

SOUS·VIDE
AT HOME

The Modern Technique for Perfectly Cooked Meals

LISA Q. FETTERMAN
with Meesha Halm & Scott Peabody

INTRODUCTION

Most people are drawn to great food, but sadly far fewer enjoy cooking because they lack the experience, knowledge, or ability to make inspired dishes. I want to change that, which is why I founded my company Nomiku. (Nomiku is adapted from the Japanese *nomikui* [飲み食い], which means "eating and drinking.") At Nomiku, we're crazy about food, and our number-one mission is to help home cooks discover the same joys we have found in the kitchen. Cooking brings people together. It's the original social network. At Sunday gatherings over sweet-and-sticky ribs, we catch up with what's going on in one another's life. It is also fun to search your local markets for the best ingredients and then come home to craft dishes together. Constantly inventing new dishes and trying them out on one another is an art as well, one that we passionately pursue at Nomiku. And finally, cooking is entertainment. Preparing a meal at home can be as enjoyable as going out for dinner and a movie, because the act of cooking among friends is its own show.

But home entertaining is most fun when everything is under control. If you've ever tried to cook the perfect rosy medium rare steak, only to cut into it and find just the faintest hint of pink surrounded by gray, you know how disappointing it can feel. If you are cooking steaks for eight guests all at once and are not sure whether your steaks are raw or overcooked, you might wish you had gotten takeout instead. I feel for you. Before home immersion circulators existed, I'd often invite people over to socialize and just end up ordering in. Cooking for a group felt too complicated, and I was always a little worried about not getting things just right.

Now I can prep in advance, and when it's time to sit down to eat with my friends, it takes only a few minutes to put together a meal. Dinner is just waiting for me, bobbing away in the water bath, and I have the peace of mind knowing that it won't overcook because it is being held at a precise temperature. What's even better is that sous vide lets me get out of the kitchen and join my friends, rather than having to watch the stove constantly or worry that I need to get back to cooking. I couldn't imagine throwing a party without it.

Whether you fancy yourself an expert home cook or self-identify as a person who can't boil water, this book will grant you the secret password into sous vide, the greatest culinary invention of the twenty-first century. My goal for this book is to teach you about this remarkable cooking technique which will give you the confidence to tackle culinary challenges, big and small, and help you become the badass cook that you never knew you could be.

Sous vide (French for "under vacuum") refers to a cooking method in which food is sealed in plastic and cooked in a temperature-controlled water bath, but it isn't an esoteric tool relegated to the escapades of *Iron Chef* competitors, gearheads, and food nerds. It's a fail-safe cooking technique that results in amazing textures and flavors that anyone can use to make perfectly cooked dishes, regardless of skill level or training. What you'll soon discover

is that when you cook food at exactly the correct temperature, very little can go wrong. Imagine not having to worry about your turkey being dry on Thanksgiving. Imagine preparing salmon that emerges moist, jeweled toned, and delectable to even the pickiest of fish eaters. With sous vide, even fussy desserts like crème brûlée become easy and effortless to master. Simply put your ingredients into a bag, set the temperature, and then sit back (maybe even pour yourself a drink) and let it do its thing. No babysitting, no heartache, and the results will be amazing. Every time. You'll impress your friends and even yourself with how well you'll cook with sous vide.

