

**Variations:** You can use this recipe for rib steaks or for more tender cuts, such as tenderloin. For tenderloins, cook for less than 1 hour. For tougher cuts, such as skirt steak, either increase the cooking temperature to 135°F, or cook the meat for at least 6 hours to break down the connective tissue.

Courtesy of PolyScience

## Potlatch-Seasoned Salmon

*Fish is an ideal candidate for cooking sous vide because the technique retains the delicate flesh and cooks it to a perfect doneness.*

Set the temperature on a sous vide immersion circulator to 140°F.

Remove the salmon from the refrigerator, rub with 1 Tbs. of the olive oil and sprinkle on both sides with the potlatch seasoning.

Place the salmon in a bag and vacuum seal. Make sure the fillet lies flat.

Drop the bag into the 140°F water bath, making sure the food is completely submerged. If necessary, place a small weight on the bag. After 8 minutes, remove the bag from the water bath and feel the fish for doneness. If it is not done, return the bag to the water bath. Check every 2 minutes until the fish is done.

Remove bag from the water bath. Remove the fish from the bag. In a nonstick fish skillet or large nonstick fry pan over medium heat, warm the remaining 1 Tbs. olive oil. Brown the salmon on both sides. Serve immediately. Serves 4.

Adapted from a recipe by Williams-Sonoma Culinary Experts

## Crème Anglaise

Set the temperature on a sous vide immersion circulator to 179.6°F. Make sure your cooking tank has approximately 3-gallon capacity and is covered.

In a blender, combine the egg yolks, milk, cream, sugar, vanilla bean seeds and salt (do not add the vanilla bean pod). Blend on high speed for 15 to 30 seconds.

Pour the mixture into a bag, add the vanilla bean pod and vacuum seal, removing as much air as possible.

Drop the bag into the 179.6°F water bath and cook for 15 to 20 minutes. Cooking for 15 minutes will yield a thin crème anglaise that just coats a spoon; 20 minutes will yield a thicker crème anglaise. Do not cook longer than 25 minutes.

Remove the bag from the water bath. Wrap the bag in a kitchen towel and massage it for 2 to 3 minutes. This helps to prevent lumps. Place the bag in an ice bath to chill. (For best results, chill overnight.) Serves 2.

Courtesy of PolyScience

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## Frequently Asked Questions

### Is cooking sous vide safe?

As with any kind of cooking technique, food safety guidelines must be followed. For cooking sous vide, it is imperative that the food be chilled or cold before vacuum sealing and being placed in the set-temperature water bath. Follow these basic food safety steps:

- Chill the food, or sear the food and chill it immediately and thoroughly before vacuum sealing. Never seal warm or room-temperature food.

- Once the food is sealed, either cook it immediately or store it at a temperature of 38°F or below.

- After cooking the food at the desired temperature and time, remove it from the bag and serve it immediately (some recipes call for searing or browning the food to create a pleasing exterior surface).

- If not serving the sealed food immediately, keep it in the bag and chill it in an ice bath, then refrigerate or freeze.

- An ice bath should always be at least 50% ice—the more ice, the better. While the food is in the ice bath, move the bag around every so often or agitate the ice bath to prevent any areas of warm water from forming around the bag.

### What are the basic steps of sous vide cooking?

- Set up sous vide immersion circulator with water bath and heat to desired temperature.

- Vacuum seal chilled and seasoned food.

- Cook food for the required time.

- Sear food (if required).

- Serve food, or chill rapidly in ice bath or freezer if storing.

