

All About Alliums

Flavors, Health Benefits, and Cooking Techniques

CULINARY CONNECTION



Allium. Sound familiar? Unless you are fluent in Latin it probably won't, because *Allium* is the Latin word for garlic. In biology, Allium is the designation for a genus of plants that includes not just garlic, but onions, shallots, leeks, scallions, and chives as well.

It is difficult to imagine a list of plants more important to culinary arts. Their unique biochemistry gives them similar flavors, aromas, and health benefits. In this article we will look closer at a few species of Alliums, and how they respond to various cooking techniques. Understanding the nature of Alliums is essential for every chef's toolbox.

ONIONS

Allium Cepa

At their most basic, onions are divided into two categories: storage and sweet. Storage onions are the workhorses of the culinary world and are designated simply by their colors of red, yellow, and white. They are cheaper, have thicker paper skins that help them last for weeks in your dry storage, and pack a potent sulfurous punch that intensifies their flavor and aroma to tear-inducing levels.

Storage onions should be your go-to for *mirepoix* (soup veggies), slow cooking, and faking a nervous breakdown, Oscar

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acceptance speeches, and any other time you need to cry on command. Sweet onions include Vidalia, Spanish, Maui, Texas, and Walla Walla varieties. These onions are not necessarily sweet tasting because of their sugar content, but rather because they contain less of the harsh sulfurous bite of their working-class cousins, which allows the sweetness to come through.

Sweet onions can be quickly identified by their very thin paper skins and higher price tag. They have a much shorter shelf-life in your dry storage and are the best choice for raw applications and short-order cooking like grilling, deep frying, quiches, and tarts. (LaLiberte, 2021)

SHALLOTS

Allium Cepa Aggregatum

Shallots were classified as a separate Allium species from onions up until 2010 when the powers that be decided that they were actually still just onions and reclassified them as *A. cepa*. Because of their prominent place in so many world cuisines, I think they deserve their own little section. Shallots are similar in appearance and flavor to their larger red onion cousins with a lighter color, sometimes pink or purple or even gray.

They can still induce tears despite their tiny size (but far less than an onion), and have a much milder flavor. Shallots can be utilized in places where onions would be too overpowering like vinaigrettes, condiments, sauces (béarnaise comes to mind), and seafood.

LEEKS

Allium Ampeloprasum

Leeks are the mildest member of the Alliums, and sadly, they seem to get the least attention here in the United States. Mild enough to be called “*asperge du pauvre*” or “poor man’s asparagus” in France and eaten as a side dish, yet they’re still flavorful enough to deserve a place at your table. Most of us aren’t familiar with leeks beyond potato and leek soup, but they can do everything that onions and shallots can do.

The root tip and the dark green leaves aren’t great for eating, so cut them away until you have a white cylindrical section (although some chefs swear by the dark green leaves to add another dimension to their stockpot). Unlike the other Alliums that are enclosed in a papery outer covering, leeks are open to the world at their tops. This leads to the sandy soil finding its way in between the layers. Simply split them lengthwise and fan the layers under some running water to rinse clean. I love fried leeks as a garnish,

not leastways because you can cut them in perfectly straight lines, but they are delicious.

GARLIC

Allium Sativum

Truly deserving of its own article, if not an entire textbook, garlic gets the most attention of the Alliums. From the possible range of flavors to the incredible health benefits and medical potential, it is the most written about, the most studied, and possibly the most loved flavoring ingredient in cooking. The English word *Garlic* comes from the Anglo-Saxon *Garleac*; *Gar* meaning “spear” and *leac* for “leek.” Whether it was called the “spear-leek” for the spearhead-shaped cloves, or for the sharp flavor is unknown. Anthony Bourdain said it best, “Garlic is divine. Few food items can taste so many distinct ways, handled correctly. Misuse of garlic is a crime. Please, treat your garlic with respect. Too lazy to peel fresh? You don’t deserve to eat garlic.”

CHEMISTRY OF ALLIUMS

The edible bulbs of Alliums are where the plants store water, nutrients, and carbohydrates to utilize for growth and survival later. Alliums have evolved a unique defense mechanism. Whereas most essential oils in plants are always present, Alliums release the compound called *Allicin* only when damaged. Allicin is delicate due to its reactivity,



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and will not survive cooking, drying, or even exposure to the air for very long.

This reactivity is also what makes it so interesting chemically. Allicin is present in all Alliums, but the chemical reactions vary between the different species. When you chop an onion for example, damaged cells release *alliinase*, an enzyme that starts a chain reaction creating syn-propanethial-S-oxide. This aerosolizes and reacts with your eyes, making you cry. The fancy word is *Lachrymator* from the Latin word for tears.

