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INTRODUCTION • INTRODUCTION • F•STEP

CULINARY BOOTCAMP

WORKBOOK

Mastering the Principals of:

- ✓ Flavor
- ✓ Sauce
- ✓ Technique
- ✓ Execution
- ✓ Preparation

This is an introductory version of Chef Jacob's Culinary Bootcamp Workbook and F-STEP™ curriculum. You can download the complete curriculum here.

WHAT IS F-STEP?

The F-STEP curriculum is more than an acronym that stands for Flavor, Sauce, Technique, Execution and Preparation. F-STEP is a mindset, a creative process, and the best method for teaching someone how to cook and think like a chef, all rolled into one. The F-STEP curriculum is the information I wish was available when I first started learning how to cook; especially when I made my jump to the professional kitchen.

When learning how to cook, it's important to put flavor first. If a cook doesn't have a basic understanding of how to create, balance, and structure flavors, than technique is useless.

Once flavor is understood, the next logical progression is to teach sauce making, including the fundamentals of stocks and broths, without which, important techniques such as braising, poaching, stewing, and pan roasting + pan reduction could not be understood or mastered. Even in modern culinary schools today, sauce making is taught using 120 year old fundamentals, and is so redundant, students focus on memorizing individual sauces instead of seeing the big picture. In the F-STEP curriculum, sauce is nothing more than flavor structure plus technique, and every sauce you'd ever want to make falls into one of three technical categories; reduction, emulsion, or purée. Once the science behind these techniques is understood, flavor structure is simply painted over the top, allowing the chef to create any number of unique sauces.

Only after the basics of flavor structure and sauce making are understood, should the student then focus on the scientific principles that make up cooking technique. This is a culinary minefield of dogmatic ideas, a lot of which are unfortunately still perpetuated in culinary schools today. In the F-STEP curriculum, we explore the science behind cooking technique, and more importantly, how to choose and apply the appropriate cooking technique to the product at hand.

But technique will only take you so far. Remember the F-STEP formula from above; you can have the best ingredients available and understand how to apply appropriate technique, but if you can't execute, then your food will always be mediocre at best. Unfortunately, execution is commonly overlooked by cook books and professional culinary curriculums alike. That is why once you understand flavor structure, sauce making, and technique, the F-STEP curriculum teaches you how to execute those three components at the highest level, planning your success before you even step into the kitchen.

However, F-STEP isn't just a curriculum, it's also a creative process, a road map for creating and executing a dish. That's why preparation is left for last. In the "F-STEP Process," the first four steps, flavor, sauce, technique, and execution, are all planned out in advanced, using the F-STEP Worksheet or just envisioning each step before the

cooking process even begins. Only when you have your flavor structure in place, your sauce selected, the appropriate technique chosen, and execution planned to a "T," do you actually step into the kitchen and start cooking or "preparing" a menu or dish.

As the F-STEP process and mindset gets ingrained into you over the course of this curriculum, the principles discussed above will become second nature, ultimately unleashing your inner creativity, and helping you develop your unique culinary style.

(Flavor + Technique) X Execution: this is the F-STEP formula, and the process used to create any dish, whether good or bad. First, flavors are constructed by selecting a combination of ingredients. Next, the appropriate techniques are applied to these ingredients in an effort to elevate them to the next level.

But notice how the sum of flavor and technique is then multiplied by execution? This is because no matter how great your flavor structure and ingredients are, or how flawless the technique applied is, if the dish isn't executed properly, nothing else matters.

The F-STEP curriculum's purpose is to give cooks, both beginning and advanced, a step by step process for creating great food, ultimately releasing the culinary creativity of anyone who works their way through these pages.

This text is not meant to be an epic "end-all-be-all" of how to cook, but instead, was created to influence your mind set when approaching the cooking process. Whether you lack understanding of how to construct complex flavors, create complementary sauces, how to choose and utilize the appropriate cooking technique, or need a confidence boost in preparing and executing amazing meals, the F-STEP curriculum forces you to mentally evaluate your approach to cooking. This curriculum is in essence a step-by-step approach, giving you a formula to follow so you can replicate your successes (and learn from your mistakes) every time.

Like any other skill, cooking is learned; but because there is so much dogma and intuition surrounding the culinary arts, it's easy for people to become overwhelmed, thinking they lack the skill, intuition or creativity to become a great cook. In fact, becoming a great cook is a lifetime pursuit that takes patience and a lot of learned knowledge.