### Ingredients for Crème Anglaise

5 egg yolks

1 cup milk

1 cup heavy cream

$\frac{3}{8}$  cup sugar

1 vanilla bean, split in half and seeds removed, pods and seeds reserved

Pinch of salt

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# Technique Class: Cooking Sous Vide

*“The reason I’m so excited about sous vide is that it results in flavors and textures and entire preparations that simply aren’t possible by any other means.”*

—Thomas Keller, Adapted from *Sous Vide: A Guide to Low-Temperature Cooking*

## The Basics of Sous Vide Cooking

While you’ll seldom see the words “sous vide” on restaurant menus, this cooking technique—which literally means “under vacuum”—was originally utilized in the early 1970s to minimize product loss when cooking foie gras. Today chefs around the world embrace sous vide for preparing a wide array of dishes. With this technique, food is vacuum-sealed in a pouch and then slowly cooked at gentle temperatures. Foods become tender without losing their color, nutrients and texture.

Foods are heated to the right temperature for the proper length of time. The temperature depends on the kind of food (meat, fish, vegetables) and on personal taste (rare, medium). With all cooking techniques, including the microwave and sous vide, heat penetrates the outside surface of the food and eventually reaches the inner part, and then heats the center to the proper temperature.

For example, rare beef should be cooked to an internal temperature of 125°F. If you roast it in an oven at 400°F, by the time the center of the meat reaches 125°F, the outside is overdone because it has been heated to 400°F for a long time. Much of the beef, except for the center, is well done and gray.

On the other hand, if you “roast” the beef at 125°F—which nobody would do—none of it would be overdone, but it would take so long for the heat to penetrate and raise the temperature of the center to 125°F that the entire piece of meat would dry out; or if you stopped roasting it too soon to keep the meat from drying out, the center would still be raw.

With sous vide, you cook food at the temperature you want for the whole piece: no part is overdone or underdone. By sealing the food in a vacuumed bag, it does not dry out, lose nutrients or flavor during the long time needed to get the entire piece of food—outside and inside—to the proper temperature and hence, to the proper doneness.

### Precise Temperature Control

From a purely functional standpoint, cooking is the use of heat to induce chemical reactions, with different effects taking place at different temperatures. For example, the different proteins in the albumen of eggs coagulate at specific temperatures, and just a few degrees difference in cooking temperature will greatly affect just

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## Frequently Asked Questions (cont.)

### What kinds of foods are best for sous vide cooking?

Any food that benefits from precise, low-temperature cooking is suitable:

- Prime cuts of meat (e.g., beef tenderloin).
- Secondary cuts of meat (e.g., brisket).
- Delicate shellfish (e.g., lobster).
- Fish fillets (e.g., salmon).
- Root and bulb vegetables, artichokes and squash.
- Eggs.
- Cream bases like crême anglaise.
- Hollandaise sauce.

### What equipment is needed for sous vide cooking?

- Vacuum sealer, chamber vacuum sealer (preferred).
- Sous vide immersion circulator.
- Food-grade plastic bags (approved for cooking).
- Stockpot or other container.

### What temperature is used for sous vide cooking?

Just below simmering water. The highest temperature for vegetables is 185°F. Proteins are typically cooked in a range from 138°F to 160°F.

Courtesy of PolyScience

how much the egg white solidifies. The texture of the egg yolk also changes as its temperature rises.

Temperature affects meat in a similar manner. Cuts with high collagen content, such as chuck and brisket, should be cooked longer and at higher temperatures to adequately break down this tough connective tissue. Cuts with little connective tissue, such as prime rib, can become tough if cooked to those same temperatures. Just a few degrees can make a difference in an expensive cut of meat, turning it from tender and moist to tough and stringy. This is another benefit of sous vide cooking, as higher temperatures are not required.

The art of sous vide cooking is in determining the perfect core temperature the food needs to reach in order to achieve the desired taste and texture. For a dish that features an egg with a creamy custard-like texture, one chef might cook that egg to a core temperature of 143°F, while another may prefer 146°F. While this temperature difference might seem insignificant, the finished eggs will be drastically different from each other, making each chef’s dish unique.

