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# Cooking to Preserve Nutrients

*Cooking food offers multiple benefits. It improves food safety, eases digestion, and boosts flavor.<sup>1</sup> However, cooking also affects nutrients in food. Changes to the nutrients in foods are complex and depend on the cooking method and the nutrient type. No cooking method keeps all nutrients perfectly. Still, you can follow some best practices to keep as many nutrients as possible in your food.*

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## QUICK LIST OF COOKING BEST PRACTICES:

- Choose steaming, baking, sous vide, sautéing, and microwaving to preserve nutrients in food.
- Limit grilling, smoking, and frying.
- Bake or steam seafood.
- Steam or microwave cruciferous vegetables.
- Choose fresh fruit when it is in season and as your budget allows.
- Use fats or oils with the right smoke point for your cooking method. See IFM's [A Guide to Cooking with Fats and Oils](#) for details.
- Pair vegetables with healthy fats.

Humans have been cooking their food for a long time—approximately 780,000 years<sup>2</sup>. We cook food to:

- Destroy bacteria, viruses, and parasites that could make us sick<sup>3</sup>
- Break down high-fiber foods, which may improve our ability to digest nutrients from them<sup>4,5</sup>
- Make animal proteins easier to digest<sup>6,7</sup>
- Improve the flavor and texture of food

## General Guidelines for Preserving Nutrients

Several factors impact how well foods retain nutrients during cooking. Shorter cooking times, lower cooking temperatures, and using less cooking water (or consuming it, such as in soup or stew) can help you get more nutrients from food. In addition, using healthy cooking oils supports absorption of fat-soluble nutrients like vitamins A and E and carotenoids.<sup>8,9</sup> For cooking methods that do not use a cooking fat, such as steaming, serve or finish the food with a fat or oil (e.g., avocado, olive oil, nuts, etc.) to help your body absorb fat-soluble vitamins.



## Cooking Methods

We use many cooking methods in our daily lives. Each cooking method has different effects on the nutrient content of our food.

Cooking Method	Description of Cooking Method	Nutrients Increased	Nutrients Decreased	Nutrients Preserved	Key Takeaways
<b>Air Frying</b>	Circulates hot air around food inside a countertop oven. Uses little to no oil but creates a crispy texture.	Increases antioxidants in cruciferous vegetables. <sup>10</sup> Increases carotenoids in carrots. Carotenoids are yellow, orange, and red pigments and function as antioxidants. <sup>11</sup>	Decreases antioxidants in bell peppers. <sup>12</sup>	Not enough research to determine if nutrients are preserved.	Impact on nutrients depends on the type of food, cooking temperature, and cooking time. A short cooking time may better preserve nutrients. <sup>10</sup>
<b>Baking</b>	Cooks using hot, dry air, usually in an oven. Can change liquids to solids, such as cookie batter to cookies.	Increases carotenoids and omega-3 fats. <sup>13,14</sup>	Decreases folate in grains and potatoes. <sup>15,16</sup> Some microbes involved in fermentation produce folate. As a result, baked sourdough bread may retain slightly more folate than regular bread. <sup>15</sup>	Not enough research to determine if nutrients are preserved.	Has mixed effects on nutrients in food but overall, it is a good method.
<b>Roasting</b>	Cooks using hot, dry air, usually in an oven. Cooks foods that have a solid structure before cooking begins (e.g., meat and vegetables).	Not enough research to determine if nutrients increase.	Decreases some phytonutrients in plant foods. Phytonutrients are natural compounds found in plants that protect them from harm and may offer us health benefits. <sup>1</sup> Decreases some minerals when food is browned. <sup>1</sup>	May preserve vitamin C. <sup>17</sup>	Has mixed effects on nutrients in food. Steaming and microwaving may be better than roasting for preserving nutrients in vegetables.
<b>Boiling</b>	Uses hot water (212°F, or 100°C) to cook food.	Not known to increase nutrients.	Decreases folate, vitamin C, carotenoids, and glucosinolates, phytonutrients in cruciferous vegetables. <sup>1,18,19</sup> Water-soluble nutrients leach into the boiling water and are lost if the water is discarded.	Not enough research to determine if nutrients are preserved.	Decreases many water-soluble nutrients. The larger the volume of water, the higher the water temperature, and the longer the cooking time, the more boiling decreases nutrients.

The increased, decreased, and preserved nutrients presented in the table are based on individual studies of specific foods prepared with specific cooking methods, with variations in cooking temperature and time. For some nutrients, conflicting information exists regarding the impact of a particular cooking method on the nutrient. Where information is conflicting, we have stated this and provided references.