If you diligently work your way through the F-STEP curriculum, focusing on the overall process and mindset, you'll have an understanding in the culinary arts, and a strong foundation in fundamentals, few cooks truly posses.

F IS FOR FLAVOR

To become a great cook and best understand the F-STEP process, we need to start at the beginning, stripping away preconceived notions while taking nothing for granted. The first and most elemental step in the cooking process is deciding what to actually cook. While this may seem an excruciatingly obvious point, this simple question of "what will I cook" has many implications, most of which are commonly overlooked. Visualize for a moment the importance this decision carries. If you say to yourself "I'm going to cook chicken," then you are not only defining what you will be making, but what your primary flavor will be. With this decision comes many important questions.

First, is the ingredient in season? It may be the middle of fall and you find yourself craving a roasted asparagus salad, but does that mean you should serve it at an upcoming dinner party? Asparagus is a spring crop; if it's purchased and served outside of the spring season, it will be of inherent low quality, predisposing my cooking efforts to mediocre results before I even step into the kitchen.

For more information on how to find and select seasonal ingredients, please see our "Guide to Seasonal Produce" starting on page 34.

Second, can you get a high quality version of this ingredient at a cost you find reasonable? In the of case of poultry, pork, beef or fish, commonly found year round in your local supermarket, quality isn't guaranteed by availability. A common advantage that professional chef's have is the knowledge and connected resources to purchase the best ingredients possible. With the modern food system and a little knowledge on how to spot quality, this advantage can now be extended to the home cook who is able to acquire many high end ingredients once impossible to come by in a standard supermarket.

Finally, can you execute the primary ingredient you've chosen? Part of being a great chef is understanding your limitations. So much bad food isn't caused by poor technique or lackluster ingredients, it's caused by a flawed execution. This concept is so important that it gets its own section in the F-STEP formula and curriculum (see 'E is For Execution).

Most important of all, what you choose as your primary ingredient will influence every other decision you make throughout the cooking process, including applied techniques, execution, preparation, and of course, flavor structure. In the first step of the F-STEP process, your primary and secondary flavors are chosen and analyzed. The combinations of these flavors on your plate, or "Flavor Structure," is the core starting point of the F-STEP process.

UNDERSTANDING FLAVOR STRUCTURE

While conceptualizing or cooking a new dish, try to keep in mind how ingredients will balance, enhance, and interact with one-another, a concept commonly referred to as flavor structure. Once a primary ingredient is selected, secondary flavors and textures are chosen for their sole ability to elevate and enhance the dish's main component.

The golden rule of dish conceptualization is any ingredient which doesn't elevate the primary flavor (a.k.a., money ingredient) does not belong. Now the question is, how does one choose complementary flavors, especially when creating their own, unique dish?

In reality, building complex yet cohesive flavor structures while creating a new dish is an ongoing pursuit for any chef. There is no endpoint to the creation of flavors. This is part of the magic and mystery that drives chefs to continually create new dishes.

The first step all cooks must take when walking down the path of their own culinary creativity is understanding basic tastes, textures, and sensations. Like the notes available to a composer, the various nuanced components that make up flavor can be combined in infinite patterns, creating a symphony of blissful flavors, or something much less enjoyable.

WHAT IS FLAVOR?

Flavor, in its simplest sense, is the amalgamation of tastes, textures, sensations, and aromas, which as a whole, resonate on the palate as one cohesive experience. Think of flavor as a piece of music, with the basic building blocks like taste and texture being the notes and percussion instruments making flavor possible.

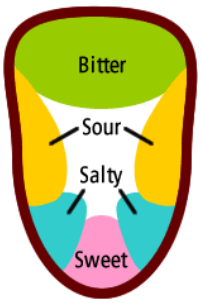
Taste is a primary element, such as salty or sweet, registered by taste receptors.

Flavor is the sum of taste receptors, aromas, and physical sensations.

For years, the concept of flavor, especially taste, has been oversimplified and misunderstood. As recently as two decades ago, grade school biology classes were still using out-dated diagrams splitting the tongue into 4 distinct zones, each responsible for tasting one of the four major flavors (salty, sweet, sour & bitter).

In fact, flavor is the complex sum of taste receptors, volatile aroma molecules, and tactile sensations. The human tongue is covered with thousands of small bumps called papillae, which are easily visible by the human eye. Each papilla is made up of hundreds of taste buds, and each taste bud is made up of 50 to 100 taste receptors.

Although the majority of taste buds are concentrated on our tongues, they're also found on the roof of the mouth, back of the throat, and the inside of cheeks.



Out of date tongue diagram.