The Allicin compound in garlic eliminates competition in the soil by inhibiting seed germination and plant growth in nearby organisms. This could one day yield a natural herbicide farmers could grow themselves. It is antibacterial, killing even antibiotic resistant strains, and pound for pound, may be as effective as modern antibiotics. Allicin also harms fungi, so I wouldn't recommend putting fresh minced garlic in with yeast if you want it to live. Onions, garlic, et al. are available without a prescription. (Jan Borlinghaus, 2014)

The sulfurous nature coupled with the complex carbohydrates in the Allium bulbs give them their unmistakable flavor profile and unique characteristics. Because these organo-sulfuric compounds are delicate, they respond to different levels of processing. You cannot get the health benefits of Allicin from garlic powder, nor will caramelized onions bring a tear to your eye. (University, 1990)

COOKING ALLIUMS

Because of their biological similarities, you can treat Alliums the same way in the kitchen and achieve similar outcomes. Alliums are most biologically active and have their most potent flavors when raw and freshly chopped. That means that the longer you cook Alliums, the milder and sweeter their flavor will be. When selecting them, avoid any with soft spots or green sprouts.



Alliums respond well to roasting and have a completely different flavor when roasted. To roast them, it is best to leave them whole, and in the case of garlic and shallots you can leave the papery layer on and just squeeze the roasted product out once it cools down. Roasting whole onions will take a very long time, so you might want to cut them in half or quarter them, while leeks and scallions will roast much quicker. Just be sure to follow basic roasting procedure, coat your Alliums in oil, add salt and pepper, use a higher temperature oven, and don't overdo it. Your nose will tell you—and the entire neighborhood—when they are getting close.

Grilling is another option to bring out that sweetness while adding a hint of char or smokiness. It is personal preference how far you want to take it. If you are looking for a slight sweet char without losing the crunchy texture, use a higher temperature. An old family trick is to put a few thick slices of onion on the grill at the start of your next barbecue, the aroma gets everybody's stomach growling before the grill is fully hot. A word of caution with garlic and a char grill. It will burn much more quickly than

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whatever it is flavoring, and burnt garlic is awful. This is one instance where dried or granulated garlic might be preferable.

Sautéing alliums allows you to tightly control their flavor profile by controlling exactly how long they are cooked and at what temperature, as well as when you add the other ingredients. In the case of onions, you can cook them low and slow until they caramelize, then build a French onion soup right

on top of them. You can add minced garlic to a hot sauté pan and then add other ingredients to get a milder garlic flavor, or you can add it at the end after everything is cooked for a stronger kick. Breading and frying onions, leeks, or shallots can make a fantastic garnish that adds flavor and aroma and can be prepped ahead of time and kept at room temperature for a few hours during service. Don't just pull this out for green bean casserole!

Raw Alliums shouldn't be overlooked. You can control their strength somewhat with some judicious knife skills. The larger the cut, the more overpowering that bite will be. Garlic can be chopped so finely that it disappears into a sauce or mayonnaise salad, and shaved onions will not have the oomph of thick sliced ones. Scallions can be slivered so finely that they add color and freshness without a ton of flavor, or chopped so they add crunch and kick.

The beauty of cooking with these wonderful Alliums is that you get to decide. The recipe calls for garlic, onions, leeks, or scallions? This is where you can put your spin on it and make it your own! As always, experiment, try different combinations, and love what you do. Use these cheap and universal ingredients to their fullest! Everyone will be glad you did, except maybe those pesky vampires. **E**

CE Questions: Culinary Connection



This Level II article provides basic to advanced resources. The desired outcome is to facilitate application of knowledge into practice by drawing connections among ideas and using information in new situations.

Reading *All About Alliums: Flavors, Health Benefits, and Cooking Techniques* and successfully completing these questions online has been approved for 1 hour of continuing education for CDM, CFPPs. CE credit is available ONLINE ONLY. To earn 1 GEN CE hour, access the online CE quiz in the ANFP Marketplace. Visit www.ANFPonline.org/market and select “**Edge CE Articles**” within the Publications Section. If you don't see your article title on the first page, then search the title, “*All About Alliums: Flavors, Health Benefits, and Cooking Techniques*.” Once on the article title page, purchase the article and complete the CE quiz.

- Allium* refers to:
 - A genus of plants containing garlic, onions, shallots, leeks, and scallions
 - The metal element that gives garlic and onions their unique flavor
 - The genus of plants that contains celery, carrots, and potatoes
- Onions are classified in two main categories:
 - Red and yellow
 - Storage and sweet
 - Crunchy and soft
- Leeks should be washed before prepping because:
 - All* produce should be washed before prepping
 - Sandy soil gets in between the layers
 - Both A and B
- Granulated garlic:
 - Lacks the chemical that provides all the health benefits
 - Has twice the health benefits of fresh garlic
 - Is not made from real garlic
- Alliums can be eaten raw, roasted, sautéed, or deep fried without changing their flavor.
 - True
 - False
- Onions make you cry because:
 - Onion enzymes can pass through your skin and quickly reach your eyes
 - They emit an aerosolized chemical when chopped
 - I'm not crying, you're crying
- You can control the intensity of raw Alliums to some degree by:
 - Using a wooden cutting board
 - Slicing them thinner and reducing the amount used
 - Both A and B