

How To Preserve Veggies By Blanching?



Blanching is a thermal treatment which is usually performed prior to other food processes such as drying, canning, freezing and etc (Xiao et al., 2017). Vegetables are typically immersed in water or steamed at around 85°C-100°C for 1 to less than 10 minutes, depending on the type and thickness of the vegetables (Hui et al., 2015; Xiao et al., 2017). Blanching duration is crucial and must be appropriately adjusted according to the size and type of foods based on the varying susceptibility to degradation with thermal processing (Huang et al., 2016).

The several blanching methods include using hot water (the most conventional way), steaming, via a microwave, ohmic, and infrared (Xiao et al., 2017).

The purposes of blanching are:-

- **Inactivation of quality-deterioration enzymes**
 - Blanching can inactivate enzymes responsible for deterioration reactions that can induce off-flavours, odours, undesirable colour and texture, and breakdown of nutrients (Xiao et al., 2017).
- **Removing pesticide residues and toxic constituents**
 - According to Bonnechère et al. (2012), hot water blanching is the most effective way to remove pesticide residues by 10–70%, while blanching in microwave without water reduced pesticide residues by 39%, and washing with tap water reduced residues by 10–50%.
 - Removing pesticide residues from fruits and vegetables is vital for human health as the toxic components of pesticides might lead to ill symptoms such as headaches, nausea and serious diseases like cancer (Xiao et al., 2017).
 - Blanching can also clean plant’s surfaces and remove foreign material including dusts off fruits and vegetables (Xiao et al., 2017).
- **Minimizing non-enzymatic browning reactions**
 - Blanching could minimise maillard reaction or caramelization that occurs in food during frying, cooking, drying, and storage. Hence, product colour can be preserved (Xiao et al., 2017).
- **Decreasing microbial load**
 - Inactivation or inhibition of microbial growth is essential to assure safe and disease free foods (Xiao et al., 2017).
 - Parasites and its eggs can be eliminated through this process (Xiao et al., 2017).

Table 1. Preparing Vegetables for Freezing

Vegetables	Preparation and Blanching in Boiling Water
Asparagus	Small stalks 2 minutes; medium stalks 3 minutes, large stalks (½- to ¾-inch diameter) 4 minutes.
Beans, green and yellow podded	Blanch 3 minutes.
Beans, lima	Blanch small beans 2 minutes; medium beans, 3 minutes; large beans 4 minutes. If desired, blanch in the pod and shell after cooling.

Beets	Cook and removed skin, blanching is unnecessary.
Broccoli	Blanch 3 minutes in water or steam-blanch 5 minutes.
Brussel sprouts	Blanch small heads 2 minutes; medium heads 4 minutes; large heads 5 minutes.
Cabbage	Blanch wedges 3 minutes and shredded cabbage 1½ minutes.
Carrots	Dice or slice ¼-inch thick. Blanch 2 minutes.
Cauliflower	Blanch 3 minutes.
Corn, sweet, cut whole kernel	Blanch corn kernel for 4½ minutes.
Corn, sweet on-the-cob	Blanch small ears (1¼-inch diameter) 7 minutes; medium ears (1¼-1½-inch diameter) 9 minutes; large ears (over 1½-inch diameter) 11 minutes.
Herbs	Wash and drain, but do not blanch leaves.
Kohlrabi	Blanch 1 minute.
Okra	Blanch small pods 3 minutes; large pods 4 minutes.
Peas (green, english, blackeyed)	Blanch green and English for 1½ minutes. Blanch blackeyed peas 2 minutes.
Peas (edible, podded, sugar, Chinese)	Blanch 1½ to 3 minutes.
Peppers (sweet, green, red)	Blanch halved peppers 3 minutes. Chopped peppers can be frozen without blanching.
Potatoes	For ¾-inch diameter, blanch 4 minutes; 1-inch diameter, blanch 6 minutes; 1½-inch diameter, blanch 7 minutes. For those larger than 1½-inch diameter, blanch 8 to 10 minutes.
Pumpkin (Squash, winter)	Bake or steam until tender. Spoon into moisture-proof containers.
Leafy Greens	Blanch most leafy greens 2 minutes.
Zucchini (Squash, summer)	Cut in ½-inch slices. Blanch 3 minutes.

(Adopted from Francis & Heel, 2015).

With respect to the retention of sensory attributes and nutritive properties, freezing fruits and vegetables is regarded as one of the exceptional food preservation techniques other than canning and dehydration. Besides that, freezing is often used as a process to maintain fresh-like characteristics with minimal loss of valuable nutrients such as vitamins, and antioxidant content over long periods (Patras et al., 2011).

Although freezing helps to preserve food by retarding the enzymatic reactions, senescence and microbial growth, it does not fully stop these reactions. The frozen vegetables may still develop undesired odours, colours, flavours as well as changes in texture and loss in nutrient (Patras et al., 2011). Vegetables that are blanched and then frozen turn out to be in better condition than those that are frozen raw. Not only do blanched vegetables win on taste, colour and texture, but blanching also helps them retain nutrients (Storey & Storey, 2010). In short, blanching pre-treatment is necessary to make freezing a more viable way of long term storage of vegetables (Hui et al., 2015).

References

- Bonnechère, A., Hanot, V., Jolie, R., Hendrickx, M., Bragard, C., Bedoret, T., & Van Loco, J. (2012). Effect of household and industrial processing on levels of five pesticide residues and two degradation products in spinach. *Food Control*, 25(1), 397-406. <https://doi.org/10.1016/j.foodcont.2011.11.010>
- Francis, S. L., & Heel, H. V. (2015). *Freezing: Fruits and Vegetables*. Ames: Iowa State University Extension and Outreach.
- Huang, Y., Xiao, D., Burton-Freeman, B., & Edirisinghe, I. (2016). Chemical Changes of Bioactive Phytochemicals during Thermal Processing. Reference Module In Food Science. <https://doi.org/10.1016/b978-0-08-100596-5.03055-9>
- Hui, Y., Evranuz, E., Bingöl, G., Erten, H., & Jaramillo-Flores, M. (2015). *Handbook of Vegetable Preservation and Processing* (2nd ed., p. 206). Boca Raton: CRC Press.

Patras, A., Tiwari, B., & Brunton, N. (2011). Influence of blanching and low temperature preservation strategies on antioxidant activity and phytochemical content of carrots, green beans and broccoli. *LWT - Food Science And Technology*, 44(1), 299-306. <https://doi.org/10.1016/j.lwt.2010.06.019>

Storey, J., & Storey, M. (2010). *Storey's Basic Country Skills: A Practical Guide to Self-Reliance* (p. 430). North Adams, MA: Storey Publishing.

Xiao, H., Pan, Z., Deng, L., El-Mashad, H., Yang, X., & Mujumdar, A. et al. (2017). Recent developments and trends in thermal blanching – A comprehensive review. *Information Processing In Agriculture*, 4(2), 101-127. <https://doi.org/10.1016/j.inpa.2017.02.001>