The importance of precise temperature control underscores why the PolyScience Thermal Circulator is critical to sous vide cooking. Unlike slow cookers or simmering pans of water, the thermal circulator offers extremely precise temperature control along with “set it and forget it” convenience. The machine can be set to cook food to an extremely precise core temperature—within a fraction of a degree—with just a single adjustment. You simply set it for the desired temperature, add the food and walk away. Maintaining a slow cooker or pan of simmering water at just the right temperature is practically impossible, and repeatable results cannot be achieved consistently. Also, because these devices don’t circulate the cooking liquid, they can develop hot and cool zones that adversely affect the cooking process. This occurs because heat is transferred 100 times faster in water than in air. For this reason, you can reach into an oven and take out rolls that are at 250°F, but you can’t reach your hand into boiling water, even though it is at the same temperature.

### Cooking Time

Cooking times with the sous vide technique are affected by several factors, including the initial temperature of the food, its mass and heat transfer characteristics. The low temperatures for long periods of time are what make the tantalizing results of sous vide possible. As a result, it will take some testing and experience to determine the proper amount of time needed for a dish to reach the desired doneness.

In general, cooking time is affected by three factors: the core temperature you wish to cook the dish to; the heat transfer characteristics of the food; and the amount of food that will be cooked at one time. Also, the greater the cooking liquid to food ratio, the faster each portion of food will reach the proper core temperature. PolyScience recommends that when cooking sous vide, the cooking pouches be completely covered with liquid; also, there should be sufficient room for the pouches and cooking liquid to circulate freely. Another important advantage of slow, low-temperature sous vide cooking: it becomes much harder to overcook food by leaving it in longer than necessary. Once a dish reaches the desired temperature, it will take a lot more time to keep cooking the food; in other words, it can be kept at

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that temperature—moist, delicious and ready to serve—for a longer period without shrinking, drying out or becoming tough. This is particularly advantageous when cooking expensive cuts of meat, such as Kobe Wagyu beef.

### Enhancing Presentation

To complement and enhance the melt-in-your-mouth tenderness of sous vide meat dishes, many chefs finish the food by briefly grilling or searing it to create the familiar aromas and flavors that come only with high-heat cooking. The interior of the food will remain exceptionally tender and moist, and there will be very little, if any, of the shrinkage that occurs with traditionally grilled and roasted meats.

## Steps for Cooking Sous Vide

The sous vide cooking process is quite simple:

1. Set the Thermal Circulator or Thermal Bath to the desired cooking temperature and heat the cooking liquid.
2. Vacuum seal the food.
3. Place the vacuum-sealed food in the heated cooking liquid; the Thermal Circulator or Thermal Bath will apply additional heat as needed to maintain the cooking liquid at the desired temperature. While you can’t inadvertently overcook a dish with the sous vide method, you can undercook it if you remove it from the heated cooking liquid before it reaches the desired core temperature.

**Disclaimer:** The information presented above is for informational purposes only. As with any cooking method, proper food safety procedures should be followed.

Courtesy of PolyScience

## Seared Strip Steaks

Set the temperature on a sous vide immersion circulator to 131°F for medium-rare.

Generously season the steaks with salt and pepper. In a fry pan over high heat, sear the steaks for 45 seconds per side. This initial sear is not intended to cook the meat; it kills bacteria on the outside of the steaks, begins flavor development, and lays the foundation for a good crust in the second sear.

Place the steaks and butter in a bag and vacuum seal. If you are using a vacuum machine, chill the steaks, add to the bags with the cold butter and vacuum to 99% vacuum (use slightly more vacuum for bone-in steaks because bones have trapped air in them).

Drop the bag into the 131°F water bath, making sure the food is completely submerged. A 1-inch-thick strip steak will be perfectly done in 45 minutes.

Remove the bag from the water bath. Remove the meat from the bag and pat dry. In a fry pan over high heat on the stovetop, sear the steaks for 45 seconds to 1½ minutes per side. Slice and serve. Serves 2.

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### Ingredients for Seared Strip Steaks

2 strip steaks, each 1 inch thick

Salt and freshly ground pepper, to taste

3 Tbs. unsalted butter