The actual sensation of taste can be placed into five major categories; salty, sweet, sour, bitter, and umami (savory). Combining these five basic tastes in varying degrees will creates a "core flavor structure," with complex aromas and tactile sensations adding depth and complexity.

Grasping the five basic flavors and how they interact with one another is to understand flavor structure at its most basic level. It's the combining and balancing of these five flavors that can create a harmonious dish, or an unbalanced flavor profile that just seems to be "missing something."

SALTY

Salt is the most important elemental flavor in cooking because with out it, food just doesn't taste right, not to mention our bodies require it to properly function. Sodium and chloride ions, which together make up common table salt, are used by the body for auto-regulation of water and electrical signaling in the nervous system. Because our bodies retain a base line of salinity for healthy functions, the saliva on our palate contains a small amount of salt, about 0.4% by weight, causing food items that contain less sodium by weight to taste bland or flat.

A great illustration of this effect is baking bread without adding any salt to the dough. Even though the bread is hot and fresh from the oven, it tastes like stale cardboard, as if the bread has gone bad. Yet when salt is added to bread dough, no one ever stops and says "hey, I can taste the salt!"

This is why even a small amount of salt added to food can heighten flavor without contributing a perceptible saltiness. Salt is so important to the cooking process, that without it, great tasting food wouldn't exist.

One of the most rudimentary mistakes made by beginning cooks is under-seasoning food. Most of the time when a dish tastes flat and bland, salt will be the answer.

How much salt should be used? It really depends a lot on what's being made, how it's served, and personal preference. Individuals on low sodium diets are usually more sensitive to salt content than those who are not.

Besides personal sensitivity and preference, a good baseline to follow is about .75% to 1% salt content by weight. This means, if you're making a large batch of soup, you can go through the entire process without adding a single pinch of salt. Once the soup is complete, simply weigh, multiply by .75% (.0075), adding the resulting amount of salt. While I can't guarantee this will yield a perfectly seasoned soup every time (after all, personal preference and other factors such as temperature and fat content will have an effect on seasoning), it will at least get close, giving you a mathematical formula to check your seasoning.

Consider also the temperature at which food is served. Because aroma molecules are more volatile when hot (resulting strong flavor perception), you'll need to add less overall seasoning than the same dish served cold. If you're tasting something hot that you later plan on serving cold, it's always a good idea to slightly over season, as the cold serving temperature will lessen some of the overall flavors. This is why cold items are often enhanced with the addition of a finishing salt, which leads us to a very common question: what type of salt should I use?

Salty Options

Salt is by far the most important ingredient you can have in your kitchen; serving a well-seasoned dish without the addition of salt is impossible. Yet there are so many different types of salt on the market, it's critical to understand which types should be stocked in your kitchen and why.

Technically speaking, salt is salt. While there are various types of sodium based compounds used in cooking (which a chemistry teacher will remind you is still technically salt), the stuff used for seasoning food has the same chemical composition no matter the brand. Made up of 39.3% sodium and 60.7% chloride, there is no *chemical* difference between any number of specialty salts on the market.

If sodium chloride is sodium chloride, then why does some salt cost $30 a pound while others are sold for pennies? In short, size and shape. Salt crystals can come in many different shapes including dense cubes, delicate flakes, and fragile pyramids. It's salt's physical structure makes it special or ordinary, pricey or inexpensive. Let's walk through some commonly available salts and discuss their best uses and applications.

Iodized Salt

Iodized salt (usually referred to as table salt), is commonly found on dining room tables in the ever present salt shaker. It's made up of compact, dense crystals which dissolve slowly on the palate.

To make iodized salt, 1/100th of 1% of potassium iodide is added to common table salt to guard against goiter, a disease caused by an iodide deficiency. However, with the well rounded diets and diverse food sources available to anyone who lives in a first world country, salt as an iodide supplement is no longer necessary.

What's more, iodide will easily oxidize and break down over time. To counter this, sodium ferrocyanide is added along with dextrose to help stabilize the iodide.

Yet in high heat cooking applications such as searing, grilling, roasting, and baking, some of the iodide will still oxidize, breaking down into iodine, which gives off an acrid smell and flavor. If you've ever eaten something that gave a metallic tinge in the back of your throat, chances are, its from oxidized iodide caused by high heat.

Since iodized salt isn't good for cooking, the only other option is using it for "finishing" a dish, meaning it's sprinkled on food right before serving. Yet as we discussed above, iodized salt has a tight, compact crystal structure; its dense, cube-like shape causes it to bounce off food instead of adhering, an important structural trait needed for any finishing salt.

