

## Pickles, *Tsukemono*

Pickles are a source of enzymes and probiotic microorganisms, because of the fermentation process. In Japan pickles are known as *tsukemono*.

### Diet, fermented foods, gut microbiome, and health

The gut microbiome has trillions of micro-organisms including bacteria, viruses, protozoa, and fungi. Bacteria and other microbes enable the body to digest food. Food is the key as it impacts the health and diversity of microbes. The body is better prepared to eat fresh whole foods, rather than high-fat, high-sugar processed foods. It is increasingly understood that the diversity of the gut microbiome is critical for the body's efficient processing of food. A damaged gut microbiome is associated with weight gain and other problems. A fermented food-rich diet has been found to increase microbe diversity.

There is a variety of *tsukemono* reflecting a diversity of ingredients and different fermenting methods, Fig.1. Fermenting methods include the use of miso, soy sauce, vinegar, or salt. For example, *gari*, the ginger pickle found in sushi restaurants is ginger pickled in vinegar and sugar.

Fig.1 Japanese Pickles: <i>Tsukemono</i>			
	Japanese name	Description	Comments
1.	Asazuke	Lightly pickled vegetables	Mild flavour, crunchy
2.	Takuan	Pickled daikon	Extended process, mellow pungency
3.	Kimchi	Salted and fermented cabbage and radish	
4.	Nukazuke	Rice-bran fermented vegetables	
5.	Hakusaizuke	Pickled Chinese cabbage	
6.	Shiozuke	Salt-pickled vegetables	The most basic form
7.	Umeboshi	Salt-pickled plums	Red shiso leaves turn the plums purple
8.	Nozawanazuke	Pickled turnip leaves	
9.	Shibazuke	Pickled eggplant and cucumber	Salt, red shiso leaves. Purple colour
10.	Fukujinzuke	Soy-sauce-pickled vegetables	
11.	Rakkyo	Sweet pickled Chinese onions	Brined in vinegar and sugar
12.	Takanazuke	Pickled mustard leaf	
13.	Senmaizuke	Pickled bulbous Kyoto turnip	Salt and konbu to add extra umami
14.	Amazuzuke	Sweet-vinegar-pickled vegetables	
Note: Japanese pickles ranked by popularity. Please see the article: "Asazuke" Tops Ranking of Japan's Favorite Pickles, Nippon.com, 9 March 2023			
Source: Nippon.com (note above), Conceptasia, March 2023			

### Additional benefits of Pickles, *Tsukemono*

In addition to *tsukemono* being a source of enzymes and probiotic microorganisms, a second benefit comes from the essential vitamins, minerals, e.g., potassium, polyphenols and dietary fiber found in vegetables. Polyphenols have antibacterial and antioxidative effects.