



Mysteries of the Kitchen Revealed

Why does cream whip? Cream has a higher fat content than milk. Whole milk contains about 3% to 4% fat by weight, while heavy cream has about 35% to 40% fat. Light cream contains about 20% fat. When you whip cream, the surface of the fat globules rupture, causing them to stick together. Whipping also traps air between fat molecules. The result is a delicate, but rigid network of fat globules and air. In milk, the fat globules are too few and far between to give the same result.

Why do yolks sometimes turn a greenish-gray when I boil eggs? The color is the result of ferrous sulfide, a harmless iron compound that forms when eggs are overcooked. During cooking, sulfur is released and joins with hydrogen molecules to form a gas. This gas lends a characteristic odor to cooked eggs. As the gas forms, it combines with iron on the surface of the yolk, resulting in a greenish-gray color. The reaction is particularly common in eggs that are less than fresh. To avoid the green color, cook for no more than 15 minutes, then immediately plunge into cold water to pull the gas away from the yolk.

Why do recipes that call for cooked fruit also call for a lot of sugar? No one likes mushy fruit and that's exactly what happens when most fruit is cooked. Loading the cooking liquid with sugar remedies the problem, because sugar strengthens the cell walls of fruit and helps to draw water back into the cells, thus restoring some of the fruit's natural firmness. You can cut back on the sugar in recipes, if you don't mind sacrificing a bit of texture.

Why do some foods turn brown when they are cut, while other foods do not? Some foods contain an enzyme called polyphenoloxidase. When plant cells are exposed to oxygen after being damaged, as they are when cut or bruised, polyphenoloxidase oxidizes naturally occurring

phenolic compounds in plant tissue. It is these oxidized compounds that give cut fruits and vegetables their characteristic brown or gray color. Foods like melons, oranges and tomatoes, which do not contain this browning enzyme, still turn brown due to oxidation, but it takes a lot longer. You can, of course, prevent browning by dipping cut surfaces in lemon or orange juice. The vitamin C in the juice acts as an antioxidant.

If there is no butter in buttermilk, why is it called buttermilk? Traditionally, buttermilk was the name for the liquid left over after churning cream into butter. Today little buttermilk actually comes from butter. Instead modern buttermilk is cultured from skim milk. Either way, it has a rich tangy flavor and is very low in fat, despite its name.

What makes some vegetables like cauliflower, broccoli and cabbage stink when you cook them? Broccoli, cauliflower and other members of the cabbage family contain sulfur compounds called mustard oils or isothiocyanates. When cooked, these and other compounds break down to form various odoriferous compounds like hydrogen sulfide (rotten egg smell), ammonia, mercaptan and methyl sulfide. They are not harmful, but the longer the vegetable cooks, the more molecules are released and the stronger the odor becomes. To reduce the odor, steam the vegetables only until tender-crisp, and try adding a few pieces of bread to the cooking water to absorb the odoriferous compounds.

Why are cooked cornstarch mixtures translucent, while wheat flour mixtures look milky? The key is gluten proteins. Wheat flour is made up of about 10% protein by weight, while cornstarch is practically pure starch with no protein. Gluten protein is not soluble in water and will not break down during cooking. Light cannot pass through the impenetrable gluten and the result is a milky appearance to sauces. Cornstarch, on the other hand, has no protein and light passes right through its starch-water mesh. Thus, cornstarch mixtures are translucent and glossy, while wheat flour mixtures are opaque.

Is it better to tear lettuce leaves or cut them? Most salad lovers will tell you that a torn leaf lasts longer, while a cut lettuce leaf turns brown faster. The rationale behind this is that, when torn, the leaf breaks along the natural boundaries between cells, whereas a knife cuts right through cells causing more damage and quicker browning. Despite this theory, however, there appears to be no real difference in browning between a cut leaf and a torn one. So, whether salad greens are cut or torn is a matter of personal preference.

What is the difference between cake flour and all-purpose flour? The amount of gluten. All-purpose flour produces more gluten because it has more protein than cake flour. You wouldn't want to substitute cake flour for all-purpose flour in breads, because gluten provides the structure necessary for it to rise. But in cakes, the weaker gluten structure of cake flour produces a highly desirable tender, crumbly texture. Still, all-purpose flour can be substituted for cake flour. Use one cup all-purpose flour minus two tablespoons for every cup of cake flour.