If iodized salt isn't good for most cooking applications and shouldn't be used to finish a dish, then what is it good for? Absolutely nothing. This is why you'll never find iodized salt in my kitchen. If you have some on hand, either get rid of it, or use it up when salting water for pasta or blanching vegetables. But once it's gone, I would recommend making the switch to the work horse seasoner of all professional kitchens, kosher salt.

Kosher Salt

Kosher salt would be more accurately named "koshering salt," since its jagged-crystal structure is produced specifically to stick to the surface of meat during the koshering process. Kosher salt can come from sea or land based salt mines, but it must have coarse, irregularly shaped crystals allowing it to adhere to meat.

Because of its "jagged" crystal structure, kosher salt is predominately what chefs use for all-purpose cooking applications. The large crystals are easy to pick up in the fingertips, and allow you to see how much salt you're putting on the product. It's this same crystal structure and omission of iodide which makes kosher salt ideal for seasoning meat before applying a high heat cooking method.

The Koshering Process

Kosher foods comply with Jewish dietary law (kashrut), one of which states that no blood shall be consumed. Salt by it's very nature is kosher, but kosher salt is specifically milled for the koshering process in which meat is thoroughly washed, soaked in water, salted for a given period of time, and thoroughly rinsed three times.

There are many different brands of kosher salt available, and one isn't better than the other. My only advice is once you find a brand, stick to it, because different companies make kosher salt with various crystal sizes. Switching brands after you've become accustom to another can throw off your feel for seasoning. I've always used Diamond Crystal Kosher Salt, and even measured how much my pinch is, which equates to one gram per finger. This means, a three finger pinch equals three grams of salt, a two finger pinch, two grams, etc. This "feel for seasoning" is especially important

in the fast paced environment of a professional kitchen, allowing cooks to add a consistent amount of salt to every single dish.

Sea Salt

Sea salt and kosher salt are commonly mixed up because their look, shape, and feel are so similar. In fact, sometimes kosher salt and sea salt can come from the same batch of salt, their only difference being the label.

The FDA has no set standard to labeling sea salt, so quite frankly, it can come from the sea or from a salt mine without any legal repercussions. Technically speaking, all salt is sea salt. Salt mines exist due to ancient seas that have since receded or completely evaporated.

With that said, there are some good “sea salts” to be found on the market, and their quality comes from the crystal’s size and shape. One of the most common “finishing” sea salts used in higher end kitchens is Fleur de Sel.

Fleur de Sel (Flower of Salt)

Traditionally, French fleur de sel is collected off the coast of Brittany, hand harvested by skimming a delicate salt layer off the top of sea water before it sinks to the bottom of large salt pans. It has a fragile, pyramid-like shape that burst with a wonderful salty-sweetness when it hits the tongue or is crushed between the teeth while chewing. Because it’s production is labor intensive, fleur de sel is one of the most expensive forms of salt available.

Since fleur de sel’s characteristics come from its size and shape, it’s pointless to use it for cooking. Once Fleur de Sel is dissolved in simmering water (or any other moisture commonly present during the cooking process), its chemical make-up is no different than table salt (minus the iodine and $30 a pound price tag).

For this reason, fleur de sel should always be used as a finishing salt, sprinkled on fresh fruits, vegetables, salads, meats, and fish, right before serving. The salty-sweetness inherent in this special French salt helps coax out the natural flavors of whatever it’s sprinkled on. If a fine dining chef would never work in a kitchen that didn’t stock fleur de sel or an equivalent quality finishing salt, then why should you?

Colored Salts

While perusing the “specialty” or “gourmet” aisles of your local supermarket, you may have come across specialty salts ranging in color from pink, grey, red and black. Most of the salt’s flavor and color are caused by the algae or clay in the salt ponds or mines from which they’re harvested.

For example, Korea and France are known for their gray and pinkish sea salts, while India is known for its black salts. Hawaii is also known for their black and red colored

salts, which are made by the addition of powdered black lava and red baked clay respectively.

You can also buy other specialty flavored salts such as smoked sea salt and truffle salt. The overall quality of these flavored salts can range from “gimmicky” to sublime. Figuring out which is which will take a little trial and error, while at the same time figuring out your personal preference as a cook.

A good example is the smoked sea salt we sprinkle on a ramekin of whipped butter at Stella, and serve alongside our wood fire artisan bread. The smoked sea salt is a great compliment to the fatty butter, and coaxes out the nuanced flavors created by the sourdough starter and wood fire.

