

Sous Vide Cookery and Accurate Thermometer Temperature

Sous vide cookery – otherwise known, particularly in the United States, as ‘Cryovacking’ - is a revolutionary cooking method first popularized in the eighteenth century by the then Count Rumford, Sir Benjamin Thompson. However, this experimental method was forgotten for over a century, only rediscovered during the craze for innovative cooking methods during the 1970s. Although engineers had by then been using the method to preserve food for around ten years, when George Pralus began using it in 1974, he drew a landmark in the journey of innovative food.

Pralus was driven by the need to reduce the amount of foie gras lost when cooking: this pâté typically reduces by 20-30 %, but with the right thermometer temperature controlled sous vide cooking can retain most of that, with the foie gras only losing around 5% of volume – an enormous saving of money and maximization of flavour. Nowadays, sous vide is enthusiastically used by cutting-edge chefs such as Heston Blumenthal, Paul Bocuse, and Michael Carlson, having gained extra impetus from the scientific cooking revolution which took place in the 1990s, starring Blumenthal and other high profile chefs such as Thomas Keller. In particular, it's become a trademark of Ferran Adriá, founder and head chef at Spain's prestigious El Bulli restaurant. Influential food scientist Bruno Goussault has also heartily embraced *sous vide*, for both efficiency and quality.

The sous vide method (the name in French means ‘under – or ‘subjected to’ - a vacuum’) involves sealing food in airtight plastic bags, in a water bath. Using a high-precision thermometer temperature is accurately determined - it should be around 60 degrees centigrade/ 140 degrees Fahrenheit – and the food is cooked for up to 72 hours. It takes its name from the fact that the food is literally ‘vacuum packed’ – at up to 20 pounds of pressure per square centimetre. The osmosis of substances that this pressure causes means that, for instance, a chicken cooked with sage seasoning will be imbued all the way through with the flavour of the sage, which will mingle with the meat's juices. Like a rather more advanced form of poaching, sous vide cookery retains the subtle flavours of food.

Food cooked this way is left more succulent because the lower temperatures mean that the cell walls in the food do not burst and disperse the flavour in ‘juices’ which can easily be lost. In particular, vegetables cooked sous vide are left thoroughly cooked but firm to the taste. It is also useful for cooking meat very evenly – avoiding the ‘burnt outside/ raw inside’ effect that inexpertly cooked food can have. Perhaps most dramatically, sous vide cooking can be used to preserve a fish and start to cook it as soon as it is reeled in and before the process of rigor mortis, which wears down and disperses the enzymes and proteins within the flesh, sets in. Members of the ‘raw food’ movement have long argued that excessive cooking makes food less efficient nutritionally, but most people shun the idea of completely raw food: meals cooked *sous vide*, cooked evenly throughout but retaining nutrients and taste, could well be the answer.

But it's not just high cuisine which the sous vide method is used for – it's also an excellent way to preserve food (for instance, beef cooked *sous vide* gains a shelf life of up to 60 days!) It allows for the transfer of rare food items across the world (Goussault used it to develop a first class gourmet menu for France's express train service), is great for feeding large groups of people, and has been used to help disaster victims in scenarios where cooking facilities are missing or dangerous. And it's great for provision to developing countries, as it can easily be cooked with even weak solar power, at a far lower temperature than usually necessary.

If sous vide had been practiced widely when it was first invented, back in 1799, it would have been an unsafe method of cooking. But thanks to the advent of the high-accuracy kitchen thermometer temperature can now be controlled in a precise way

that excludes the danger of retained bacteria (such as salmonella). The precise control which a thermometer temperature reading provides is used to track the different temperatures and times needed for cooking different foods *sous vide*. However, expectant mothers should still avoid food cooked *sous vide* – and it should only be eaten in reputable restaurants whose thermometer temperature control is impeccable.

Nowadays, even amateur cooks can use *sous vide* cooking, thanks to innovative thermometer temperature control systems, such as PID controllers, which come with an attached thermocouple probe. For those who do not possess an accurate kitchen thermometer temperature control is more difficult: these cooks should stick to foods such as fish, which cooks *sous vide* equally well at 44 degrees centigrade as 61 degrees.

However, for the full *sous vide* menu an accurate thermometer temperature is needed: for instance, eggs cooked *sous vide* are very unsafe when cooked at the wrong temperature, due to its various proteins which coagulate at different temperatures. It's important to check the time and temperature required to pasteurize the food as well as to 'cook' it. Although those cooking food such as steak or eggs, which do not take long to be made edible, may think that they don't need a kitchen thermometer temperature accuracy may still be required to ensure that bacteria – including deadly botulism - has been removed through pasteurization.

The need for thermometer temperature control is most important of all when it comes to cooking meat. If your meat is cooked *sous vide* at less than 52 degrees Celsius, it may retain dangerous bacteria: a cook's worst bugbear. And if it's heated to more than 62 degrees, the proteins will start to disperse, losing flavour: this is called 'denaturing.' But with the right thermometer temperature can be controlled with an accuracy that leads to incredibly flavoursome dishes.

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