

Cooking Methods

Food + Heat = Cooking



Why DO we cook food?

No other animals cook food before consuming it.
So why do we?



Why DO we cook food?

Cooking food allows us to break down the nutrients contained within, and more easily absorb them into our bodies.

This allows us to gain a lot of energy and nutrients in a relatively short time, and plays a big part in shaping our society.



Why DO we cook food?

Cooking has evolved a lot over the years and we don't just cook for purely nutritional benefit anymore.

Cooking allows us to control taste, texture, visual appeal and more, and understanding the different methods of cooking is the key to knowing how.



Types of Heat Transference

There are 3 basic types of heat transference used in cooking.

They are:

- Conduction
- Radiation
- Convection



Types of Heat Transference

Conduction

Conduction is the transfer of heat through direct contact.



Types of Heat Transference

Convection

A little bit more complicated, convection happens when heat gets transferred through a fluid or a gas.

Convection actually combines conduction and a mixing effect when the molecules in a fluid (air, water or fat) move from a warmer area to a cooler one.

There are actually two types of convection: Natural and Mechanical



Types of Heat Transference

Natural Convection

Natural convection occurs when the warm molecules rise, and the colder molecules sink. This creates a natural current distributing heat throughout the liquid or gas.

Mechanical Convection

Mechanical convection follows the same principles as natural convection, but uses a mechanical device to assist the distribution of heat. Stirring a pot of liquid, or a fan in a convection oven are examples of mechanical convection.



Types of Heat Transference

Radiation

Radiation is different from the first two methods because it doesn't require any contact between the heat source and what you're trying to cook. Heat waves or light waves radiate out from the heat source striking and penetrating the food.

Unlike conduction or convection, the heat produced by radiation travels in all directions, rather than just rising.



Types of Heat Transference

All cooking methods will use at least one of these methods of heat transference, and most will actually use more than one.

Since most cooking uses multiple types of heat transference, it's easier if we break our cooking methods into some different categories.



Cooking Methods

Despite of all of these different types of heat, we can basically only cook food in air, fat, water and steam, which we call the cooking mediums.

Knowing this, we can separate our cooking methods into these groups:

- Dry Heat Cooking
- Moist Heat Cooking
- Combination Cooking



Cooking Methods - Dry Heat

Dry-heat cooking methods are those that utilize air or fat.

Dry-heat cooking typically involves high temperatures, meaning 300°F or hotter.

Foods cooked using this method have a rich flavor due to the caramelization and browning that occurs because of these high temperatures.

Cooking Methods - Dry Heat

It might be strange to think of fat as a dry heat cooking method since fat is often a liquid (like oil), but it **is** considered a dry heat. So why is that?

While we often think of any liquid as being wet, this isn't always the case. Consider mercury. We probably wouldn't call it wet.



Cooking Methods - Dry Heat

Wetness can actually be somewhat hard to define as a concept, and doesn't really have a fully satisfying answer.

For our purposes though we can think of it like this. Wetness (or moisture) in cooking essentially means water. Since oil not only contains no water, but is in fact hydrophobic, we can think of it as being dry.



Cooking Methods - Dry Heat

Dry heat cooking methods consist of the following cooking methods:

- Grilling
- Broiling
- Roasting/Baking
- Sautéing
- Pan-frying
- Deep-fat frying
- Searing



Cooking Methods - Moist Heat

Moist-heat cooking methods are those that use water or steam.

Because moist heat involves water, the temperatures will generally not exceed around 212°F. Beyond this point water will turn to steam and escape. Steam can be heated to much higher temperatures, but only if pressurized.

This slower, lower temperature cooking emphasizes the food's natural flavours.



Cooking Methods - Moist Heat

Moist heat cooking methods include:

- Poaching
- Simmering
- Boiling
- Blanching
- Steaming



Cooking Methods - Combination Heat

Combination cooking methods are that incorporate both dry and moist heat cooking.

Dry heat cooking methods are used to establish caramelization, and then moist heat cooking is used to finish cooking the food.

Combination cooking is good for foods that need a longer time to break down, but still want the flavours obtained in dry heat methods.