A BRIEF HISTORY OF SOUS VIDE

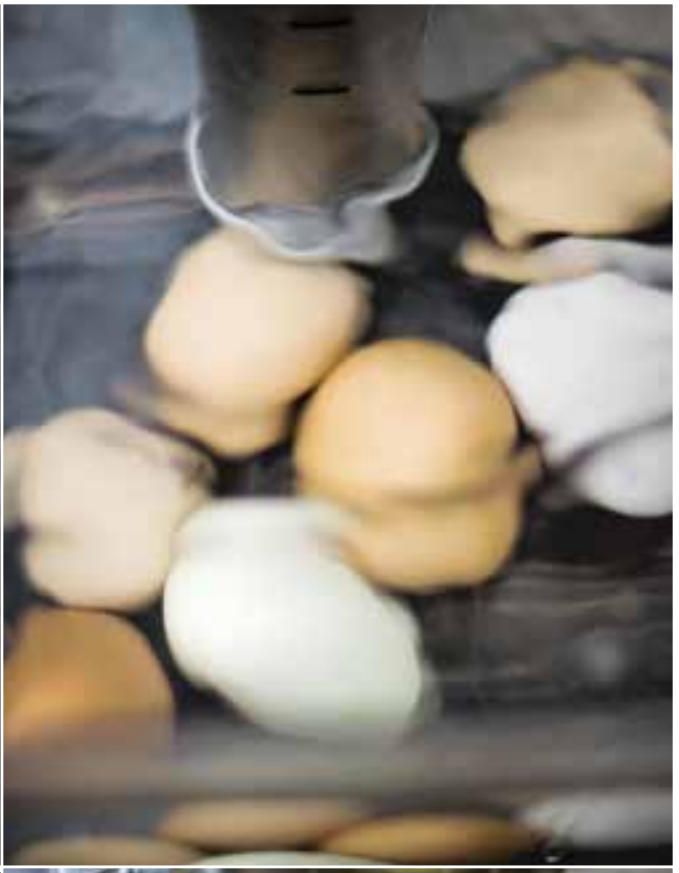
Anyone who frequents restaurants has probably eaten food that has been cooked sous vide. It's used everywhere from the world's top-rated restaurants to fast-food companies. The British Royal Navy deploys it to feed its troops on submarines twenty thousand leagues under the sea, and it's how airlines heat up your turkey tetrazzini in the friendly skies.

The magic behind sous vide is consistent heat. Humans have sought methods to moderate and control heat for millennia, whether it be by braising in clay pots, sealing with salt crusts, or burying in pits of smoldering ash. From roasting over a spit to home stoves and ovens with temperature dials, culinary innovations and advancements have been driven by the same burning desire: the quest to tame heat. Although you and I now take these time-honored cooking techniques for granted, Harold McGee, the acclaimed food scientist and author of the groundbreaking book *On Food and Cooking*, reminds us that throughout history, people have witnessed the invention of paradigm-breaking cooking tools that had to fight their way into acceptance in the kitchen.

In the twenty-first century, sous vide machines have ended that quest. Specifically, the thermal immersion circulator, the element responsible for heating, circulating, and maintaining a precise water temperature, provides a tool that can control temperature to a tenth of a degree, resulting in extraordinary flavors and textures not possible with traditional cooking methods. It was originally developed for use in laboratories, where precision heating was required for scientific study. In the 1960s, the technique was adapted by hospitals as a way to sterilize packaged foods for distribution and by large-scale commercial food ventures concerned with improving the efficiency, safety, and storage of their products. The crossover from industrial food service to fine dining didn't take place until 1974, when French biochemist George Pralus was enlisted by three-star Michelin chef Pierre Troisgois to develop a better technique for cooking foie gras at his eponymous restaurant in Roanne, France. Pralus discovered that sealing the fattened liver in a plastic pouch and poaching it at a precise temperature resulted in the least loss of precious fat, so that it retained its vaunted flavor and texture. That discovery is widely considered the birth of the modern sous vide movement.

Around the same time, another French scientist, Dr. Bruno Goussault, was making similar discoveries working with fast-food companies and hospitals to develop sous vide techniques utilizing pasteurization and improving shelf life. In 1986, Goussault went one step further by teaming up with acclaimed French chef Joël Robuchon to create the first all sous vide dining program for SNCF, the French state-owned railway. Goussault went on to bring the technology to other large-scale commercial food-service organizations.


