How to Salt and Dry Fish


arcticdream.me/2011/10/06/how-to-salt-dry-fish/

October 6, 2011

When I go fishing, I rarely catch just the right amount of fish for one dinner. Sometimes I don't catch anything, so I'd go to the general store in disgrace. Sometimes I catch so much that I feel guilty. When I do have a good day, I need to preserve the extra fish for later, less bountiful days. Surely, preserving food is one of the oldest problems facing humanity. Humanity has indeed come up with many ingenious solutions for preserving food, but most of us urbanites know little about the mechanics of these solution except refrigeration. Maybe we should know. Our ability to preserve food, thus smoothing the ups and downs of seasonal cycles and nature's vagaries into a stable food supply, has made it possible for human population to explode. It's what made possible for yours truly to emerge out of stardust among one billion other people in China.

So you ask, don't you have a refrigerator? Yes we do. But fish loses its freshness very quickly even in a refrigerator. Freezer? I don't like frozen fish. Our small freezer is jam packed with many different kinds of berries anyway. So I started to investigate an older and in my view far superior way of preserving fish: salting.

Salt preserves fish in two equally important ways: by extracting water from the flesh, and by imbuing it with salt. Through the magic of osmosis, salt crystals accomplishes these two things simultaneously. But it's important to think about these two mechanisms separately.

You see, meat goes bad not because the flesh decomposes by itself. It goes back from the bacteria and microbes that feed on it. The bacteria need water to grow, so if you take away the water, you slow or stop the bacteria's growth. Many types of food: grain, mushroom, chili peppers, and unsalted dry cod are preserved by drying alone. Meanwhile, salting also increases the salt content of the meat, further creating an environment inhospitable for bacteria. Salt kills bacteria at the cellular level by dehydrating them. Pickling, for example, preserves vegetables in a salty liquid without needing to dry them.

When you combine salting with drying, which was first practiced by the Basques, fish can be preserved almost indefinitely. Mummies are preserved mainly by salting using natron then dried. Natron is a chemical salt similar to dietary salt, sodium chloride.

Salting Makes Food Tasty

You can preserve meat using formaldehyde (picture jars of grotesque lumps of meat in museums), but you wouldn't want to eat it afterwards. The beauty of salting is that, in addition to preserving food, it makes the food delicious at the same time.

We're genetically programmed to like the taste of salt, because it is one of the few substances that we need to specific seek out, in addition to food, for the body to function. More importantly, in addition to imparting salty flavor to food, salt transforms the food by making it more flavorful. One of my favorite dishes is rehydrated salt cod lightly sauteed in olive oil and garlic. The flavor is so rich, complex and satisfying that it's hard to believe it is cod, a rather bland fish. And there is more! Salt stretches out the protein molecules so they become better at retaining water. Salted chicken is more resistant to overcooking. Magic!

We all know that we need salt to live. There was a case of a child who became severely ill and died because his parents were freaks about having a low sodium diet. But is too much salt bad? Every finger wagging health expert would tell you that salt is bad for you. The chorus of conventional wisdom on salt, endorsed by the government, as it turns out, was based on data from a few studies that show a modest link between salt in-take and high blood pressure. Nutrient "scientists" have a habit of confusing correlation with causality. Latest research show that the health risks of salt have been drastically overstated, and in reality it is probably very mild and varies greatly from person to person. My view is, when it comes to salt, eat what tastes good to you and stop worrying.

Preparing the Fish for Salting

The first step in salting fish is to clean and prepare the fish. After catching the fish, you should take the guts and gills out as quickly as possible and wash it in sea water. Fish guts contain an enzyme that start to decompose the fish as soon as it is dead. You can take the head off and throw it away, but I prefer to leave it on for making soup later. Soup made from fresh cod heads is divine. But I don't eat anything in the head unless it is huge. One friend of mine loves fish eye balls, so after boiling the head for soup, I silently ask for her forgiveness and throw out the whole boiled head with eyes and all.