Cooking Method	Description of Cooking Method	Nutrients Increased	Nutrients Decreased	Nutrients Preserved	Key Takeaways
<b>Blanching</b>	<p>Uses hot water (212°F, or 100°C) to cook food, followed by immediate cooling in ice water to stop cooking.</p> <p>Is a quick cooking method (e.g., 1-15 minutes).</p> <p>Vegetables are often blanched before freezing.</p>	Not known to increase nutrients.	Decreases potassium and vitamin C in kale and spinach. <sup>20</sup>	Preserves glucosinolates when the water temperature is lowered to 122-140° F (50-60° C) <sup>21</sup>	<p>Decreases some water-soluble nutrients.</p> <p>The larger the volume of water, the higher the water temperature, and the longer the cooking time, the more blanching decreases nutrients.</p>
<b>Braising</b>	Browns food with dry heat and then simmers it in a covered pot with a cooking liquid.	Not known to increase nutrients.	Decreases omega-3 fats. <sup>22</sup>	Not enough research to determine if nutrients are preserved.	<p>Since the cooking liquid is kept, water-soluble nutrients might stay in the food better than boiling.</p> <p>Choose methods besides braising, such as baking or steaming, to prepare omega-3 food sources like seafood.</p>
<b>Canning</b>	A method of food preservation in which food is processed and stored in an airtight container, extending the food's shelf life.	Increases vitamin C, beta-carotene, polyphenols, and flavonoids in mango and pineapple. <sup>23</sup>	Not enough research to determine if nutrients decrease.	Preserves nutrients in apricots. <sup>24</sup> When fruits and vegetables are exposed to oxygen, they degrade over time. Canning removes oxygen, so, it may preserve oxygen-sensitive nutrients, such as B vitamins. <sup>25</sup>	<p>Canning may decrease some nutrients and preserve others.</p> <p>Look for canned fruits and vegetables that say, "no added sugar," "packed in water," "low sodium," or "no salt added," ideally in BPA-free cans.</p>
<b>Fermentation</b>	<p>Uses microbes, including bacteria and yeasts, to process foods.</p> <p>Creates many tasty foods, including yogurt, cheese, sauerkraut, and kimchi.<sup>26</sup></p>	Increases folate and vitamin B12 in fermented soybeans. <sup>27</sup>	Decreases vitamin C and phytonutrients in fermented vegetables such as sauerkraut. <sup>28</sup>	Not enough research to determine if nutrients are preserved.	<p>Consider eating fermented soy instead of unfermented soy to get more nutrients.</p> <p>Eat fermented vegetables, but also include fresh vegetables in your diet.</p>

Cooking Method	Description of Cooking Method	Nutrients Increased	Nutrients Decreased	Nutrients Preserved	Key Takeaways
Frying	Cooks food quickly in a small amount of hot fat or oil.	Not known to increase nutrients.	Decreases omega-3 fats in seafood <sup>14</sup> and vitamins in vegetables. <sup>1</sup>	Not enough research to determine if nutrients are preserved.	Limit frying. <sup>29</sup> Use fat or oil with a high smoke point to minimize the formation of harmful trans fats and acrylamide, a probable human carcinogen. <sup>30,31</sup>
Sautéing	Quickly fries food in a small amount of hot fat.	Not enough research to determine if nutrients increase.	Decreases antioxidants in cruciferous vegetables like kale, Brussels sprouts, and cabbage. <sup>10</sup>	Not enough research to determine if nutrients are preserved.	Sautéing is preferred over frying.
Grilling	Cooks food directly over a dry heat source, such as charcoal or wood. Gives food a smoky and, sometimes, charred flavor.	Increases phytonutrients in red onions and vitamins E and K in spinach and chard. <sup>32,33</sup> May improve protein digestion from meat. <sup>7</sup>	Decreases antioxidants in red bell peppers and omega-3 fats in seafood. <sup>12,14</sup>	Not enough research to determine if nutrients are preserved.	Increases some nutrients and decreases others. By mixing up your cooking methods and eating a variety of foods, you can get the nutrients you need while enjoying grilled meals.
Microwaving	Uses electromagnetic waves to stimulate the molecules in food, making them vibrate and spin, and heating the food.	Increases vitamins C and E in spinach, chard, broccoli, and zucchini. <sup>34</sup> Microwaving cruciferous vegetables for under a minute can increase the phytonutrient sulforaphane. <sup>35</sup>	Decreases some beneficial phytonutrients in plant foods. <sup>18</sup>	Preserves vitamin C.	Cooks food quickly, which helps preserve some nutrients and makes it a healthy choice for cooking vegetables. Longer microwave cooking times are more likely to break down nutrients than short cooking times. Use glass and ceramic containers only. Do not microwave food in plastic containers, as these can leach harmful chemicals into your food. <sup>36</sup>
Pressure Cooking	Cooks with high-pressure steam or water inside a sealed container, helping food cook quickly.	Increases iron and zinc in black beans and iron in cowpeas. <sup>37,38</sup>	Not enough research to determine if nutrients are decreased.	Not enough research to determine if nutrients are preserved.	A good way to cook legumes because it can increase nutrients.