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In the United States, vacuum packing, more commonly known as Cryovacking, after the American company Cryovac that manufactured the plastic, has been used since the 1960s to increase food efficiency, safety, and shelf life. But the dining public was initially skeptical of these sterile boil-in-a-bag endeavors that were more closely associated with industrial food-service operations, such as hospitals, airlines, and fast-food conglomerates. It wasn't until Pralus's discovery and Goussault's collaborations with the world's most highly respected chefs throughout Europe and in the United States that sous vide gained acceptance in the professional kitchens. But once it did, it spread rapidly. Since the early 2000s, sous vide has fundamentally reshaped the way that professional restaurants plan, execute, and hold their dishes. Nearly every Michelin-starred restaurant in the world employs some sous vide technique in its kitchen, and a great number of casual restaurants are following suit. Without abandoning their craft, more and more professional chefs are relying on precision heat control and applying the proper combination of temperature and time to turn out optimally prepared meals consistently.

Despite these breakthroughs, temperature-controlled cooking remained the exclusive domain of professional chefs. It wasn't until the past five or six years that sous vide hit its tipping point. The introduction of more affordable and portable immersion circulators such as the Nomiku, which don't require elaborate technical training or a deep-pocket budget, lowered the bar of entry and propelled a sous vide revolution among food bloggers and amateur chefs. This miraculous cooking method is now being used to splendid effect everywhere from Michelin-starred restaurants to Main Street haunts to the kitchens of a new generation of home cooks who were weaned on technology.

HOW TO COOK SOUS VIDE

When it comes to cooking sous vide yourself, you can forget the fancy French name, the history lesson, and the complex underlying science. From a cook's perspective, it couldn't be easier. Here's how it works: An immersion circulator device clamps onto the side of a stockpot and heats and circulates the water to reach and maintain a precise temperature. To operate it, simply fill the pot with water, set the circulator to the desired temperature, and let the water heat up. All the cook needs to do is seal the ingredients in an airtight food-safe plastic bag, drop the sealed ingredients into the bath when it reaches the target temperature, and then wait for the length of time specified in the recipe for the food to cook to perfection. Mind-blowing, right? If you can turn on a faucet and follow simple directions, you can reap the benefits of sous vide.

Take Cover

Slow, long cooking is a hallmark of the sous vide technique. For recipes that require cooking (or holding) the food for several hours in the bath, it's critical that the food remain fully submerged for the duration of the cooking time (see page 13 further explanation). For that reason, if your sous vide unit does not come with a lid, I recommend covering the water bath with plastic wrap or aluminum foil to minimize evaporation, thus preventing the water level from falling too low. It's a good idea to check the water bath every few hours. If the water level has fallen below the machine's minimum, add more water. Although the additional water will briefly lower the overall temperature, that brief fluctuation will have a negligible impact. If you notice at any point that the bag isn't fully submerged, reseal the bag to remove any air, adding weights to the bag if necessary.

The Flavorful Finish

Although sous vide cooking produces amazing results (namely, incomparable juiciness and otherworldly textures), there are a few things that it just can't do. Because the boiling point is never reached, pasta and grains are a no-go, as is baking. Sorry, there's no such thing as sous vide bread. Low-temperature cooking also means a crust or a sear won't form. In other words, your meat won't come out of the bag photo ready. Why, you ask?

The boiled-down explanation (puns always intended) is that the chemistry behind browning meat, the Maillard reaction, happens at temperatures above boiling. Not to be confused with caramelization, which is the browning of sugar, the Maillard reaction involves proteins and carbohydrates. Pronounced "my-YARD" (as in, my browning reaction brings all the boys to Maillard), it's named for Louis-Camille Maillard, the French chemist who first described the reaction. The science involved is complicated, but its interest to you as a cook is simple: it's responsible for creating the delicious, complex flavors we love in everything from meat charred on the grill to toasted bread. So, to get that much lusted-after crust, which adds both a boost of flavor and textural contrast, you'll need to sear it after cooking. That means you're going to have pull out at least one pot or pan. You'll see many different techniques in the following recipes—grilling, frying, pan roasting—with the same goal in mind: golden brown deliciousness.

You can build flavor in other ways, as well. The most straightforward method is to cook the food in question (let's say a steak) unadorned in the bag, remove it, and then season it before searing. The second way is to build flavor proactively by adding aromatics, in the form of a dry rub or marinade, directly to the bag to season the food while it cooks. In some cases, as with Oil-Poached Trout (page 63), this means your food is ready to eat right out of the bag, with the liquid in the bag becoming a sauce to pour on top. Other times, as in the case of General Tso's Chicken (page 89), the meat is seared in a skillet to get a satisfying crust, and then the cooking marinade is reduced for a tasty glaze. Either way, the results are sensational.

