



Nutritious Delicious Cooking Resources
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Pressure Cooking

There are several ways of cooking food; roasting, baking, boiling, microwaving, sautéing and frying to name a few. Pressure cooking is a method of cooking in a sealed vessel that does not permit air or liquids to escape below a pre-set pressure. Pressure is created at the beginning by boiling a liquid, such as water or broth, inside the closed pressure cooker and the trapped steam increases the internal pressure and temperature. After use, the pressure is slowly released so that the vessel can be safely opened. Pressure cookers now have safety valves that release pressure in case the normal pressure release mechanism is damaged.

Pressure cooking with a pressure cooker allows food to be cooked in a moist environment at a higher temperature than possible with conventional boiling or steaming methods. In an ordinary non-pressurized cooking vessel, the boiling point of water is 100°C / 212°F (at sea level) and, no matter how much heat is applied, it never becomes hotter because the water just evaporates into the air as steam. In a sealed pressure cooker, the boiling point of water increases as the pressure rises, resulting in superheated water above the normal boiling point of water, reaching a temperature of up to 121°C / 250°F.

Foods cook much faster with pressure cooking than with other methods and require much less water than boiling, so dishes can be ready sooner. Less energy is required than when boiling, steaming, or oven cooking. Since less water or liquid has to be heated, the food reaches its cooking temperature faster. Using more liquid than necessary wastes energy, because it takes longer to heat up and pressure cookers can use much less liquid compared to boiling or steaming in an ordinary saucepan.

The pressure cooker should never be filled to more than 2/3 its interior height with solid food, 1/2 full for liquids and foods that foam and froth, e.g., rice, pasta etc., and no more than 1/3 full for pulses e.g. lentils. A tablespoon of cooking oil can be added to minimize foaming.

The food is cooked at a temperature above the normal boiling point of water, killing most micro-organisms. A pressure cooker can also be used as an effective sterilizer, for jam pots and glass baby bottles, for example, or for water while camping.

It is not necessary to immerse food in water: The minimum quantity of water or liquid used in the recipe to keep the pressure cooker filled with steam is sufficient. Because of this, vitamins and minerals are not leached (dissolved) away by water, as they would be if food were boiled in large amounts of water. Due to the shorter cooking time, vitamins are preserved relatively well during pressure cooking.

The pressure cooker speeds cooking considerably at high altitudes, where the low atmospheric pressure otherwise reduces the boiling point of water, which reduces water's effectiveness for cooking or preparing hot drinks. Additionally, the increased temperatures due to pressure cooking are also used to promote the Maillard reaction to develop more desirable flavor profiles that would not be obtainable using temperatures typical of boiling. The flavours are more concentrated in the higher temperature and sealed environment of the pressure cooker, so less seasoning is required.

Source: Wikipedia and Intro. to Chem. (Textbook) by Zumdahl and DeCoste