

Use Thickening Agents for Soups and Sauces

THICKENING AGENTS give body to soups and sauces. Aside from clear broth soups and simple pan drippings, such as an au jus for roast beef, most soups and sauces are thickened to different degrees. There are a number of ways to thicken soups and sauces, all with somewhat different results. Knowing the outcome of each technique allows the chef to choose the appropriate method for the dish.



Objective:



Explain how each thickening agent is used in soups and sauces.

Key Terms:



amylase

amylopectin

beurre manié

emulsion

gelatinization

homogenous

instant starch

liaison

opaque

purée

reduction

roux

slurry

starch

translucent

whole butter

Common Thickeners in Soups and Sauces

Soups and sauces can be thickened in different ways. Many soups and sauces use the same types of thickeners, but some thickeners are more specific to soups or sauces.

STARCH

When a sauce or soup is not thickened by reduction, then a starch mixed with fat (hot or cold) or a cold liquid is often used to thicken the mixture. All natural starches have two basic

starch types: **amylase** (a long straight-chained starch) and **amylopectin** (a short-branched starch).

PRINCIPLES OF STARCH COOKERY

Starch is a bonded carbohydrate molecule found naturally in plants whose molecules are tightly packed together in small granules. The principles of starch cookery require a chef to physically soften and separate the starch molecules in cold water before they are heated. Softening the starch in cold water ensures that when the soup or sauce is heated, the mixture will thicken properly. In a hot liquid, softened starch molecules absorb the liquid, swell up, and pop out of their granular shells. As the starch granules pop, starch rushes into the hot liquid and thickening occurs—called **gelatinization**.

REDUCTION

Reduction is the thickening of a soup or sauce by evaporation of a liquid. It is the simplest method of thickening a soup or a sauce. It requires no addition of starch, only a longer and usually a slower cooking of the product that evaporates liquid (stock or broth), leaving the soup or sauce thicker by default. Reduction adds no calories or fat, and a reduction concentrates flavors. The right time to season a reduced sauce is following the reduction because the process of reduction may concentrate salt and other spices beyond what is standard.

ROUX

Roux (pronounced roo) is a mixture of equal weights (parts) of flour and fat (usually clarified butter) cooked over medium heat and stirred constantly. Cooking allows the starch in flour to absorb more liquid when it is added to a soup or sauce. A roux is the most common thickener for sauces and soups and comes in three colors and strengths: white, blond, and brown. Brown roux is cooked longer to brown the flour and butter to deepen the flavor. Brown roux is one of the flavor characteristics of Cajun and Creole cooking (e.g., gumbo). A roux is the one thickener all chefs must master.



FIGURE 1. Roux thickened soups and sauces have an opaque look and a heavy, somewhat creamy consistency, such as in the New England clam chowder in this picture.

BEURRE MANIÉ

Beurre manié (pronounced burr-manyay) is a liaison mixture of equal weights of flour and butter kneaded together but not cooked. The raw paste is used most successfully at the end of a sauce cooking process.

SLURRY

A **slurry** is a thin paste mixture of water (or any liquid) and a powdered starch softened in cold water and then added to hot liquids to thicken them. It is necessary to mix the starch with a cold liquid until fully dissolved and softened before it is added to hot liquid. This process avoids the lumps. Unlike roux, a slurry mixture is not precooked before it is used.



FIGURE 2. Note how shiny and translucent the blueberry glaze looks on this cheesecake.

PURÉE

A **purée** (pronounced pure-AY) is the French term for mashed cooked vegetables, fruits, rice, etc. A purée requires the use of a blender or food processor to pulverize the fully cooked solid ingredient into a homogenous mixture. **Homogenous** is a product that is completely uniform in nature, so the top, the middle, and the bottom have an identical consistency throughout—and that includes no lumps. Puréeing a liquid with fully cooked starchy ingredients results in a smooth thickened liquid with no solid pieces or lumps. This technique is commonly used for soups (e.g., cream of potato or split pea). Puréed soups or sauces are heavy and opaque and often separate if roux or slurry is not added.



FIGURE 3. Notice how smooth, creamy, and thick this cream of potato soup looks. It was thickened with puréed potatoes cooked in broth.

LIAISON

Eggs are a unique food that begin as a liquid and solidify when exposed to heat. A **liaison** (pronounced lee-ay-zohn), the French term for all types of thickening, is a mixture of cream and beaten egg yolks added at the last minute to sauces and soups. As the eggs cook, the sauce slowly thickens. The danger is cooking the eggs too fast or too hot. If either occurs, the egg protein will fully solidify or coagulate in the liquid, leaving a “globby” chunky mess known as a “broken” sauce. Cooling the sauce immediately after it reaches the proper temperature (about 180°F) stops the cooking process and prevents the sauce from breaking. When correctly prepared, the result is a rich creamy smooth sauce (e.g., the custard for rice pudding or the base for ice cream).

Emulsion

Sometimes the liaison process is dependent on the addition of energy to make the sauce come together, specifically energy in the form of fast mixing. This process is the making of an emulsion. An **emulsion** is a homogenous mixture of two or more generally unmixable ingredients—oil and water—in which globules of the oil or fat are held in suspension by egg yolks. The classic sauce hollandaise requires the chef to rapidly mix eggs and butter together over heat as the egg cooks and thickens the sauce. Along with the mechanical mixing and whipping that make an emulsion possible, egg yolks contain a natural ingredient that makes the emulsion process possible—lecithin. As with custards, cooked egg emulsion sauces can “break” if the butter is added too fast or if the egg becomes too hot.



FIGURE 4. A classic hollandaise should be thick, smooth, and golden.

