



Safety about the Uses of Microwave Ovens

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فرع الادوية والسموم

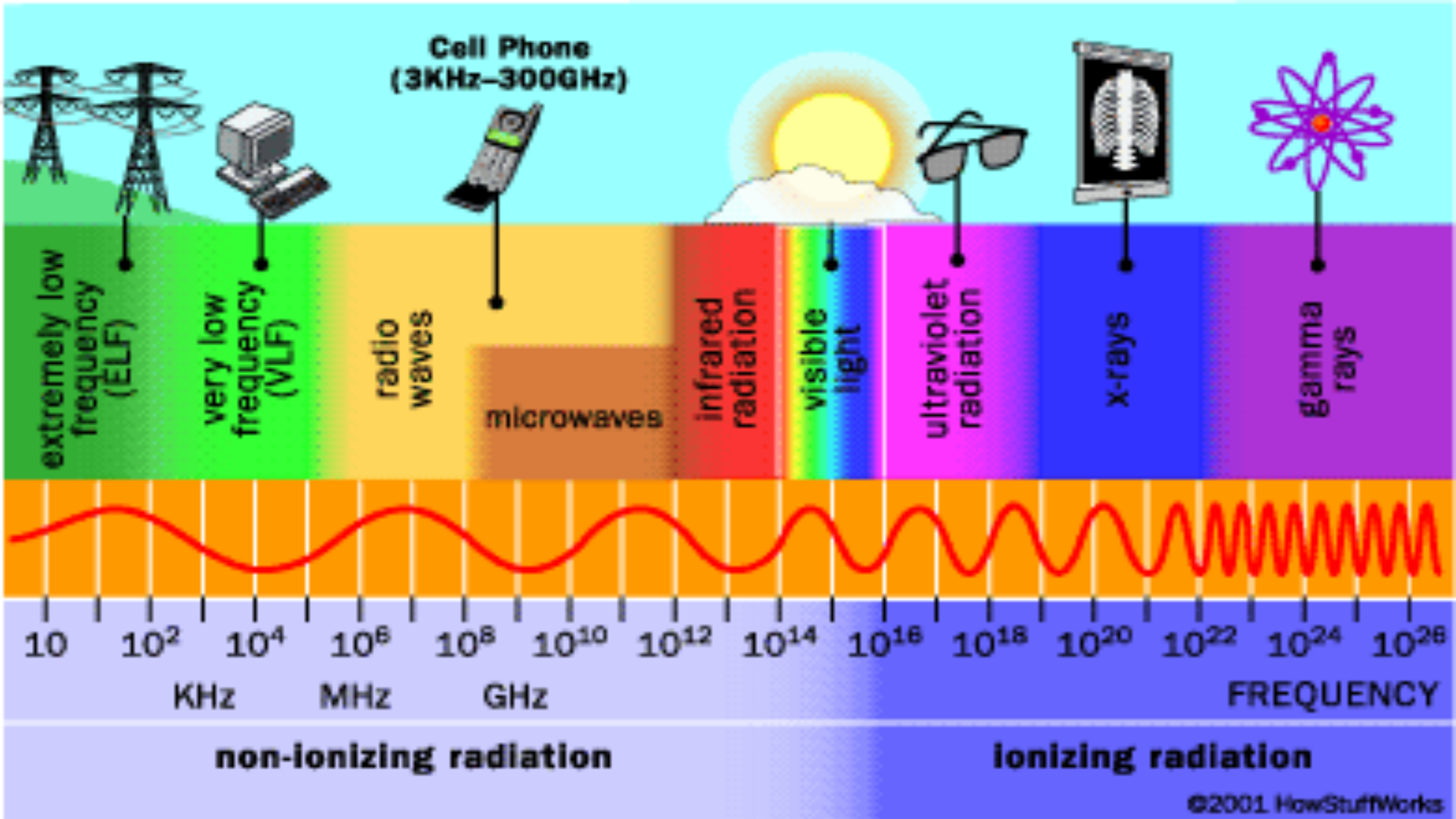
- Domestic microwaves have been used since the mid 1950's. Since that time there has been no credible evidence to suggest they are in any way harmful to human health in normal use.
- The risk of injury from microwave radiation is effectively non-existent.
- The main danger a microwave poses is fire resulting from misuse or malfunction.