Himalayan Pink Salt

Himalayan Salt is a marketing term created for halite, the mineral form of sodium chloride commonly known as rock salt. It’s sold by various companies contracting salt production at the Khewra Salt Mine in Pakistan, the second largest in the world. The pink color is caused by iron oxide, and for years it’s been sold in gourmet markets because frankly it looks cool.

Recently a new trend has emerged among a handful of health food evangelists claiming Himalayan Pink Salt is more healthy to use for cooking and seasoning due to it’s high mineral content. While it’s true it contains quite a few trace minerals our body needs for healthy functioning, the amount of Himalayan salt one would have to consume to achieve the modest recommended daily values of the minerals is literally impossible.

Let’s start our argument with the recommend daily salt intake put forth by the Mayo Clinic of 2.3 grams per person, per day. It’s also recommend that we consume 3500 milligrams of potassium daily, and Himalayan Salt contains about 3.5g per kilo. Since 1000 grams equals a Kilo, here’s how the math plays out:

3.5 divided by 1000 equals .0035 grams (or 3.5 milligrams) of potassium per 1 gram of Himalayan Salt, meaning one would have to consume 1000g of Himalayan Salt a day just to reach the recommended daily intake. If you do the math with similar minerals found in Himalayan Salt, it comes out just as ludicrous. This isn’t to say using Himalayan Salt is bad, but if the sole purpose is for health benefits offered by it’s trace amounts of minerals, then you might want to talk to a doctor about other, more effective ways to

Don’t Confuse Your Pink Salts

There are other forms of pink salt on the market, most notably sodium nitrate and nitrite. These powerful salts are used for curing meats such as sausage, pates, and terrines. In they’re pure form, they appear white, but curing salt manufacturers will usually cut the nitrate or nitrite with sodium chloride and then color with a pink additive. This is to keep you from mixing it up with common table salt, since four grams of sodium nitrite is considered a lethal dose.

increase you mineral consumption.

Long Story Short

- Iodized table salt is useless.
- Use kosher salt for general seasoning and cooking.
- Use sea salt, especially fleur de sel, strictly for finishing a dish.
- Colored salts look cool, but they don't offer much flavor.
- Himalayan Pink Salt may look nice, but isn't an effective mineral supplement.

One last note before moving on: finishing food with a small sprinkling of fleur de sel or other high-end sea salt can be all that's necessary to elevate your dish from good to great. Make sure to stock your kitchen with fleur de sel and try finishing various dishes with a small pinch just before serving. I think you'll be pleasantly surprised how much better a dish can taste with the addition of a little finishing salt.

Other Salty Ingredients

Sodium chloride isn't you're only option for adding salt to a dish. Other effective ingredients include soy sauce, miso paste, fish sauce, parmesan cheese, anchovies, botargo, and other salt cured products like pork belly and back fat. The addition of these ingredients will not only add salt and seasoning to a dish, but also bring into play complex, supporting flavors that sodium chloride can't achieve alone.

SWEET

Sugar and sweeteners can be utilized as an imperceptible seasoning that transcends its traditional, confining role as a dessert only ingredient. In general, sweetness can play an important role in many savory applications. The human palate needs more sweet molecules to register than any of the other five basic flavors. Because of this, a small amount of sugar or other sweet ingredients can be added to savory dishes, helping make the overall flavor structure seem more "round" without a perceptible sweetness.

In fact, a common practice in certain styles of Asian cuisine is to add just a small pinch of sugar, along with salt, to stir-fried vegetables. This imperceptible amount of sugar doesn't necessarily make the vegetables taste sweet, but instead rounds out their flavors, making them taste better.

Sweet can also play a good "Yin" to another flavor's "Yang," bringing an otherwise unbalanced dish into harmony. Sauces such as sweet-and-spicy, sugar added to an

acidic pickling liquid, or the combination of sweet ingredients with piquant (spicy) food, are all examples of how a sweet taste can balance an otherwise intense flavor profile.

Sweet can also balance salt, which is why you'll commonly see it listed as an ingredient in brines, dry rubs, and cures. Meat marinated or brined without the addition of a sweetener can cause an undesirable "burning" sensation when it hits the palate.

As with any other flavor, sugar is more perceptible to the palate when a dish is served hot versus cold. This is why many high-end restaurants have separate freezers specifically for their frozen desserts, which are held at a precise temperature. If the ice cream is too cold, the guest won't be able to fully appreciate the subtle nuances of its flavor.