What makes brown sugar brown? Nowadays, brown sugar is actually nothing more than refined white sugar with molasses sprayed on it. The darker the sugar, the more molasses it contains. But not enough is added to provide significant amounts of any nutrients.

Why do onions make you cry? Watery, burning eyes result from a substance in onions called lachrymator, a derivative of the sulfur-containing

amino acid cysteine. It is released when the onion's tissue cells are disrupted by chopping or dicing. When lachrymator comes in contact with the fluid in the eye, irritating sulfuric acid is formed. Fortunately, the compounds are very unstable and decompose rapidly. To tame your tears, try freezing onions for 20 minutes before chopping.

What is cream of tartar used for? Cream of tartar is an acid you add to whipped egg whites in order to stabilize the foam. It makes the foam less prone to lumpiness, drainage and collapse. Only a very small amount is needed to maintain a delicate structure.

When I eat breakfast I am much hungrier at lunch time than if I skip breakfast. I'm trying to control my weight and want to know if there is any harm in avoiding breakfast altogether. If your objective is to control your weight, research suggests you're better off eating breakfast. Breakfast skippers almost always end up eating more calories during the day compared with this who regularly eat breakfast. In addition, those who skip breakfast may have slightly lower metabolic rates than breakfast eater. One study showed that breakfast skippers had metabolic rates 4 to 5% lower than normal. You may initially "feel" hungrier when you start eating breakfast because your body has not had time to get used to your new habit. Give your body several weeks to adjust.

Does white cheese have less fat than yellow cheese? Most white cheeses, including brick, Muenster, Swiss and jack, contain the same amount of fat (8 to 9 grams per ounce) as common yellow cheese. Some part-skim mozzarella or string cheeses may have a lower fat content. Color is not a reliable indicator of fat content. Read the Nutrition Facts label instead.

Now the media are saying low-fat milk is high in fat. Should I be giving my kids (ages 1½, 4 and 7) skim milk? The American Academy of Pediatrics recommends whole milk for children under 2 because fat is essential for proper brain and nervous system development in children that age. Your older children can drink skim or 1% milk. Very active children and adults may opt for milk with a higher fat content to meet their increased calorie needs.

A 1-cup serving of whole milk has 8 grams of fat, compared to 5 grams of fat in 2% milk, 3 grams of fat in 1% milk, and no fat in skim milk. Whatever type of milk you drink, they all have similar amounts of calcium and other important nutrients.

Do I need to take an antioxidant supplement?

Currently there are no published guidelines for antioxidant intake. The study of these food components is in its infancy. Some physicians that work in the field of heart disease and cancer prevention prescribe supplements for their patients, but not for the general public. The best way to have a diet high in antioxidants is to eat at least five servings of fruits and vegetables a day and plenty of whole grains.

How can I determine the calorie content of vodka, rum, or other alcohol?

A simple formula will help you figure the calories in distilled spirits: number of ounces x proof x .08 = calories. For example, a 1-ounce portion of 80-proof vodka has about 64 calories (1 x 8 x .08=64). The higher the proof, the more alcohol and calories a drink will contain. This formula does not apply to liqueurs or other spirits that have added sugars.

Do carbohydrates turn into fat? Eating too many calories, whether they are in the form of carbohydrate, protein or fat, will lead to weight gain. It's true that carbohydrate is used before fat or protein for energy, but if you eat more than your body needs, it will be stored as fat.

Why should you care about calories? Calories are a way to measure the energy supplied by foods. If you don't eat foods that provide you with enough calories, your body won't have enough energy to grow. If you take in more calories than your body needs, or if you aren't active enough to use up those calories, you will gain weight.

How does flour thicken a sauce? Flour is a starch. Starch occurs in granules. These granules are essentially insoluble in their natural state, and only begin to absorb water with the introduction of energy in the form of heat. As the water begins to seep into the granules, they swell and begin to bump into one another so that the mixture thickens. The solution reaches its thickest point just past the gelatinization stage, which occurs between 175° and 205°F. At this point, the granules begin to leak amylose and amylopectin starches into the liquid. These molecules, particularly the long amylose chains, form a web that traps the swollen granules, thickening the liquid further.

At a temperature somewhere near boiling, however, the granules have maximum size and burst open. This bursting has two consequences, it allows most of the starch molecules to escape, and it also forces the water that had been absorbed by the granule to escape back into the mixture. As a result, the mixture begins to thin out again.

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