Cooking Method	Description of Cooking Method	Nutrients Increased	Nutrients Decreased	Nutrients Preserved	Key Takeaways
<b>Simmering</b>	Like boiling because it is a liquid-based cooking method. Only heats food to 185-200°F (85-93°C).	Because simmering uses a lower cooking temperature than boiling and boiling decreases nutrients, <sup>1,18,19</sup> it may preserve nutrients better than boiling.	Not enough research to determine if nutrients decrease.	May preserve water-soluble nutrients since it uses a lower water temperature than boiling. <sup>1,18,19</sup>	May help preserve nutrients because it is a gentle cooking method.
<b>Poaching</b>	Liquid-based cooking method that heats food to a maximum of 180°F (82°C). Used for delicate foods like eggs, poultry, fish, and fruit.	Poached eggs offer more digestible protein and vitamin D3 than eggs prepared as an omelet. <sup>39</sup>	Not enough research to determine if nutrients decrease.	Not enough research to determine if nutrients are preserved.	May help preserve nutrients because it is a gentle cooking method.  To get more nutrients from eggs, consider poaching rather than pan-frying.
<b>Slow Cooking</b>	Prepared gently, usually in a liquid, over low heat for an extended period. Soups, stews, and one-pot meals are examples of slow-cooked foods.	Not enough research to determine if nutrients increase.	While slow cooking can make tough cuts of meat more tender, it may reduce the digestibility of their proteins. <sup>7</sup>	During slow-cooking, water-soluble vitamins, minerals, and beneficial proteins <sup>40</sup> leach into the cooking liquid, so this method may preserve these nutrients.	May preserve water-soluble nutrients.
<b>Smoking</b>	Cooks or preserves food by exposing it to smoke from a burning fire or other smoldering material.	Not enough research to determine if nutrients increase.	Decreases omega-3 fats in seafood. <sup>14</sup>	Not enough research to determine if nutrients are preserved.	Enjoy smoked seafood on occasion. However, mix it up with seafood prepared through gentle methods such as baking and steaming.
<b>Sous vide</b>	Cooks food in a vacuum sealed bag submerged in water at a precisely controlled temperature. Cooks food evenly and keeps moisture. Produces tender and flavorful food.	Not enough research to determine if nutrients increase.	Decreases some antioxidants, carotenoids, and vitamin C in vegetables. <sup>41</sup>	Preserves B vitamins in meat and minerals in Brussels sprouts, broccoli, and beetroot. <sup>42,43,44</sup>	May preserve some nutrients in meat and vegetables.  Use food-grade bags that are BPA-free.

Cooking Method	Description of Cooking Method	Nutrients Increased	Nutrients Decreased	Nutrients Preserved	Key Takeaways
Steaming	Cooked gently above boiling water, not touching it. Steam from boiling water provides heat to cook the food quickly.	Increases sulforaphane in broccoli. <sup>19</sup>	Not known to significantly decrease nutrients.	Preserves omega-3 fats in seafood and most water-soluble nutrients because very little water is lost from food. <sup>14,1</sup>	An excellent cooking method for preserving nutrients.
Stir Frying	Cooks food rapidly over high heat in a lightly oiled pan while stirring the food.	Isn't known to increase nutrients.	Decreases phytonutrients in a variety of vegetables. <sup>45</sup>	Preserves phytonutrients in Chinese cabbage. <sup>46</sup>	The effects of stir-frying on nutrients is mixed, possibly because a variety of cooking times are used for stir-frying in studies. <sup>45</sup>  Stick to a short cooking time to better preserve nutrients.
Cooking in clay/earthen cookware	A traditional cooking method that uses slow, even heat to retain moisture and enhance flavors and tenderness, making it ideal for soups and stews.	Fermenting foods in earthen pots may increase some phytonutrients content due to their porous structure, which supports the growth of microbes that can break down the food and increase phytonutrients. <sup>47</sup>	Not enough research to determine if nutrients decrease.	May preserve calcium and lower oxalates better in rabadi (a traditional milk-based western Indian dish), compared to cooking in a steel pot. <sup>48</sup>	Can increase nutrients in fermented and cooked foods.  Choose clay and earthen pots that are unglazed to avoid lead contamination, as lead is often found in glazes.

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