

It is estimated that over a billion households worldwide own a microwave oven. **In Europe, for example, 80-90% of households have a microwave oven.** However, microwaves are also becoming increasingly popular in emerging countries. The reasons for this are their speed, convenience, energy efficiency, ease of use and versatility – characteristics that meet the demands of modern everyday life.

Modern **kitchen appliances such as induction hobs and microwave ovens are designed for speed and efficiency, but not for gentle food preparation** or risk-free, health-safe handling.

The microwave oven – a chance discovery

While American engineer Percy Spencer was working on magnetrons (high-frequency generators that produce microwaves and were originally used for radar equipment) at the US defence and electronics company Raytheon in the 1940s, he noticed that a chocolate bar in his trouser pocket melted during an experiment. He assumed that the microwave radiation had caused the chocolate to melt. The idea for the development of the microwave oven was born.

In the Soviet Union, microwave technology was also known at that time in the context of military research and radar technology. **The Soviet scientific community began early on to intensively study the biological effects of microwaves (e.g. changes in blood composition, effects on the nervous system) (Mcree, 1979).** Unlike in the West, the focus was not only on thermal effects, but also on possible non-thermal biological effects. The results led the USSR to set stricter safety standards than most Western countries.

Cell metabolism – understanding what happens in the body

All substances absorbed by the body (e.g. food, medication, environmental toxins) are broken down into

usable components by the metabolism so that cells can perform their tasks such as building, regenerating and detoxifying, and we can stay healthy. For these cellular processes, a balanced supply of nutrients is necessary. However, environmental pollution and an increasingly acid-forming diet disrupt the body's acid-base balance, making us susceptible to various diseases.

Technical electromagnetic fields (EMFs) (often colloquially referred to as 'microwaves') have a variety of effects on the body. For example, they can trigger mitochondrial dysfunction, disrupt calcium signalling, reduce antioxidant defences, activate cellular stress responses or even have local thermal effects (Dasdag & Akdag, 2015). The body responds to these changes by, among other things, forming free radicals. These are chemically unstable molecules that are missing electrons. The molecules attempt to compensate for the electron deficiency by 'stealing' electrons from other molecules, which then also become free radicals. A vicious circle, because this process causes oxidative stress, which impairs cell function and regeneration. **In high concentrations, free radicals can damage proteins, cell membranes and even DNA. This is particularly devastating when immune cells are affected, as it weakens the body's defence system.**

Free radicals can thus cause a variety of cell damage if they are not neutralised. This task is performed by antioxidants, which are vital for the human organism. A diet low in antioxidants can impair health in the long term and promote the development of so-called life-style diseases. **It is problematic that, of all things, these protective antioxidants in food are largely destroyed by heating in the microwave (Vallejo et al., 2003).**

As early as the late 1970s, forensic research on microwave radiation in the United States yielded alarming results. These findings confirmed the destruction of the nutritional value of food, the formation of carcinogenic substances and thus the direct biological effect of microwaves on human beings (Naval Medical Research Institute, 1971).

For example, heating or defrosting breast milk in a microwave oven leads to a significant decrease in immune-boosting proteins and antibodies in the milk – even at low temperatures between 20° and 53° C (Quan et al., 1992). At the same time, bacteria in the milk multiply much faster. Lubec et al. warned as early as 1989 that microwave heating of milk or infants' food structurally alters amino acids to such an extent that they can lead to immunological changes in their denatured form.

Heating food in the microwave can also release substances that are harmful to health: plasticisers and stabilisers from food-safe PVC or PVDC/PVC films (e.g. packaging and containers) are transferred to the food (Badeka et al., 1996).

Cooking in the microwave can cause cancer

Microwave ovens may only be operated when locked and shielded. Nevertheless, complete sealing is not technically possible, which is why the escaping leakage radiation is regulated by the same legally binding limits as mobile communications.

The microwave oven generates heat through the high-frequency and continuous polarity reversal (2.5 billion times per second) of matter and substances. This creates frictional heat, which 'cooks' the food prepared in the microwave. At the same time, the food structures (molecules) are unnaturally deformed and nutrients are destroyed, resulting in oxidative stress and immediate damage to structures and molecules. The chemical and physical properties of the food, as well as the balanced acid-base ratio that is important for health, are fundamentally changed.

The immune system reacts to damaged molecular structures as it would to toxins, namely with defensive reactions. This causes changes in blood values similar to those seen in the early stages of cancer (Fig. 1, please turn over).

The radiation in a microwave oven is therefore unnatural and harmful to health. At the end of the 1980s, scientific studies by biologist Dr Hans-Ulrich Hertel confirmed these processes in the body and thus the high danger of microwave ovens. His studies proved that heating or defrosting food and drinks in a microwave oven destroys their nutritional value and can cause damage to health:

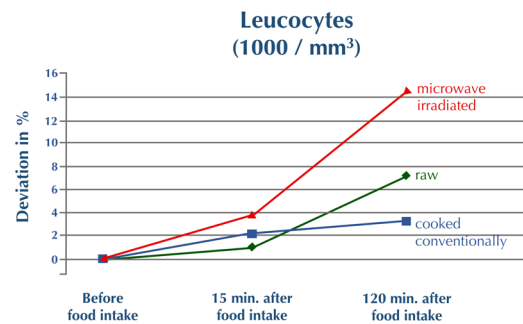


Fig. 1: Leucocytes (white blood cells) are primarily involved in defending against infections and tumour cells. The significant increase in leucocytes after consuming microwave-irradiated food (compared to conventionally cooked and raw food) indicates a greatly increased defensive reaction leading to inflammation (as in a cancer process) due to the immune system's reaction to these altered foods.