When I get home, I first wash the fish thoroughly to remove all traces of blood and extraneous membrane. Blood is especially bad based on everything I've read, although I haven't learned exactly why. Then I scale the fish. I do it in a sink with a little fish scaler I bought from Crate and Barrel with the water running, so this way I avoid fish scale flying

outside the sink. I prefer to keep the skin on, not only because I like to eat fish skin but also because it leaves the fish structurally stronger and not fall apart easily. You can always take the skin off just before cooking the fish.

Unless the fish you caught is small, the next key task is to separate the very thick meat above the spine so that there isn't so much meat for salt to penetrate . You can filet it, or butterfly it. I prefer butterflying because it'll be easier to hang for drying. To butterfly the fish, first put the fish headside toward you, and the gut cavity facing you. Use a sharp knife and make two incisions to remove the spine, but don't cut through the skin and the fins on the fish's back. Finally, break the spine very close to the tail, so a little bit of the spine is left on the fish.

Butterflying a Cod

I don't do more preparation like taking out the small bones and and taking off the collar, etc. It is easier to do it when the flesh becomes hard from salting.

Now, the fish is ready for salting.

Impregnating Fish with Salt

The next step is to impregnated the fish entirely with salt. Here, I think the key is to use large grain sea salt, and a lot of it. I have found no official proof of this anywhere, but my own experience tells me that salting anything, like a steak before barbecuing or chicken before roasting, large grain sea salt penetrates far more quickly than regular, fine-grained table salt. Since you'll need at lot of it, find a cheap supplier. In Boston, we used to go to a Brazilian fish market near Kendall Square to buy Brazilian sea salt which come in big plastic bags.

Impregnating Fish with Salt

Before we came to Rødøy, we visited

Île de Ré off the west coast of France, which produces grayish sea salt using traditional, labor intensive techniques. Apparently no metal ever contacts the salt throughout the entire process, but I can't figure out why that's good. In Whole Foods, French grey salt is sold in small bottles for $5 – $10. At a supermarket at Île de Ré, I found the same grey salt for two euros a kilo, (or about $1 a pound). Thankfully, Kristin's sister and her boyfriend were there with a car from Norway, so I bought 8 kilo's of this stuff as our year's salt supply and put it in their car. The shipment eventually made its way to Rødøy via another courier, who no doubt confirmed our madness for the rest of the residents on the island.

Now, on the island, we have 8 kilos of the finest salt in the world which is usually so expensive that it's only used for finishing. That's what I've been using to salt fish. And it does work extremely well. At least as well as the Brazilian sea salt we used in Boston. Recently I found that the general store on the island sells Norwegian sea salt for very cheap but it contains anti-caking agents. I bought a big bag of it, but I haven't tried it yet.

From what I've read, it's important to use enough salt. A few writers wrote about salting too much, which I don't believe is possible, since water can only dissolve 10% of its weight in salt. I'd use roughly 20% of the weigh of the fish in salt.

Virtually all the techniques I found pack the fish between layers of salt in a vat, bowel, bucket — a container that doesn't leak at the bottom. You first put a layer of salt on the bottom of the container, and then lay the fish flesh side up on the salt, and then sprinkle salt liberally over it,and then put another fish over it, and sprinkle more salt, and so on. If you have a lot of fish, you want to arrange them as to leave as little space and possible.

Salted Cod in a Industrial Vat

If you use good salt, after just a few hours, the fish would no longer be in dry salt but in a brine made of the water extracted from the fish. It is important to keep the fish mostly immersed in this brine. You need to have enough salt so that this brine carries the maximum salt concentration. So check and see if there's any salt crystal immersed in liquid. If there isn't, you need to add more salt.

The only exception to the layering technique — and it's a notable one — is a famous book on Charcuterie by Michael Ruhlman, which suggests wrapping a salt-crusted fish in cheese cloth and suspending it over a pan to catch the extracted liquid. I'll try that at some point.

