

In A Bite with Charlotte Mei

Microwaving food - potentially the best cooking method

Full Transcript

CHARLOTTE: Hello and welcome back to another episode of In A Bite! If you're new here or are simply interested in food and nutrition, don't forget to follow the channel. And if you're listening on Spotify, click on the bell icon to be notified each time a new episode is released. If you have any thoughts or questions about what I share in this episode, send it across on Instagram or via email and I'll address it in the upcoming tidbits episode. All contact details can be found in the episode description.

I love cooking! It's fun, it's a creative outlet for me and it's rewarding! And as you know, there are different ways of cooking: baking, steaming, grilling, stir frying, or even microwaving. The microwave oven has oddly become the kitchen appliance that many people have become hyper cautious of.

Now, I grew up hearing things like, “don't stand in front of the microwave oven, it's dangerous”... or “microwaving food makes it radioactive and harmful to health”, or that it “zaps away the nutrients in food”. So as you can tell, I had this idea that the microwave was some kitchen shortcut that was bad for you, and I stayed far away from it.

It wasn't until year two or three in uni when my lecturer, Ms Megan Povey, touched on microwaves and finally cleared out all the myths I had about the appliance and the science behind it. I remember that she said so nonchalantly that microwaves are not bad for you and can even be the most useful cooking appliance out there.

Now, this is one of the first few topics that came to mind when I started thinking about having my own podcast on food and nutrition, and I'm really excited to finally be able to do it.

So, let's talk about the “mee-cro-wah-veh”, shall we? What's the deal with it, and do we have reasons for being cautious of it? If you listen to episode 1 on MSG, you're going to realise that there are some similarities here. It so happens that people don't believe the facts about microwaves the same way that they don't believe the facts about MSG.

Both of these topics have clear science behind them, but somehow something about the human condition makes us illogical about these things and way too stubborn to accept the facts. We want to stick with what we're most comfortable with, and most of the time, these beliefs stand in the way of convenience and in my opinion, perfectly good food. So I did some thinking, and perhaps this has to do with the idea of something being too good to be true.

I mean, to be fair, we're talking about an appliance that can heat up what would usually take 30 minutes on the stove in 3 to 5 minutes. So, something must be up, right? Now, let's break all this down.

As mentioned before, there are about three main concerns when it comes to using microwave ovens.

1. It makes food radioactive and hence harmful to human health.
2. It's dangerous to be around as it releases radiation.
3. It destroys nutrients in food.

But before I get into any of that, let's first talk about how microwaves work. They function by generating microwave radiation. Now, don't let the term radiation scare you. When people hear the word they immediately think, "danger and destruction", and associate it with things like causing cancer.

But here's the thing, there are 2 types of radiation out there: ionising and non-ionising radiation. And one of them is much, much stronger than the other. Ionising radiation can cause chemical changes by breaking chemical bonds, and this causes damage to living tissues. Non-ionising radiation, on the other hand, has much lesser energy. Just enough to excite molecules and cause them to vibrate.

And this is exactly what happened to food that gets heated up in a microwave. Microwave radiation is a non-ionising radiation that bounces around the metal box, which we know to be our microwave oven. Say there's a plate of food in there. The microwaves get absorbed into the food and the energy gets transferred onto the water molecules in the food, causing them to vibrate, thereby generating heat.

It's like rubbing your hands together. Do it for a while and you start to generate heat. Continue that for a while, more at a higher rate, and you'll create even more heat.

So the same thing happens when the water molecules within a food vibrate. Over time, they generate enough heat to warm up an entire plate of food. And this happens really quickly.

And it's specifically water molecules that I'm speaking about because they easily absorb microwaves among all other types of molecules. And this is why foods that have a high water content like vegetables can be cooked more quickly than, say, a chicken fillet.

So to go back to the first concern... No, microwave ovens do not cause your food to be radioactive or harmful to health.

And this brings me to the next point. Is it dangerous to stand in front of the microwave?

I remember hearing this as a kid. “Whenever a microwave is operating, don't stand anywhere near it.” I assume as for fear of receiving any radiation from it? As mentioned previously, microwave radiation is non-ionising, so it does not have enough energy to destroy our tissues or affect it in any way.

Having said that, though, if one is exposed to extremely high levels of microwave radiation for a long period of time, it can cause a burn. And this is the one proven effect to happen in humans. What it does is heat up body tissue the same way it heats food. And the susceptible parts of the body are those that have low blood supply and thermal regulation, like our eyes.

That said, this is very rare. And as I mentioned earlier, it is caused by exposure to extremely large amounts of microwave radiation. And this is near impossible unless someone has gone through all the trouble of modifying a microwave oven.

And this is because of the way the appliance is engineered. Microwave ovens are designed such that two main things happen. First, the oven only operates when the door is shut. The minute you open it the appliance stops and it won't function. Secondly, the microwaves are contained within the oven itself through what is called the Faraday cage.

If you have a microwave oven at home, walk over to it right now and have a look at the door from the inside. You'll see a mesh of black spots all over it. Now, this is the Faraday cage. It basically acts as a shield to block out microwave radiation. So you can think of this as a sieve with holes so small that a microwave can't pass through. Essentially, you can see through it and observe your food rotating away on the microwave plate while staying safe from any microwaves slipping through.