Cooking Methods - Combination Heat

Combination cooking methods include:

- Braising
- Stewing
- Sous-vide

Dry Heat Methods

- Grilling
- Broiling
- Roasting/Baking
- Sautéing
- Pan-frying
- Deep-fat frying
- Searing

Dry Heat Methods - Air

Grilling

Grilling food involves cooking it suspended (by the grill) over a radiant heat source. Convection also plays a big role in grilling as the food is above the heat source. The grill itself is also a source of conduction, resulting in the characteristic grill marks.

Probably the most common form of grilling is barbecue, but other varieties exist as well.



Dry Heat Methods - Air

Grilling

Grilling is widely used because of the strong flavours created. Often times the heat source adds it's own flavours as well, resulting in complex flavour profiles. The smoky taste obtained from charcoal grills would be a great example of this.

Another big advantage of grilling is the ability to use both direct and indirect heat. This can allow for a wide variety of cooking.



Dry Heat Methods - Air

Broiling

Broiling food consists of cooking it with an overhead radiant heat at high temperatures. Most commonly this will be the broil setting on your oven, but other options exist.

Broiling food is sort of like the reverse of grilling. The heat comes from above and the food is below. Because heat rises though, there isn't really any convection happening, so it's even more directional.

Broiling is also often used as a way to finish off food. A short exposure to the high heat can be a great way to add browning to the top of a dish.

Dry Heat Methods - Air

Roasting/Baking

This method of cooking is used for its very even heating, the result of convection. Convection ovens use a fan (mechanical convection) to create even more even heating. Usually, the temperature for baking is determined more by the food being cooked than the technique, but like all dry heats rarely goes below about 300 F

Roasting and baking are essentially the same thing. Probably the biggest differentiation comes from the type of food being cooked. We usually think of roasting meats, but baking things like cakes and cookies.

Dry Heat Methods - Air

Roasting/Baking

Of course there are exceptions and nomenclature is always an issue. Compare a baked potato with a roasted potato, and you probably aren't thinking of the same thing.

One of the ways we can think of separating the two is that roasting often involves the addition of fat to promote additional browning. This isn't always the case though, and shouldn't be used as a distinction.

Dry Heat Methods - Fat

Sautéing

Sautéing involves cooking food in a small amount of fat at very high heats.

Because the heat is high, the food needs to move around a lot to avoid burning. Hence the name sauté. Usually this is accomplished by shaking the pan, but can be done with a spoon or spatula.

The high heat also means that the food shouldn't take long to cook. Smaller uniform pieces work best for this method.



Dry Heat Methods - Fat

Sautéing

Fats used for sautéing should be carefully selected. Because of the high heat, fats with a higher smoke point work a little better.

Many high flavour oils also lose a lot of their complex flavours at high heats. Don't waste money by using expensive flavourful oils for a sauté.

Dry Heat Methods - Fat

Pan-frying

Pan-frying consists of cooking foods at more of a medium-high heat, rather than the high heat of a sauté.

More fat is used for pan frying, usually enough to come up to about $\frac{1}{3}$ to $\frac{1}{2}$ of the way up the food.

Pan frying also usually involves little to no movement, excepting for a flip part way through the cooking.



Dry Heat Methods - Fat

Pan-frying

Pan-frying is great for breaded or battered things, as well as a variety of other foods.

While breading or coatings are common for both pan, and immersion (deep-fat) frying, the conduction provided by the hot pan provides additional caramelization and flavour for foods cooked via pan frying.

Dry Heat Methods - Fat

Deep- fat frying

Deep fat frying, or immersion frying involves immersing the food into a vessel full of hot fat (usually oil)

Once immersed, the oil will try to get into the food. However, the heat causes the moisture inside to turn into steam, and push back against the oil. Moisture moves from inside the food to replace the exiting steam, cooking the food from the inside.



Dry Heat Methods - Fat

Deep- fat frying

Proper fat heat is really important for good results when deep frying. Too hot and the food will burn, too low and the oil will seep into the food, resulting in a greasy mess.

Fried food cooks very fast, and works best with high starch foods, that are uniform and even, or foods that have a coating to protect them from the hot oil.



Dry Heat Methods - Fat

Searing

Searing consists of cooking food in a pan with a small amount of fat, and little to no movement. Unlike sautéing or frying however a wide range of heat can be used.

Searing is desirable because of the browning that occurs, and works best with thin flat foods. If the food is thicker another cooking method may be required to finish it off.