So now, we have clean, butterflied fish in a brine with as much salt as water can dissolve. But how long? The answer is, long enough for the salt to completely impregnate the flesh through and through, and the exactly time period varies a lot. Michael Ruhlman's book says to salt for 24 hours for every inch of meat, which seems like a good rule of thumb. Steinar, the fish master here on Rødøy, leaves it in giant plastic vats for a week in a refrigerated room. In general, higher the temperature, the faster the salt moves through flesh. I salted a good sized cod, the thickest part being 1 inch, for 24 hours at room temperature. It worked fined. But, I don't think it'd hurt to leave the fish in the concentrated brine for a few days longer.

At the end of salting, the whole vat smells briny. Like the sea. There shouldn't be any unpleasant smells. The flesh is much firmer and translucent. Completely salt cured fish will keep for a while. Maybe a week or two. But you can cook it right away, using any salt cod recipe, or just boil it in a lot of water like some Norwegians do. It taste just like dried and salted cod but the meat is not as firm.

Steiner actually double salts his fish. At the end of the first salting, he washes the fish and layer the fish in new salt for another week of two. Some say double salting makes the fish more flavorful. I haven't double salted, but I suspect that the second salting simply extracts more water from the fish so that it'll be faster to dry.

Air Drying

The Vikings didn't have access to cheap salt. Unlike the Mediterranean, the climate here is too cold and wet for producing salt efficiently by evaporating sea water. But they preserved the big cod they caught here by air drying only, without salting. Cod is uniquely suited for drying, because its flesh contains almost no fat, which can turn rancid even if it's dry. Dry cod sustained the Vikings on long journeys at sea, either to discover new continents, or to rape and pillage Britain. I can only imagine how they'd smell after a long journey on open boats and chewing dry cod the whole way. Norwegian dry cod can be "hard as wood planks," so perhaps chewing helped generate some body heat. I'm willing to bet that at least once dried cod served as a weapon for close combat. It is a murder weapon that can be disposed of by ingestion.

My point is, drying alone can preserve fish for a long time. In our woodshed hangs a bag of dry cod that the owner can't date. He said they're now only fit for cats, but I'd eat them if I were starving. Today, Norwegians continue to dry cod without salt, which they call stockfisk. They start in late winter; a lot of it is done in Lofoten, a group of island north of here. They still do it the old way: on wooden racks mounted on breezy hills, rows and rows of gigantic cod straddling them.

The mechanics of drying fish, salted or not, is simple enough: you need the right mixture of low humidity, good air movement, and the right temperature: the same factors that affect drying of cloths. Of these factors, temperature is probably the least important.

Norwegians proved that fish can be dried even when it's very cold. Higher temperature hastens drying, but it also helps the bacteria, which makes it a double edged sword.

I tried leaving the fish drying on our deck, which gets plenty of sun and wind. But birds and cats can get to them. Once I was on the phone with a friend I used to work with, and I had to interrupt the conversation with "hold on a second, birds are eating my salt fish outside. I'll be right back." That gave him a good laugh: of all the conversation interruptors he thought that was the funniest.

The smell of drying fish tends to be not agreeable to other people in the household. Therefore, finding a place to do the drying is a home fish preserver's greatest challenge. Before the autumn rain started here, I salted a cod and then first dried it in the living room, which is decidedly not very wife-friendly. I moved them to the wood shed, which is not ideal, since there is no air circulation. But humidity was low so it worked out.

At the beginning of the autumn rains, I caught a couple medium sized cod, salted them, and tried to dry them in the woodshed. But it was so rainy and wet that a few days hanging in the woodshed did absolutely nothing. When I realized that, I tried to save it by moving it indoors. Starting from the living room, the poor fish, struggling to be preserved, were chased by my wife to the kitchen, then laundry room, back to the living, the kitchen again, and finally to the garbage can because even I agreed that the smell was not good and it was beyond salvage. I nearly shed tears.

So there. It's up to your resourcefulness, and your ability to persuade your significant other, to find a place that is dry, airy, and inaccessible to birds, flies and roaming cats. Serious fish dryers hang them under the roof to keep them from rain, and some put a screen all around to keep the birds and flies away.

Fish Drying Under A Roof