But of course, to ensure that these two things are functioning as they should make sure that the seal on your microwave doors are clean so that they close properly as they should. And check that the Faraday cage isn't resting or peeling away. And this is why manufacturers indicate never to use any scouring pads or abrasives to clean the door.

So if you've been owning the same microwave for a long, long time, please go check up on it to make sure that it's still safe to use.

And now onto the final point, the impact microwaving has on the nutrient contents and food. The TLDR of what I'm about to say is that microwave food is practically the most nutritious way to cook food. Yep, you heard it right. As the great Dave Chang puts it, a microwave oven is basically a high tech steamer,

Before going into the part of nutrient losses, I'm just going to take a few steps back. Aside from the two general concerns that I just mentioned, microwave ovens tend to have a bad rap, but this is because of the types of food that were heated up with, back in the day. I'm

talking, frozen meals, ready to heat dinners. I mean, foods that were high in saturated fat, sodium, and tended to be low in fibre. So, not much nutrition in there

But if you chuck a balanced plate of food into the microwave, you're certainly not zapping off any nutrients in there. I get weird looks whenever I say this, but microwaving is a nutritious way to cook food because it retains nutrients more than anything.

For example, when we boil vegetables, the water soluble vitamins like vitamin C, leach out into the water. Also, when you expose food to high heat for a prolonged period, nutrient losses are increased. Now, with microwaving food, not only are you able to cook vegetables without the use of water, which basically prevents leaching of nutrients, but cooking takes place much quicker than over the stove. So this minimises losses of any other nutrients.

And adding to that, when we do things like grilling, searing, baking or roasting in high heat, foods may burn in carcinogenic compounds may form. Thing is, you can't char in a microwave oven so these compounds don't form. And this is exactly why it's also said by scientists that microwaving food may be the safest way of cooking food, hence the comparison to steaming food.

Now to all my foodies out there, the downside to using a microwave oven is that you won't be able to achieve a crispy texture or get any Maillard browning to happen. That said, if you're cooking something like say, a fish fillet or chicken thighs, you can easily get texture and colour by finishing it off in a pan for a couple of minutes.

In fact, I'm going to reference David Chang again here. One of his most popular recipes is his 10-minute Tingly Microwave Chicken. So in this recipe, he pops chicken thighs into a bowl and chucks them into the microwave for a couple of minutes just until the kitch... the kitchen?! Just until the chicken is about halfway cooked. And with it's still slightly pink in the middle he uses kitchen scissors to cut up the chicken in the same bowl and then adds them into a wok or pan to season and finish off the cooking. If you want the recipe to try this out, I've added it in the show notes.

And by the way, you can do this with fresh or frozen chicken thighs, which is one of my favourite parts about a microwave. You can defrost food in it to! And if you're like me and you like steamed fish, you know that Asian style with ginger and soy sauce?

Dave Chang says that he grew up seeing his parents put an entire fish into the microwave to steam and then finish off with the rest of the sauces. So, talk about making delicious food in a jiffy and doing away with handling raw meat.

Now, I haven't tried any of these methods yet because my kitchen is just too small to have a microwave oven but I'm all about it! Because I'm really particular with cross-contamination between raw and cooked food. So this is a massive win, a massive win for saving time for prep and cleaning up

Just one very important thing to take note of when solely using the microwave to cook your food. Make sure that your food is cooked through completely. The thing about microwave ovens is that food is heated from the outside in. So what may appear cooked on the surface is not necessarily cooked inside.

A perfect example to illustrate this is when heating up a bowl of soup. If you've done it before, you've most likely have realised that though the soup may feel hot on the surface and also the sides of the bowl when you touch it. Once you stir it up, the centre is still cold.

And this is why it's important to heat in intervals, stirring your food in between. So just mix it up and make sure that all parts of it are heated completely.

So there you go. I know I've thrown around many things about the microwave oven just then, but this is my big PSA to all of you listening: If you own a microwave oven, use it! Use it to your advantage! To save you time, to minimise cleaning up and retain nutrients in your food. Don't let it be a white elephant in your kitchen

If you know any other family members that own a microwave oven but don't touch it because they have the beliefs that I've just mentioned previously... please, please, please send this episode to them!

Now, as I mentioned earlier, I don't have a microwave in my home due to space constraints, but it's definitely going into my next kitchen. For me personally, it's going to come in super handy when defrosting meals, handling raw meats that I really don't like doing, or heating food up quickly without having to turn on the gas stove. And besides, it can also be more energy efficient than conventional cooking. I mean, don't chuck in an entire chicken in there, but you get what I mean.

And just a little note to any of my uni friends that may be listening in and wondering if I got Povey's name wrong. Well, back in 2017 our dear professor and food physicist, Povey, embraced her identity as Meghan. I can't remember again how I got to know about this, but I recall having felt really emotional when I read the news because I came to realise that all this while she had been existing in an identity that she didn't feel herself in.

And as you can imagine, this can feel really lonely and tiring. So I'm really happy for her that she has now done this for herself and continues the amazing work she has always been doing at the University of Leeds. So Ms Povey, if you're listening, this is a huge shout out to you.

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