Cooking by the Numbers

One of the unique things about sous vide cooking compared with such conventional techniques as grilling, sautéing, and roasting is that you can't rely on the sensory cues of sight, touch, and smell that cooks normally use to determine when food is done. For that, you'll need to depend on a guide that calculates the proper combination of time and temperature. Because of this, it's important not to lower your bagged food into the water bath until it has reached the proper temperature. Just as you need to preheat your oven for good baking results, it's critical for your water bath to be at the correct temperature when the food goes in. Obviously, the amount of time it takes to heat the water bath depends on the size of the water vessel and the desired temperature. To speed up the process, start with hot tap water. (When you cook ingredients at different temperatures end to end, you will start with the higher temperature and drop in a handful of ice cubes to cool down the water quickly.)

For an avid cook, this absence of the typical cues takes some initial adjustment. But once you give yourself over to the rules and trust in the accuracy of your machine, you will be rewarded with the same (most often vastly improved) results with a fraction of the effort.

Celsius vs. Fahrenheit

You'll see that in this book that I've used Celsius as the standard temperature for the water bath. Aside from the fact that sous vide originated in Europe, the rationale behind this is that it allows me to avoid messy decimals. The nice integer for a slow-poached egg at 63°C, for instance, becomes the ungainly 145.4°F. Though it might be tempting to round that number down to nearest degree, those small differences can have a big impact when cooking sous vide. If Fahrenheit is your default mode of thought, fret not; all the sous vide machines on the market will allow you to easily toggle between Celsius and Fahrenheit. In the instances where I call for conventional cooking methods such as frying or baking, I've called for Fahrenheit, since that's the only option for most American appliances.

Cooking Advantages: What's in It for the Home Cook?

Like slow cookers, immersion circulators offer a hands-off approach. The radical improvement of sous vide is in precise temperature control. This puts you in charge of both texture and doneness. The results—succulent meats, silken fish, toothsome vegetables cooked in their own juices, custardy eggs—will come as a revelation. A side benefit of sealing food in a bag is lack of evaporation, which means that there's also no loss of flavor or aroma. Sous vide ensures that your food cooks to the perfect doneness. To illustrate this, let's compare it to conventional methods. Take a medium rare rib-eye steak as an example. When cooked over the high heat of a grill, the proteins in the exterior of the meat will firm up and brown almost immediately. At this point, the outside is cooked, but the inside is still raw. To bring the center to the desired medium rare, or 55°C, you need to keep cooking it. This means that the outer parts of the meat reach well done before the heat penetrates through, causing a band of overcooked gray meat to creep in as you approach your sought-after internal temperature. But when you cook a steak in a water bath set at 55°C, no part of the steak ever gets hotter than medium rare. In other words, it's impossible to overcook it. After an hour, the steak will be a lovely rosy medium rare from edge to center and will stay that way for hours. Because carryover cooking doesn't apply to sous vide, resting your meat before cutting into it becomes much less vital. I've indicated in the recipes when and if you need to rest the meat. If you don't see any note telling you otherwise, you are free to slice right in.

The accuracy of immersion circulators also lets you cook safely at very low temperatures that allow results that would otherwise be impossible. One such sous vide marvel is the slow breaking down of the connective tissue in tough cuts over a period of many hours, resulting in lusciously tender meats that are still medium rare from edge to edge. The ultimate example of this is sous vide short ribs (page 163).

But the appeal of sous vide isn't just the ability to produce flawless, restaurant-quality meals at home. It also gives the home cook peace of mind. With immersion circulators, you'll never go wrong because you apply exact science to the cooking process. Traditional cooking techniques over high heat depend on the cook to determine the correct temperature and length of time required to cook food properly. Sous vide removes the guesswork. By setting the temperature of the water bath to the desired internal temperature of the food once it is cooked, it's impossible to overcook the food, even if you forget about it. This ability to extend the cooking time for most foods without any negative impact is a godsend for people with busy and often unpredictable schedules. It's also a game changer for entertaining. Read more about that and about other meal planning strategies on page 15.