- The Food and Drug Administration (FDA) has regulated the manufacture of microwave ovens since 1971.
- Microwave oven manufacturers are required to certify their products and meet safety performance standards created and enforced by the FDA to protect the public health.
- Based on current knowledge about microwave radiation, the Agency believes that ovens that meet the FDA standard and are used according to the manufacturer's instructions are safe for use

- Microwave ovens are a convenient means to heat food and are generally safe when used correctly. Microwave ovens heat food using microwaves, a form of electromagnetic radiation similar to radio waves.
- Microwaves have three characteristics that allow them to be used in cooking:
 1. they are reflected by metal
 2. they pass through glass, paper, plastic, and similar materials
 3. they are absorbed by foods.
- The microwaves reflect off the metal interior of the oven and cause the water molecules in food to vibrate. This vibration results in friction between molecules, which produces heat that cooks the food.

What is Microwave Radiation

- Microwaves are a form of "electromagnetic" radiation; that is, they are waves of electrical and magnetic energy moving together through space frequencies ranging from 300 MHz to 300 GHz.
- Electromagnetic radiation spans a broad spectrum from very long radio waves to very short gamma rays. The human eye can only detect a small portion of this spectrum called visible light. A radio detects a different portion of the spectrum, and an X-ray machine uses yet another portion.
- Visible light, microwaves, and radio frequency (RF) radiation are forms of non-ionizing radiation. **Non-ionizing radiation does not have enough energy to knock electrons out of atoms.** X-rays are a form of ionizing radiation. Exposure to ionizing radiation can alter atoms and molecules and cause damage to cells in organic matter.



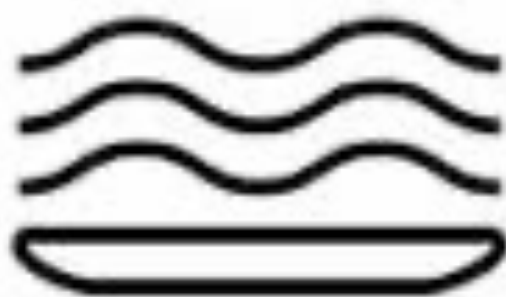
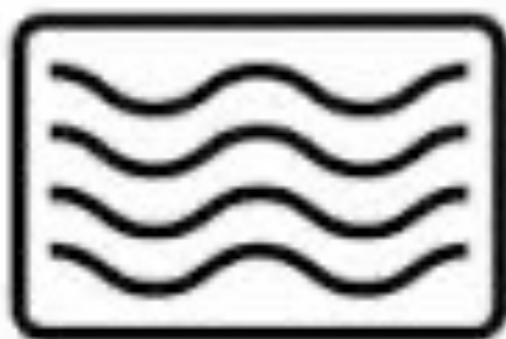
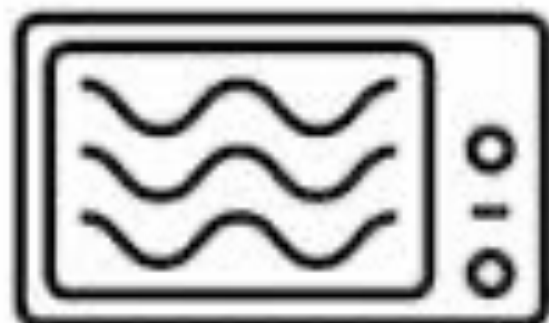
Cooking with Microwaves

- Microwaves are produced inside the oven by an electron tube called a magnetron. The microwaves are reflected within the metal interior of the oven where they are absorbed by food. Microwaves cause water molecules in food to vibrate, producing heat that cooks the food. That's why foods that are high in water content, like fresh vegetables, can be cooked more quickly than other foods. The microwave energy is changed to heat as it is absorbed by food, and does not make food “radioactive” or “contaminated.”