Dry Heat Methods - Fat

Searing

Searing works best with a vessel that can hold its heat. The most ideal pans for searing are made out of cast iron, but other types exist as well.

Contrary to popular belief, searing doesn't "lock in the juices" or anything of the like. Food actually loses more moisture to searing than other methods, but the flavour is worth it.

Dry Heat Methods - Fat

Frying vs Searing

While the definitions provided here will provide you with a good understanding of some basic cooking methods, they aren't always written in stone. The different types of cooking done in a frying pan take some different names.

Though searing is presented here as a method of cooking, it is sometimes viewed as more of a technique to apply to cooking methods. Pan frying (as presented here) is sometimes called shallow frying, and searing (as presented here) is called pan frying (which may or may not involve more fat)



Dry Heat Methods - Fat

Frying vs Searing

Aside from these different definitions, there are a lot of ways to cook something in a pan, and it's not always easy to label them.

What is important is to understand what you want to do to the food, and what different cooking methods will give you. After all, pan-fried or shallow fried, it still tastes good.

Moist Heat Methods

- Poaching
- Simmering
- Boiling
- Blanching
- Steaming



Moist Heat Methods - Water

The Liquid

One of the major differences between moist heat cooking methods is the temperature. As the water gets hotter, the method changes and becomes more or less suitable for different foods.

In most moist heat methods, you can also replace water with another liquid to add additional flavour.



Moist Heat Methods - Water

Poaching

Poaching consists of cooking food gently in a liquid that is just starting to move, but is still free of bubbles. This temperature is usually thought of as being between 160°F and 180°F.

Poaching is well suited for things like fish, eggs and chicken breasts, since they take advantage of the gentle heat, and lack of movement in the liquid to keep their shape and not break down.

Moist Heat Methods - Water

Simmering

Simmering consists of cooking food at temperatures just before a boil, usually 185°F to 205°F.

Simmering provides more heat than poaching does, but continues to have little movement, thus preventing food from moving around too much.

Simmering is a great way to get flavour out of food, for things like soups and sauces, stews and meats.



Moist Heat Methods - Water

Boiling

Boiling consists of cooking food in water at that has reached a boil, at a temperature of 212°F.

Because of the higher temperature and increased movement promoted by the boil, this method delivers the most heat the most quickly or our water based heats. It is ideal for foods that can handle this increased heat and take advantage of the movement.

Pasta, for example, is a great candidate for boiling because the water will wash away excess starch as it moves around.



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Moist Heat Methods - Water

Blanching

Blanching involves cooking food in boiling water, but only for a short period of time, and then transferring it to an ice bath to stop the cooking process. By doing this, the food stops cooking before it turns to mush.

Commonly used for fruits and vegetables, blanching can help brighten food, release unpleasant flavours, and even be useful for removing peels of skins.



Moist Heat Methods - Steam

Steaming

Steaming food involves cooking food by passing steam over it, usually using a steamer or double boiler.

Steaming is great for delicate foods that want the heat obtained by boiling water, but don't want to deal with the movement associated with it.

Another advantage of steaming is that it doesn't wash anything off the food, which can be desirable.

Combination Heat Methods

- Braising
- Stewing
- Sous-Vide



Combination Heat

Braising

Braising food involves searing or pan frying food to develop browning, and then finishing it off cooking it in liquid, usually enough to cover the food about 1/3 of the way up.

Braising is great for foods that need a longer cooking time to break down, but which still benefit from browning. Braising also keeps the foods whole as opposed to stewing, where they break apart.



Combination Heat

Stewing

Stewing food involves browning foods by searing or pan frying, and then finishing them off by simmering them in liquid.

Unlike braising, the liquid covers the entirety of the food and helps to break it down while cooking. Stewing is best served by evenly cut up pieces of food.



Combination Heat

Sous-Vide

Sous-vide is actually a rather modern technique that takes advantage of modern technologies.

In sous-vide cooking, food is encased in a sealed water tight contained and immersed in a water bath to be heated to precisely the perfect temperature.

Once the food has reached the ideal temperature it is removed from it's packaging and finished off with a dry heat method to provide browning.



Combination Heat

Sous-Vide

Sous-vide is desirable because the food has little exposure to an outside environment while cooking, thus maintaining a very natural flavour.

Many high end steaks are prepared in this manner since they can emphasize the quality of the meat.