

The Microwave

On October 8, 1945 the first microwave patent was filed by self-taught electrical engineer Percy Spencer. He worked for Raytheon, famous for their work on combat radar during World War II. Percy discovered the potential of microwaves for heating food after an accident involving a candy bar that melted in his pocket during an unrelated experiment for Raytheon.

In 1967, the first countertop microwave became available for purchase for approximately \$495. Fast forward to 2016. The microwave industry has reached profits nearing a trillion dollars and over 90% of all US households own a microwave.

Microwaves use high frequency waves called non-ionizing radiation. This type of energy vibrates the water molecules in food at the rate of 2.5 million times per second, resulting in rapidly heated food. Conventional cooking on a stovetop transfers thermal energy at a slow rate through the heating of outer material which transfers heat to the food inside. Any time you “cook” food you’re changing its molecular structure. Overcooking food by any means can rob food of vitality, enzymes, and nutrients. The question is, how fast do these processes occur inside a microwave oven and what effects do microwaves have on food?

The Microwave Effect

The “microwave effect” comes from a field of science called Microwave Chemistry. This field of science recognizes two things: organic reactions occur faster with microwave heating than with conventional heating and there are a number of reactions that occur with microwaves that don’t occur at all under conventional heating. Discussing a January 2001 study DNA And the Microwave, researchers at Penn State explained, “microwaves accelerate chemical reactions sometimes so much that the results are startling. If these chemical reactions can be sped up using a microwave for just a short period of time, the effects on food could be relevant.”

The mainstream consensus is that microwaves are safe, equal to other forms of cooking and have a negligible effect on foods through their unique production of heat. However, peer-reviewed evidence-based research is lacking and currently, long-term studies on microwave safety and their effects on human health don’t exist.

Three Reasons to Rethink Your Microwave

1. Plastics and Chemical Leaching

When my partner was diagnosed with cancer, our doctor gave us a handout advising us to dispose of plastic food storage containers, plastic wrap and plastic drinking containers. It also warned of the risks of using plastic to heat and store anything hot, especially in a microwave.

Plastics contain a myriad of hazardous chemicals like xylene, toluene, benzene, phthalates (softeners), polyethylene terephthalate (PET) and bisphenol A (BPA). When heated, plastics can off-gas chemicals into the air or transfer chemicals into porous substances like food. Dr Rolf Halden, a researcher at Johns Hopkins University, warned in 2004 against phthalates and heating plastics. “Phthalates are environmental contaminants that can exhibit hormone-like behavior by acting as endocrine disruptors in humans and animals. If you heat up plastics, you could increase the leaching of phthalates from the containers into water and food. In general, whenever you heat something you increase the likelihood of pulling chemicals out.”

What about microwave safe plastic dishes like the one I found in the raw dog food bag?

Microwave safe dishes should be labeled “leaching chemicals into your food at a slower reduced rate.” Frederick Von Saal, a biologist at the University of Missouri’s Endocrine Disruptors Group and an expert on BPA, says there’s “no such thing as microwave safe plastic. As you hear it, you degrade the chemical bond. You can’t see this happening. You can’t taste it, you can’t smell it.” If you choose to use a microwave, please don’t ever use any type of plastic.

2. Nutrients Are At Risk

Whether you’re thawing, warming or cooking food in the microwave, a variant amount of enzymes, trace minerals, amino acids and other nutrients are being depleted at a higher rate than during conventional cooking.

Rapid or prolonged heat destroys enzymes in most foods making them difficult to digest. This puts added strain on the pancreas and leads to extended digestion times. For example, the enzymes diastase and invertase rapidly break down when heated less than a minute in a microwave (Institute of Agriculture and Fisheries Research Center, 2015). In 2003 a Spanish study found that broccoli lost 97% of its antioxidants when cooked in a microwave. By comparison, steamed broccoli lost 11 percent or fewer of its antioxidants. According to Ashim Segdel of Tribhuvan University, Nepal, microwaving significantly affects the antioxidant activity of buckwheat. Antioxidants are important because they protect the body against cell damage and most importantly, disease.

People use the microwave to heat up frozen vegetables, sometimes leaving them in their plastic packages. Pet owners microwave vegetables to help soften their cell walls, making them more digestible for dogs. Vegetables and fruits are high in antioxidants and it’s important that we protect them against high levels of heat.

3. Protein Damage and Oxidation

Microwaves accelerate cooking and heat unevenly even when you’re using the defrost setting. When meat is heated too rapidly the carcinogen acrylamide can form. I’ve found studies that say microwaves don’t form acrylamide when cooking meats, and others that disagree. Oxidation of oils can be an issue when microwaving foods containing oils, including meat. When oils oxidize they become unstable, rancid and toxic.

A study of microwaved olive oil versus conventional oils performed at the University of Bari in Italy showed that microwaved olive oil had a higher level of oxidization than conventional heated oil and that oxidation occurred at a rapid rate.

Whether you feed your dogs a raw or kibble diet, meat is an important protein source for our dogs. As an advocate of feeding a raw meat diet, microwaving raw dog food for any reason completely negates the principles and overall nutritional benefits of feeding raw. It can also make bones splinter. If you feed kibble, microwaving further depletes its already poor nutritional value.

The Take Away

There’s an inadequate amount of research validating or discrediting the negative effects of microwave use or the effects of eating microwaved food on the human body. This lack of research doesn’t mean there isn’t a valid need for caution and in my opinion, avoidance.