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THE CURIOUS COOK

To Cook an Octopus: Forget the Cork, Add Science

By HAROLD McGEE
Published: March 5, 2008

I FIRST tasted octopus at its meaty yet tender best years ago in Athens, and have made sporadic efforts to replicate that experience ever since.

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My results have been inconsistent, often chewy and fibrous, whether the recipe I followed was Greek, Spanish, Italian or Japanese.

The recipes themselves are all over the map with their advice for making octopus tender. Salting is essential to tenderness, or fatal; brief dips in boiling water tenderize, or long slow cooling, or a rubbing with grated daikon, or the addition of a wine cork to the cooking liquid.

Last week I stumbled on a Greek food scientist's report that small amounts of vinegar tenderize octopus.

A solid lead at last! I decided to revisit octopus and really figure it out.

Twenty pounds of octopus later, I have my own report to offer. Forget vinegar and daikon and dipping and wine corks comically bobbing in the cooking liquid.

Instead, try brining this creature from the briny deep.

Or, give octopus juice a chance to do the stewing.

Like its cephalopod cousin the squid, the octopus has no bones. Most of its meat is in its eight arms, which are so elegant an evolutionary design that they've become a model for robotics engineers, who call them "hyperredundant manipulators."

What's inspiration for a robot designer brings frustration for the cook. Without a skeleton to support the muscles and anchor them with tough tendons, the octopus arm muscles support each other, and the anchoring connective tissues are spread throughout the muscles. They're much tougher than the connective tissues of bony fish.

Octopus connective tissue has to be heated to around 130 degrees before it begins to dissolve into gelatin, and it dissolves quickly only near the boil.

That's why most recipes advise boiling or simmering. I experimented with a variety of temperatures and times, and got the best results at 190 to 200 degrees, below a bare simmer. The arms of a four- or five-pound octopus can take four or five hours to soften.

The Greek food scientist proposed cooking octopus with a little vinegar because its acetic acid dissolves octopus connective tissue. I found that to be true.

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But I also found that vinegar breaks down the resulting gelatin. This leaves the cooked muscle fibers with no gelatinous lubrication, and the meat more fibrous than ever.

When the vinegar treatment highlighted the fibrousness of the muscle fibers for me, I realized they need softening, too, not just the connective tissue.

I read that more than half of the octopus fiber proteins will dissolve in a strong salt solution. So I tried to weaken the fibers with brining. I soaked pieces of arm for a couple of hours in a 5 percent salt solution — about three tablespoons of granular salt per quart water — and then simmered them in plain water until tender. Sure enough, the flesh came out noticeably less fibrous, and not excessively salty.

Brining and gentle simmering work well to optimize octopus texture, but I found that they don't make the most of octopus flavor.

The arm flesh is around 80 percent moisture, which heat releases very easily. When I gently cooked raw octopus in a dry pan, it exuded more than half its weight in juices. And they were attractive and delicious: pale pink from the skin pigments, mildly oceanic, but very savory and mouth-filling with the quality now known as umami. If you cook octopus in water, you dilute those juices and their flavor.

So try this instead. Blanch the unbrined octopus arms for 30 seconds in boiling water, cook them in a covered dry pan in a 200-degree oven for four or five hours or until tender, and cool them slowly in their own juices. Pour off the juices and boil them down to concentrate them. You get tender octopus and a flavorful, colorful, gelatinous sauce. (Brining makes the sauce too salty.)

Both the brined-simmered octopus and the self-braised octopus are consistently good, but not the revelation I remembered from my time in Greece. I thought of one last cookbook truism to test.

Traditional octopus processing often involved beating or pounding the flesh to damage and tenderize its fibers. Modern writers generally claim that freezing does the same thing, and therefore frozen octopus is actually preferable to fresh.

But freezing is known to worsen fibrousness in cod and other fish, and I had a hunch that it might in octopus, too. Maybe the best octopus can only be made from fresh.

Reliably fresh octopus is hard to find, so I ordered two live octopuses direct from the Tsukiji fish market in Tokyo.

They didn't survive the plane flight, but the skin pigments still swirled under my touch and the suckers clung to my fingers.

Blanched for a few seconds and cut thin, a sample of the fresh arm meat was sweetly scallop-like and not too chewy. But cooking turned it bouncier than ever.

After two days of aging in the refrigerator, the rest of the fresh octopus lost its sweetness, and after it was cooked, the texture was still fibrous.

So freshness isn't the key to revelatory octopus. The quest goes on.

Meantime I'm glad to have rediscovered how good everyday octopus can be.

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