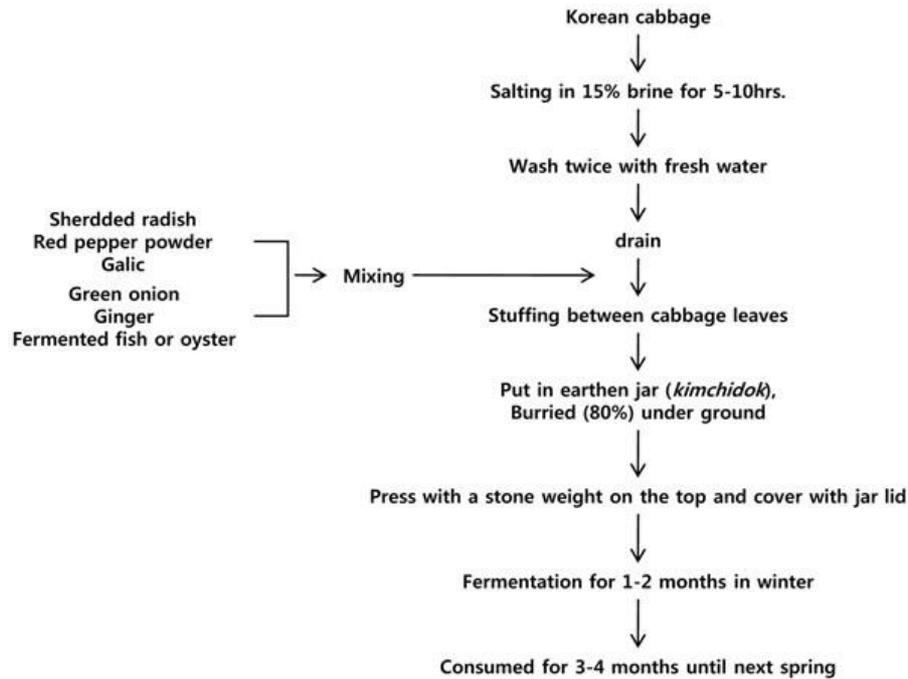


Fig. 1 Kimchi processing method¹²

What is Tempeh?

Tempeh is another type of fermented food produced by *Rhizopus* spp. fermentation of cooked soybeans⁶. It originated in Indonesia, where it is still the most widely consumed soy product. Tempeh's chewy texture and unique flavour makes it an ideal meat substitute, despite the fact that it is not as well-known as tofu in the United States.

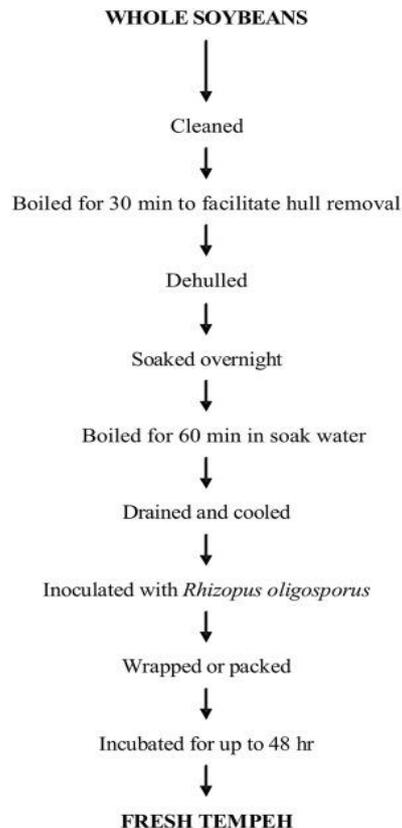


Fig.2 Preparation of tempeh⁶

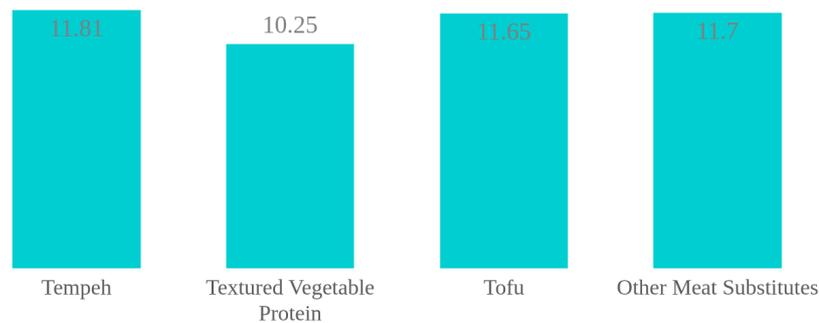
Tempeh as a Meat Replacement

Tempeh, which is rich in protein has long been viewed as a meat substitute for underprivileged communities due to the inexpensive method required for processing this food, presenting a low price with high nutritional content¹³. Moreover, they have become a popular meat alternative among vegetarians and vegan consumers for their health benefits, such as isoflavones and saponins⁷. As a meat substitute, the advantages of tempeh are as below⁷.

- High protein content
- Rich in vitamin B, iron, minerals, and fibres.
- Cholesterol-free
- Gluten-free
- Vegan
- Easily digested.

With a predicted CAGR of 11.81% throughout the forecasted period, tempeh is going to be the fastest-growing meat substitute consumed globally (2022-2028)⁸.

Global Meat Substitutes Market, CAGR %, By Type, 2022 - 2028



Source: Mordor Intelligence

Rich In Probiotics

As a fermented food, kimchi and tempeh are powerful probiotics, whereby both also contain *Lactobacillus plantarum* which can boost the immune system and promotes healthy gut flora. Eating fermented foods can help minimize the unpleasant symptoms of a variety of gastrointestinal illnesses, including irritable bowel syndrome and colon inflammation. Therefore, keeping a balanced gut flora is crucial for your overall health³.

Source of Protective Antioxidants

Kimchi is a rich source of antioxidants such as vitamins, carotenoids, flavonoids, and phenolic compounds while tempeh is rich in isoflavones. Accumulation of dangerous free radicals may contribute to several illnesses, such as diabetes, heart disease, and cancer. Therefore, these antioxidants work by neutralizing free radicals²¹. Various studies have demonstrated that isoflavones in tempeh could lower oxidative stress indicators by boosting antioxidant activity in the body. Kimchi is also a great source of antioxidants that helps in preventing oxidative stress from harming our cells. Thus, it could help to prevent or lower the risk of certain diseases. Furthermore, kimchi may help protect against cellular aging caused by oxidative stress²².

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