SOUR

Besides adding enough salt to ensure proper seasoning, the addition of sour ingredients can have a large impact on many dishes, elevating its flavor structure from mediocre to masterful. Some of the major sour ingredients used in cooking are vinegars, citrus fruit, wine (especially white), and verjus.

Verjus is a sour juice pressed from unripe grapes and other fruits. Since verjus was never alcohol, it adds a different element of sour and complex flavor than the traditional vinegars and citrus juice found in the typical cook's arsenal.

Just like salt and sugar can add seasoning and roundness to a dish without being perceptible, small amounts of acid can, and should, be added to almost every dish, whether or not a sour flavor is desired. Just a couple drops of an acidic ingredient can go a long way to brightening and balancing a dish's flavor structure.

Acid is especially important in heavy dishes. Even though fats can add richness and enhance mouthfeel, they also coat the palate, which in turn lessens flavors. The addition of acid cuts through fat, allowing the subtle flavors of a dish to shine through.

Some common acids used to brighten dishes are champagne vinegar, lemon juice, and lime juice. Although there are many more acids one could use to elevate a dish, these three can be added to a recipe much like one would add salt, as an imperceptible flavor enhancer, that elevates the overall taste perception and seasoning.

When getting use to using vinegar or other acids as a seasoning, I recommend keeping a small glass vial and dropper next to the stove, filled with either champagne, sherry or rice wine vinegar. Experiment with adding a couple drops to every dish you cook, until you get a sense of how sour can elevate certain dishes, even when added in imperceptible amounts.

BITTER

The human palate is extremely sensitive to bitter taste sensations since it's commonly associated with poisonous compounds found in nature. Nevertheless, bitter is an important "cleansing" flavor which can add balance, depth, and complexity to any number of preparations. It is commonly used to "re-set" the palate (as in an intermezzo), balance sweetness, and cut through fat.

A common example of bitter balancing sweetness is the addition of hops to beer. Anyone who's ever gone through the beer brewing process and tasted the "wort" before hops were added, understands beer alone is cloyingly sweet and could quickly "fatigue" the palate. Hops are added to balance the sweetness of malted grains, resulting in a more complex and enjoyable flavor structure.

Another common example is the pairings of rich foods and bitter greens, (mainly chicories, a family of greens including endive, escarole, and frisée). The addition of bitter greens not only adds a pleasant, crunchy texture, but it also cuts through fat, keeping a dish from becoming overwhelmingly rich.

Some foods that pair nicely with bitter elements, especially greens, include:

- Charcuterie, specifically pâtés and terrines.
- Dishes with fat-based sauces such as cream, butter, or egg yolks.
- Braised dishes, which normally have heavy, meaty flavors, can be enhanced with the addition of a chicory as a last minute garnish, right before serving.

Since bitter does a great job of balancing sweet, salty, and fatty ingredients, you will often see chicory salads utilizing sweet dressings, fatty cheese, and salty meats.

If a dish seems dull or heavy, a last minute garnish of bitter greens could be the answer you're looking for (assuming you've already seasoned with salt and acid).

UMAMI

In 1901, German scientist Dieter Hanig published an influential paper in the journal *Philosophische Studien,* mapping the human tongue into four distinct regions, each responsible for sensing one of the four basic flavors (salty, sour, bitter, sweet). His paper was translated by Harvard psychologist Edwin G. Boring, and Hanig's "tongue map" quickly become the western world's recognized explanation for how humans perceive taste. But Japanese physics professor, Kidunae Ikeda of the Tokyo Imperial University, thought something was missing from this explanation, and soon had an epiphany that changed the scientific world's understanding of taste and flavor.

While sipping a bowl of his wife's soup, Ikeda realized there was a deeply satisfying, delicious element which tasted neither salty, sweet, sour or bitter. Asking her secret, Ikeda's wife revealed a tin of dried brown algae called kombu, an ingredient traditionally simmered in water or fish stock to create "dashi," the basis of many Japanese soups. It was later found what truly enhanced the "delicious" sensation of so many Japanese soups was the free glutamates kombu naturally produced; so much so it crystalized like salt on the surface of the dried, brown algae.

In 1909, after extensive testing and research, Ikeda's work on kombu was complete. He discovered that glutamic acid was responsible for savory, meaty flavors, and called this fifth taste sensation "umami," which roughly translated from Japanese to "delicious." Ikeda found glutamic acid naturally occurs in the proteins of many diverse food products, and when transformed through cooking, fermentation, or ripening, the protein containing glutamic acid breaks down into glutamate, responsible for savory or umami flavors. Glutamate is also an amino acid produced by the body, working as a neurotransmitter vitally important to learning and memory.

