**How Cooking Affects the Nutrient Content of Foods**

Eating nutritious foods can improve your health and energy levels.

Surprisingly, the *way* you cook your food has a major effect on the amount of nutrients it contains.

This article explores how various cooking methods affect the nutrient content of foods.

**Nutrient content is often altered during cooking**

Cooking food improves digestion and increases the absorption of many nutrients

For example, the protein in cooked [eggs](https://www.healthline.com/nutrition/10-proven-health-benefits-of-eggs) is 180% more digestible than that of raw eggs

However, some cooking methods reduce several key nutrients.

The following nutrients are often reduced during cooking:

* **water-soluble vitamins:** vitamin C and the B vitamins — thiamine (B1), riboflavin (B2), niacin (B3), pantothenic acid (B5), pyridoxine (B6), folic acid (B9), and cobalamin (B12)
* **fat-soluble vitamins:** vitamins A, D, E, and K
* **minerals:** primarily potassium, magnesium, sodium, and calcium

**Summary**

Although cooking improves digestion and the absorption of many nutrients, it may reduce levels of some vitamins and minerals.

**Boiling, simmering, and poaching**

Boiling, simmering, and poaching are similar methods of water-based cooking.

These techniques differ by water temperature:

* **poaching:** less than 180°F (82°C)
* **simmering:** 185–200°F (85–93°C)
* **boiling:** 212°F (100°C)

Vegetables are generally a great source of vitamin C, but a large amount of it is lost when they’re cooked in water.

In fact, boiling reduces vitamin C content more than any other cooking method. [Broccoli](https://www.healthline.com/nutrition/foods/broccoli), spinach, and lettuce may lose up to 50% or more of their vitamin C when boiled.

Because vitamin C is [water-soluble](https://www.healthline.com/nutrition/water-soluble-vitamins) and sensitive to heat, it can leach out of vegetables when they’re immersed in hot water.

B vitamins are similarly heat sensitive. Up to 60% of thiamine, niacin, and other B vitamins may be lost when meat is simmered and its juices run off.

However, when the liquid containing these juices is consumed, 100% of the minerals and 70–90% of B vitamins are retained ([6](http://www.ars.usda.gov/SP2UserFiles/Place/80400525/Data/retn/retn06.pdf)).

On the other hand, boiling fish was shown to preserve [omega-3 fatty acid](https://www.healthline.com/nutrition/17-health-benefits-of-omega-3) content significantly more than frying or microwaving ([7Trusted Source](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3550962/)).

**Summary**

While water-based cooking methods cause the greatest losses of water-soluble vitamins, they have very little effect on omega-3 fats.

**Grilling and broiling**

Grilling and [broiling](https://www.healthline.com/nutrition/broil-vs-bake) are similar methods of cooking with dry heat.

When grilling, the heat source comes from below, but when broiling, it comes from above.

Grilling is one of the most popular cooking methods because of the great flavor it gives food.

However, up to 40% of B vitamins and minerals may be lost during grilling or broiling when the nutrient-rich juice drips from the meat.

There are also concerns about polycyclic aromatic hydrocarbons (PAHs), which are potentially cancer-causing substances that form when meat is grilled and fat drips onto a hot surface.

However, researchers have found that PAHs can be decreased by 41–89% if drippings are removed and smoke is minimized.

**Summary**

Grilling and broiling provide great flavor but also reduce levels of B vitamins. Also, grilling generates potentially cancer-causing substances.

**Microwaving**

Microwaving is an easy, convenient, and [safe](https://www.healthline.com/nutrition/microwave-ovens-and-health) method of cooking.

Short cooking times and reduced exposure to heat preserve the nutrients in microwaved food.

In fact, studies have found that microwaving is the best method for retaining the antioxidant activity of [garlic](https://www.healthline.com/nutrition/11-proven-health-benefits-of-garlic) and mushrooms.

**Summary**

Microwaving is a safe cooking method that preserves most nutrients due to short cooking times.

**Roasting and baking**

Roasting and baking refer to cooking food in an oven with dry heat.

Although these terms are somewhat interchangeable, roasting is typically used for meat while baking is used for bread, muffins, cake, and similar foods.

Most vitamin losses are minimal with this cooking method, including vitamin C.

However, due to long cooking times at high temperatures, the B vitamins in roasted meat may decline by as much as 40%.

**Summary**

Roasting or baking does not have a significant effect on most vitamins and minerals, except for B vitamins.

**USING THE FOOD TRIANGLE**

**EFFECT OF HEAT ON PROTEINS:**

* The change colour and harden
* On further cooking they soften
* Further moist cooking will disintegrate the fibers(denature)
* Further dry cooking will char the proteins

**EFFECT OF HEAT ONTO CARBOHYDRATES:**

* With Moist heat, the food will absorb the liquid
* Swells and doubles or triples in size
* Softens and becomes ready
* Further cooking will burst and release the starch
* The gels will settle on the bottom of the pan
* On further cooking it will char

**EFFECT OF HEAT ON FATS:**

* Fats are solid at room temperature
* Heat will melt the fats into oils
* On further heating the oils will reach the smoke point (ready to use)
* On further heating it will form a blue haze on top
* Further heating the oil will catch fire
* It will char

**EFFECT OF HEAT ON VITAMINS AND MINERALS:**

* Most of these are volatile
* Water soluble will dissolve in water
* Fat soluble will only be enhanced when using oil
* Some are sensitive to heat, they will disappear