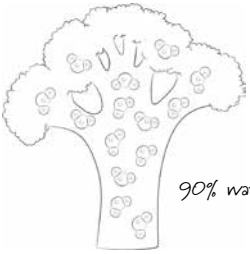
Tips & Techniques

Microwaves

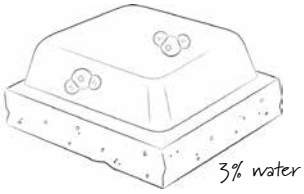
Sage®

It's all about water ...

It's the water inside food that is mostly responsible for the generation of heat.



More water cells means heat transfers more quickly



Less water cells means heat transfers more slowly

The electromagnetic waves cause the water molecules to vibrate and crash into surrounding compounds causing the food to heat, as if from the inside out. And *this*, is what makes microwaving so tricky. Why? Because, as you've probably heard before, foods differ enormously in their water content. Vegetables for example, are made up of about 85% to 95% water. Meats are about 70%, and butter is less than 20. And, believe it or not, most cooking chocolate is only about 3% water! So if microwaving is all about the water, and different foods vary from as low as 3%, to as high as 95% water content, then, as you can imagine, different foods behave very, very differently in a microwave. And this is why adjusting the amount of microwave power you apply is critical when you heat foods with higher or lower water contents.

Typically, the higher the water content, the higher the amount of microwave power you can apply and still heat the food reasonably evenly. The more water, the more even the spread of heat typically becomes, as there is more agitation of the water molecules and better conductivity. But when there are fewer water molecules within the food, the agitation happens in more concentrated pockets and it takes longer for the heat to conduct. To heat these lower water content foods evenly, you need to create less agitation of the molecules and give the heat more time to conduct into the food or you'll often get burnt edges, explosions, and other undesirable chemical reactions.

So, there are lots of foods you can't simply 'zap' in the microwave on high. Selecting the right power level is critical to achieving an even result.

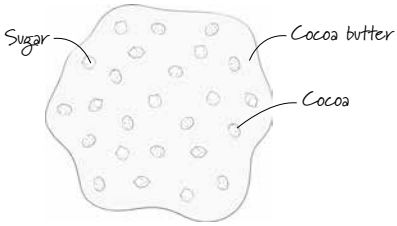
Different ingredients need different levels of power and different cooking times so ensure you select the right power setting for what you're cooking, and adjust the power if it looks like the edges of the food are cooking much faster than the rest.

TIP

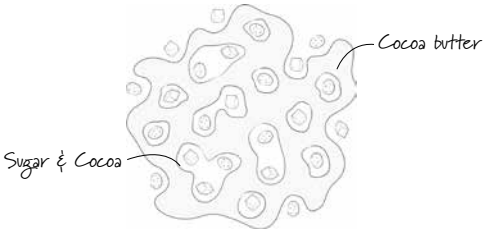
It is recommended that you heat lower water content foods on much lower power settings. Make sure you select an appropriate power level for the ingredients you're cooking and adjust the power level whenever you see uneven heating on the food's surface. Some microwaves make adjusting power quite tricky. But, the Sage Quick Touch™ lets you adjust power and time at any stage during the cooking cycle, simply by turning a dial. You'll be surprised what a difference it makes!

Melting Chocolate

Believe it or not, chocolate is largely responsible for the invention of the microwave oven.



Chocolate is a suspension of sugar and cocoa particles in cocoa butter



When overheated the fat separates from the dry particles turning the chocolate dull and lumpy

In the wake of World War II, scientists were testing magnetrons in hopes of creating better radar detectors when an engineer named Percy Spencer noticed the chocolate bar he had in his pocket began to melt. From this he quickly realised that magnetrons could potentially be used to cook food and the beginnings of the modern microwave were born.

Using the microwave is still one of the most effective techniques when it comes to melting chocolate, but the confectionary's unique characteristics tend to make people wary of working with it.

Chocolate is technically an emulsion, or a mixture of liquids that would otherwise naturally separate. The sugar, fat and starch molecules are held together by the emulsifier lecithin, but this bond is extremely fragile and can be easily upset. Most recipes which use chocolate require melting it first, but if the heat is too high it can make it split or "seize", go grainy or burn and because cocoa butter has a melting point below body temperature (around 34°C) you can go from chocolate to chalk in a matter of seconds!

Most people use a double-boiler (bowl over a pan of hot water) to melt chocolate but if you're not watching, or a bit heavy handed with the heat, the water from the saucepan below can bubble over into your chocolate causing it to seize.

This is because the process of refining cocoa beans into chocolate removes all the moisture making the final product incredibly dry, even in its melted state. Adding the smallest bit of water to melted chocolate is just like adding water to flour and you end up with a paste.

TIP

Provided you don't cover the bowl and allow condensation to drop in, microwaves can be very effective at melting chocolate as they eliminate the risk of seizing it with liquid. However, chocolate's low melting point means you have to heat it gently to prevent it overheating, which in most microwaves means keeping your eye on it and stopping to stir every 30 seconds.

The Sage Quick Touch™ has a 'Melt Chocolate' setting which calculates the correct power level and time based on how much chocolate you are using so you don't have to stay glued to the microwave. Because chocolate is a poor conductor of heat you will notice a few semi-formed pieces in the bowl at the end of the cycle which can be combined by stirring with a metal spoon.

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