Ikeda stabilized the pure glutamate with the addition of sodium (the same stuff found in table salt), giving birth to one of the world's supreme flavor enhancers, monosodium glutamate, or MSG.

Ikeda patented his process and started selling MSG under the name Aji-no-moto (essence of taste), going down in history as one of Japan's ten greatest inventors, and an extremely wealthy man. Aji-no-moto later become a food additive corporation (now owned by General Mills), and an industry leader. They produce one third of the world's MSG and most recently commercialized the enzyme transglutaminase (aka "meat glue") that is utilized by world class chefs and food manufacturers alike to bind pieces of proteins together.

MSG spread quickly through Asia, used extensively in sauces, soups, and sometimes just sprinkled like salt on food to achieve delicious, umami flavors.

Other Umami Substances

A few years after Ikeda's isolation of MSG, one of his colleagues discovered inosine monophosphate (IMP) in Skip Jack Tuna, smoked, dried and shaved to make katsuobushi, another common ingredient in Japanese dashi.

In 1960, Akira Kuninaka discovered guanosine monophosphate (GMP) in shiitake mushrooms. Kuninaka also discovered GMP, IMP and MSG have a synergistic relationship, meaning when combined, they are more powerful then alone.

In the April 1968 issue of the New England Journal of Medicine, Dr. Robert Ho Man Kwok's letter to the editor detailed strange "symptoms" he would experience shortly after eating chinese food.

According to Ho Man Kwok:

> "*I have experienced a strange syndrome whenever I have eaten out in a Chinese restaurant, especially one that served northern Chinese food. The syndrome, which usually begins 15 to 20 minutes after I have eaten the first dish, lasts for about two hours, without hangover effect. The most prominent symptoms are numbness at the back of the neck, gradually radiating to both arms and the back, general weakness and palpitations...*"

Through his anecdotal observations, "Chinese Restaurant Syndrome" (or CRS) was born. One year after Ho Man Kwok's letter to the editor, Science Magazine came out with an article blaming monosodium glutamate for the ills caused by CRS. Immediately after the article was published, a handful of doctors started asking patients if they recently ate any Chinese food after they described various symptoms including migraines, nausea, numbness and asthma. And that quickly the most paranoid hysteria in the history of food was born; a pervasive fear of MSG, which is quite literally as harmless as the sodium in your salt shaker and the 40 grams of natural glutamate your body produces each day.

A **double blind study** is conducted with the subject and the tester not knowing the product being given. This is considered the most valid process for conducting accurate, scientific experiments, since both the subject and tester can be influenced by bias, whether conscious or subconscious.

Although the safety of MSG has been proven time and time again, many people still claim an extreme sensitivity. The fact is, no double-blind scientific study has ever been able to find any adverse effects linked to the consumption of MSG. According to one study conducted in 1970, 11 people were fed up to 147 grams of MSG a day for six weeks, and no adverse reactions were produced. Numerous studies have been performed on people claiming to suffer from MSG sensitivities and none have shown any evidence to support these claims.

MSG by a Different Name

Because of the stigma attached to MSG, food manufacturers commonly use other names in their ingredient lists including:

- Monopotassium Glutamate
- Glutavene
- Glutacyl
- Glutamic Acid
- Aytolyzed Yeast Extract
- Calcium Caseinate
- Sodium Caseinate
- Anjinomoto
- Ac'cent
- Gourmet Powder

It's fascinating to follow the discovery of umami down the rabbit hole, starting with a simple sip of soup, and culminating in the creation of a misunderstood product while at the same time radically changing our understanding of taste.

So how can a cook use this knowledge advantageously? First, you should be stocking your fridge and pantry with foods containing free-form glutamates such as mushrooms, soy sauce, fish sauce, grapes, walnuts and tomatoes. The next time a dish needs a bit of a "flavor boost," consider adding one or more of these ingredients. Also, don't be afraid or ashamed to stock your pantry with MSG, which in US supermarkets is sold under the brand name *Ac'cent*, or can be found in Asian markets worldwide with the original Aji-no-moto label. Just a little sprinkle in soups and salad dressings may be that extra flavor boost you're looking for.

One commonly misunderstood umami ingredient in Western cuisine is fish sauce. Many Western cooks assume the strong flavor is only applicable when making assertive dishes common to Southeast Asia. This thinking, however, does fish sauce, and you as a cook, a great disservice. A few dashes in a soup, sauce, or marinade can add an unrivaled amount of savoriness without adding a perceptible "fishy" taste.