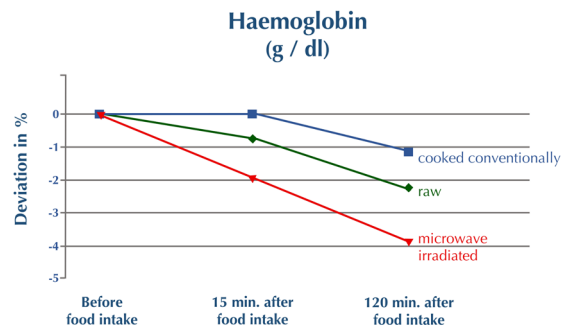


Fig. 2: Haemoglobin is responsible for transporting oxygen in the body. The more haemoglobin there is, the more oxygen is available to the cells. The figure shows that haemoglobin levels drop significantly after consuming microwave-irradiated food, which means a reduction in the oxygen content in the blood.

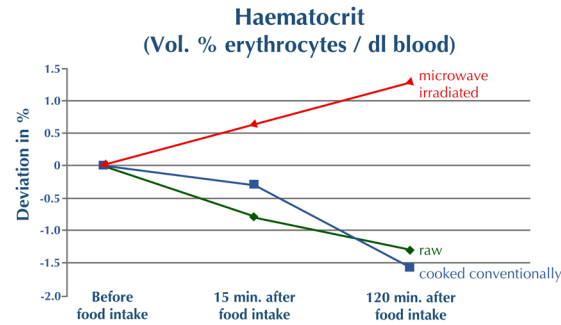


Fig. 3: Haematocrit signals the proportion of blood cells in the blood. This allows conclusions to be drawn about the fluidity and oxygen transport capacity of the blood. The thickening of the blood after consuming food heated in a microwave oven is significant and means that both blood flow and oxygen transport in the blood are impaired.

After consumption of food heated in a microwave oven, the body switches to defence mode, as evidenced by an increase in leucocytes in the blood. At the same time, oxygen uptake in the body decreases (reduced haemoglobin level), while the haematocrit value increases significantly, thereby also increasing the risk of embolism. **All three processes clearly demonstrate that consuming microwave food causes stress to the body and can lead to diseases such as cancer in the long term.**

Contrary to microwave ovens, traditional cooking methods on the hob, in the oven and in the steamer heat food naturally from the outside in, without friction or changes to the molecular structure and therefore without any health risks.

Everyone is responsible for their own health and that of their children, who are not yet able to make decisions for themselves. **So take action today and banish the microwave oven from your kitchen!**

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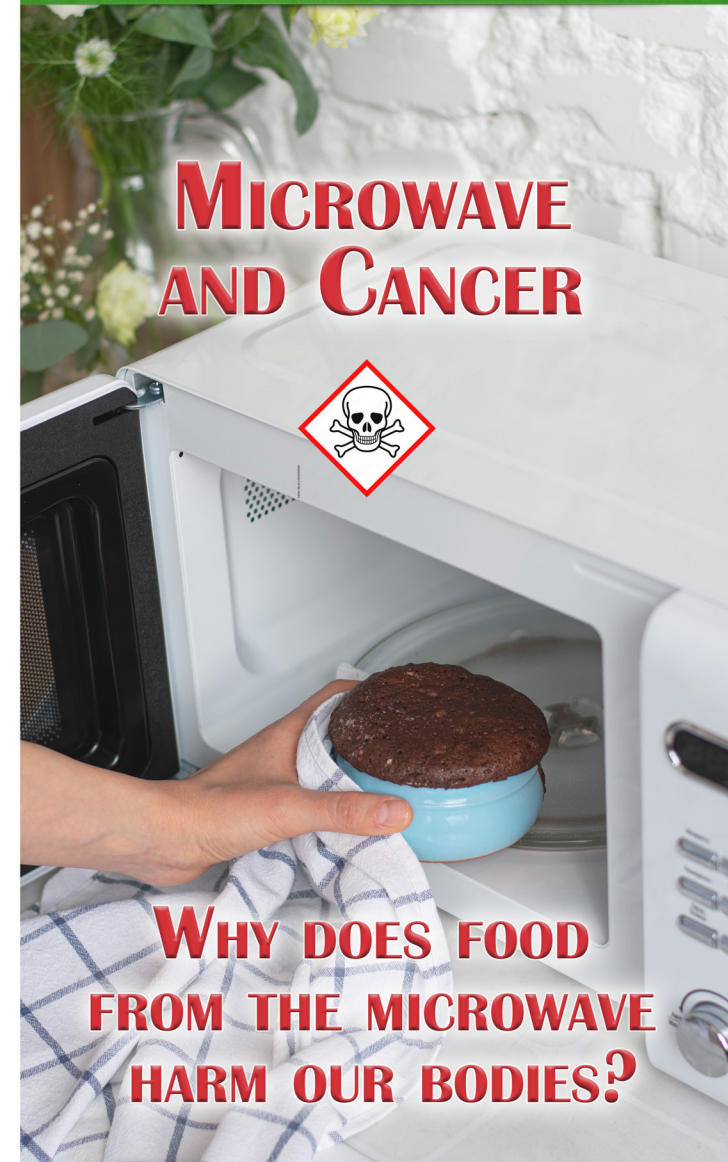
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05/26



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**MICROWAVE
AND CANCER**

**WHY DOES FOOD
FROM THE MICROWAVE
HARM OUR BODIES?**