OTHER THICKENING AGENTS

Butter is an important ingredient in a number of thickeners, and butter itself can be used as a thickening agent, although it is a weak one. The addition of **whole butter** bits—regular unsalted butter and not clarified—to a sauce at the end of the cooking process gently thickens it and makes it shine. The addition of whole butter bits usually occurs off the heat. Sauces thickened in the whole butter method must be served immediately.

INCORPORATING THICKENING AGENTS

The incorporation of various thickening agents requires different techniques for successful results.

Roux

Roux is crumbly and it is added while mixing the liquid with a hand whisk to prevent lumping. As a rule, hot roux is added to a cool liquid, or cool roux is added to a hot liquid. Both techniques avoid lumps from forming in the final product. The full thickening of a liquid using a roux will not be realized until the mixture reaches a boil. The goal for a sauce thickened with a roux is to create a homogenous mixture with no lumps. Any liquid thickened with a roux will be **opaque** (no longer transparent or clear) and cloudy.

Beurre Manié

Little bits of beurre manié are added to a hot sauce to thicken it and to add some richness. Because it is raw, it requires longer cooking than a roux to fully thicken a sauce. It is best suited to thickening batches of those sauces known as small sauces: lyonnaise, béarnaise, and mornay are examples.

Slurry

A slurry is most commonly used to prepare sauces, but it is equally effective for soups. It must be thoroughly mixed, and the starch must be fully dissolved prior to its addition to a



FURTHER EXPLORATION...

ONLINE CONNECTION: Properties of Starches

A number of powdered starches are available for use in slurries, but they each perform differently. Cornstarch, tapioca, arrowroot, potato starch, and others will thicken liquid quite effectively and result in a smooth translucent gel or glaze. The differences are found in how much of each it takes to thicken the same amount of liquid equally. Eventually slurry-based sauces break down. Liquid starts to separate out—weep—but each starch breaks down under different circumstances and after varying lengths of time. So, which is which? Knowing allows you to choose the right starch for the right job!

Information about powdered starch strengths is readily available online, so do some research and find out which starch is the most stable. Which starch is ruined when a dairy product is introduced into the sauce? Which starch holds up best when kept hot for long periods of time? Which starch breaks down in the presence of an acid? How do instant starches hold up compared to raw cooked starches? How does flour compare as a starch; why isn't it used for slurries?

To find out more about the properties of powdered starches, visit the link below:

<http://sonic.net/~alden/ThickenStarch.html>

cooking sauce or soup. Arrowroot starch thickens very quickly and it is unnecessary to bring the mixture to a boil for it to work. Cornstarch, on the other hand, requires heating the mixture to a boil to fully thicken the mixture and to avoid any “starchy” taste or texture in the finished product. Regardless of which powdered starch is used, the results will be a liquid that is more translucent in appearance than a roux. A **translucent** product is a product in which the fluid is partially opaque, but light still passes through it. The result is a more “glaze-like” appearance.

Where a glaze-like sauce is desired but cooking is not possible or recommended, instant starch is now widely available. **Instant starch** is precooked starch that thickens cold liquids when whisked in briskly to the liquid; no heat is required. It is a glaze similar to a slurry mixture that is created when the cooked, dehydrated, and pulverized instant starch powder is added to a cold liquid. It is commonly used in instant puddings. Instant starch is used in Asian cuisine and to give food a shiny glaze.

Summary:



Many soups and almost all sauces are thickened in some manner. Reduction is the simplest way to thicken a soup or sauce and requires longer cooking to force evaporation of liquid, leaving the sauce or soup thicker. Roux is a cooked mixture of flour and fat and is used to thicken soups and sauces. A crumbly mixture, it is added to liquid and boiled until thick, resulting in a rich, heavy, and opaque liquid. Soups made with starchy vegetables can purée or blend the vegetables to thicken the soup since all starches naturally absorb liquid and make them thicker. Slurry is a mixture of powdered starch and liquid added raw (not heated) to a cooking liquid and heated until the mixture is thick, glossy, and translucent. Slurries are most commonly used for sauces and Asian cooking but can be used for soups, too.

Beurre manié is a raw mixture of butter and flour whisked into a sauce in small pieces at the end of the cooking process. It reacts like roux but takes longer to thicken the sauce because it is raw. Sauces can be thickened with eggs by using the warming technique called liaison before cooking. Other sauces can be lightly thickened off the heat source by the addition of whole butter bits at the end of cooking.

Checking Your Knowledge:



1. Why are powdered starches (e.g., cornstarch) mixed with a liquid before adding to a hot soup or sauce?
2. Use logic to explain why eggs (and liaisons) are not used to thicken soups.
3. What concerns should be considered when using reduction to thicken a sauce?
4. Describe what a sauce or soup cooked with a roux thickener looks like when it is fully thickened.

5. If you were making a fresh strawberry topping for cheesecake, which thickener would you choose? Why?

Expanding Your Knowledge:



Understanding the science and chemistry of starches and how they work as thickeners allows you to manipulate and master the technique. Some starches (e.g., corn-starch) look like powder, but what form would it have under a microscope? Is the starch molecule's shape relevant to how starch works with heat and moisture? What chemical reaction is taking place when starch, water, and heat come together?

Whether you use a slurry or a roux, the thickened liquid will become thicker as it cools off. Why does that happen? Does the cooled mixture return to the same thickness when it is reheated? Explain your answer.

Web Links:



Science of Starch for the Perfect Sauce

http://articles.sun-sentinel.com/2006-05-18/news/0605160149_1_starch-sauce-tablespoon

Thickening Agents for Sauces

<http://everything2.com/title/Thickening+Agents+For+Sauces>

Food Guide—Thickening Agents

<http://ezinearticles.com/?Food-Guide—Thickening-Agents&id=1537535>

In the Thick of It

<http://www.foodreference.com/html/art-thickening.html>