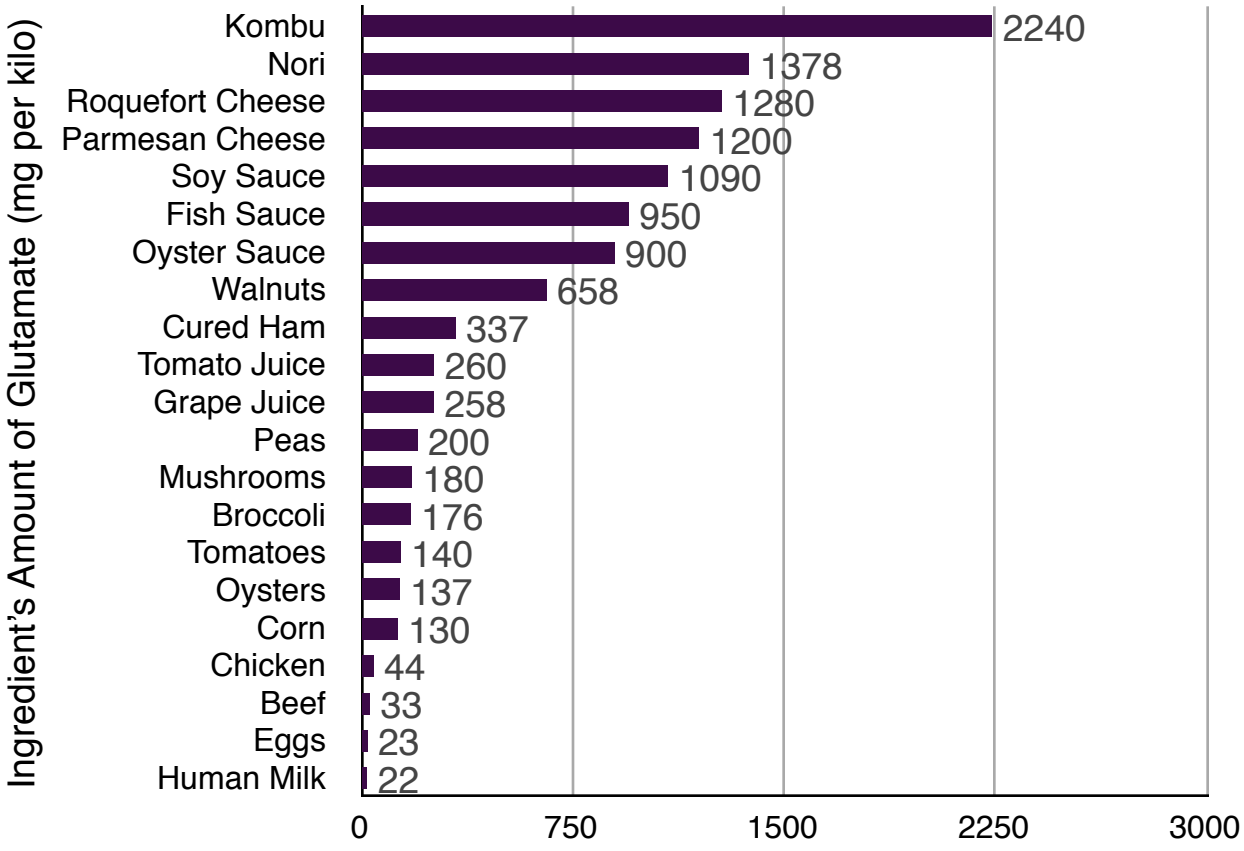
In fact, my version of Neapolitan Tomato Sauce includes four simple ingredients; fresh San Marzano tomatoes, salt, pepper, and fish sauce. Fish sauce and tomatoes have a synergistic relationship; when combined, they create an explosive, umami flavor.

Experimenting With Fish Sauce

Fish sauce isn't just for exotic, South-East Asian Cuisine. Here are a few suggestion for incorporating the umami boosting qualities of fish sauce into your everyday cooking:

- Use a dash or two of fish sauce in conjunction with any recipe that calls for tomatoes (tomato salad, salsa, sauce, etc).
- Add fish sauce to meat marinades and brines.
- Finish soups and sauces, especially meat-based, with a couple drops of fish sauce.
- Be experimental! You'd be surprised what types of ingredients fish sauce can enhance.

UMAMI INGREDIENT CHART



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