- Although heat is produced directly in the food, microwave ovens do not cook food from the "inside out." When thick foods are cooked, the outer layers are heated and cooked primarily by microwaves while the inside is cooked mainly by the conduction of heat from the hot outer layers.
- Microwave cooking can be more energy efficient than conventional cooking because foods cook faster and the energy heats only the food, not the whole oven compartment. Microwave cooking does not reduce the nutritional value of foods any more than conventional cooking. In fact, foods cooked in a microwave oven may keep more of their vitamins and minerals, because microwave ovens can cook more quickly and without adding water.

- Glass, paper, ceramic, or plastic containers are used in microwave cooking because microwaves pass through these materials. Although such containers cannot be heated by microwaves, they can become hot from the heat of the food cooking inside. Some plastic containers should not be used in a microwave oven because they can be melted by the heat of the food inside.
- Generally, metal pans or aluminum foil should also not be used in a microwave oven, as the microwaves are reflected off these materials causing the food to cook unevenly and possibly damaging the oven. The instructions that come with each microwave oven indicate the kinds of containers to use. They also cover how to test containers to see whether or not they can be used in microwave ovens.

MICROWAVE OVEN SAFE



microwaves leak radiation?

- Yes, it's true that some microwaves do leak radiation. Whilst radiation is a brilliant way to heat food, it's not great for humans. But don't panic just yet...there are strict limits on the amount that can leak from a microwave oven throughout its lifetime.
- You may not already be aware that other everyday items like your laptop and computers leak electromagnetic radiation, too and don't harm us. Like the microwave the levels of leaked radiation is far below the amount known to harm people.
- If you're still not satisfied, it's important to note that the level of exposure dramatically reduces as you move away from a microwave oven. If you want to be extra cautious, you can simply stand away from it whilst it's on. In the worst case scenario, microwave radiation at these power levels would result in a mild warming effect, if anything.

Microwave cooking and nutrition

- The majority of reports published on the nutritive value of foods cooked in microwave ovens indicate that food prepared in this manner is at least as nutritious as comparable food cooked by conventional methods.
- Most of these studies have concentrated on vitamin retention and indicate that cooking in minimal water for a reduced time, as occurs with microwaving, promotes the retention of the water-soluble vitamins particularly of vitamin C and thiamin.
- Microwave cooking is preferable to boiling to minimise the leaching of vitamins into the cooking water; in this regard it is similar to steaming. For the same reasons given for vitamin C, microwave cooking enhances mineral retention in vegetables.

- Studies have not revealed any non-heat related effects on the macronutrients of foods, proteins, fats and carbohydrates, when cooked in microwave ovens. There may be slight differences in denaturation rates of proteins when food is heated in a microwave oven compared with conventional heating but this is due to differences in the time and temperature to which the food is subjected.
- Recent reports reveal that cooking vegetables in a microwave oven leads to a greater loss of soluble phenolic antioxidant compounds than does conventional cooking.
- However, this appears to have been at least partly due to the use of more cooking water than is necessary with microwaves. The role of these phenolic compounds in human nutrition remains an open question.

- Far less information is currently available on the effect of microwave cooking on other food components such as carbohydrates, lipids and fat-soluble vitamins. The quality of protein is higher in microwaved than in conventionally cooked food as far less oxidation occurs in meat cooked in a microwave.
- Lack of browning is visible evidence that heating is gentler, and makes it likely that vitamins A and E are better retained than in conventional cooking. However, these differences are likely to be slight and of little nutritional significance.
- Reheating food quickly in a microwave retains more nutrients than holding food hot for long periods; this is significant in institutions and hospitals where food may be held hot for several hours in traditional catering systems.

- The nutritional value of food does not depend only on the way in which it is cooked. Just as important are shopping wisely for quality products, correct temperature control during storage and preparation and serving food promptly after it is prepared.
- Leaching effects aside, there seems to be little difference to the retention of nutrients between food cooked by microwaves or by conventional means, provided that cooking time and temperature guidelines are carefully followed.