THE PERFECT SOUS VIDE STEAK

I consider steak the gold standard of sous vide cooking because it ensures reliable, exact cooking for a cut of meat where doneness counts for everything. This amount of control not only means that I can make *my* perfect steak every time, but that you can customize *your* perfect steak every time, too. I consider 55°C (131°F) the ideal temperature for medium rare when cooking rib eye and other tender steak cuts (for example, strip, top sirloin, tenderloin, and porterhouse). That said, experiment with temperature and let your own taste be your guide. You'll find that even a few degrees up or down can make a dramatic difference. If you or your guests prefer your meat more done, try cooking it at 60°F (140°F) for medium and 65°C (149°F) for medium well. The results will still be far juicier than conventionally cooked steaks.

SERVES 4 as a main course | **SOUS VIDE COOKING TIME:** 1 hour (or up to 5 hours) | **ACTIVE PREP TIME:** 10 minutes, plus 12 minutes to rest

2 (1-inch-thick) boneless rib-eye steaks (about 1 pound each), preferably with fat cap intact

Salt and freshly ground black pepper

1 tablespoon canola or other mild vegetable oil

2 tablespoons unsalted butter

4 to 6 thyme sprigs

1 clove garlic, lightly crushed

DO-AHEAD STRATEGY

If you intend to chill and reheat the steak, I recommend salting the meat after it comes out of the bag (see page 117 for an explanation). The cooked steak can be chilled in the bag in an ice water bath (see page 14) for 20 minutes and then refrigerated for up to 1 week. Reheat in a 55°C (131°F) water bath for 20 minutes and then proceed to the searing step. You can also reheat the fridge-temperature steak directly in the sauté pan or skillet by adding an additional 5 minutes while basting and turning the meat.

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Preheat your sous vide water bath to 55°C (131°F).

Season the steaks with salt and pepper and then place in a gallon-size freezer-safe ziplock bag and seal using the water displacement method (see page 12).

When the water reaches the target temperature, lower the bagged steaks into the water bath (making sure the bag is fully submerged) and cook for 1 hour.

When the steaks are ready, remove the bag from the water bath and let them rest for 10 minutes. Transfer the steaks from the bag to a platter or tray and pat the meat thoroughly dry with paper towels.

Heat a large, heavy sauté pan or cast-iron skillet over medium-high heat. Once the pan is hot, add the oil and swirl to coat the bottom. Let the oil heat until it shimmers and sends off wisps of smoke, 30 to 60 seconds. Place the meat in the pan and sear until the underside is browned, 30 to 60 seconds. Using tongs, flip the steaks over and brown the second side, 30 to 60 seconds longer. If the steaks have their fat caps, use tongs to hold both steaks upright on their sides, fat pressed against the pan, and render until the fat is crisp and browned, 1 to 2 minutes.

When the steaks are browned on both sides, or after the fat caps are crisped, add the butter, thyme, and garlic (in that order) off to the side of the pan. The butter will sizzle and brown immediately and the thyme will crackle and pop. Once the butter has turned completely brown and has stopped sizzling (meaning all of the water has cooked out), baste the meat: tilt the pan to accumulate the fat on one side, then, using a metal spoon, scoop up the brown butter and distribute it evenly over the meat. As you baste, be sure to flip the meat to brown both sides again as above until the entire surface is a deep, almost mahogany brown, about 30 seconds per side. Depending on the strength of the burner, you may need to flip the meat more than once; just make sure it doesn't rest on any one side longer than 1 minute or it will begin to overcook.

Transfer the meat to a platter or tray and wait for at least 2 minutes before slicing to allow the juices to redistribute after the high-heat searing. Enjoy your steak perfection.

PRO TIP

The technique of basting the steak with butter while in the pan is an excellent method any time you want to achieve a beautifully uniform sear on the stove top. I use it again in Beef Tenderloin in Red Wine Sauce (page 155).

