



TSUMOTO

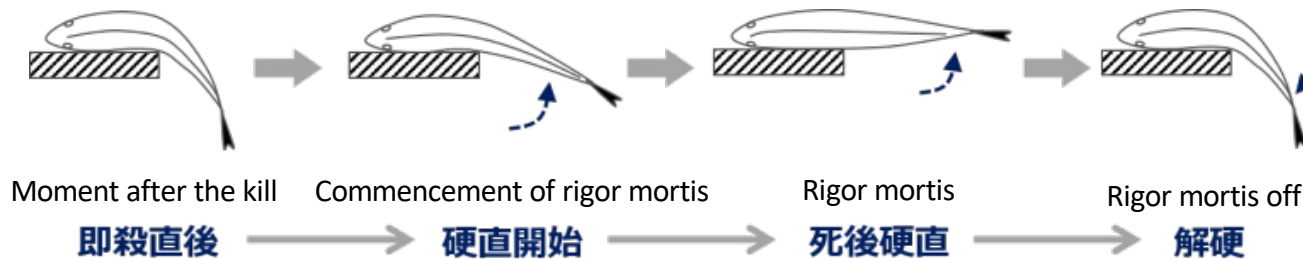
“a method of paralyzing fish to maintain the quality of its meat”

Tokyo Fisheries Federation Seafood Distribution Center



What is freshness?

rigor (mortis) off



- Fish is alive - just after death => Fish meat is soft.
 - After a long time, the body becomes rigor mortis, which is a condition called rigor mortis.
 - The rigor mortis is broken (rigor (mortis) off) ⇒ The body becomes soft again, and proceeds to decomposition.
- *The meat is called "fresh" when it is in the rigor mortis state.

It is true that “freshness” = good taste ? ?

The idea that "freshness = deliciousness" is a crunchy, crispy texture, but little then in regards to umami.

The secret of the original deliciousness lies in umami. Umami, which includes inosinic acid and free amino acids, comes out with the passage of time after death. In other words, "aging" allows us to taste flavors that we could not taste before. However, the important thing to remember here is that not all fish will emerge.

In other words, just because a fish is fresh does not mean it is delicious.

So, what kind of fish will give you the best flavor?

I will tell you from the conclusion. Whether or not the fish has umami depends on whether or not the fish has ATP, the energy source of umami, which is converted into inosinic acid and other umami compounds. Moreover, in terms of inosinic acid, it is said that its content reaches its peak in one to three days.

So how can we produce fish with this ATP?

The difference between a dead fish and a tightened fish

● Dead fish = fish with zero energy

For example, suppose there is a fish floating on the surface of the water, its gills are moving, and it is barely alive. Is this fish tasty?



According to the concept of freshness, it is still alive and fresh. If freshness = good taste...? Then, if time passes, it dies. After that, it undergoes rigor mortis and definitely doesn't taste good. In other words, this fish has zero energy.

It is a fish that has run out of energy and died.
It will be a fish that has no UMAMI at all.

● Tightened fish = dead fish with retained energy

If you kill a healthy fish while it is still healthy, the fish will die with the energy that turns it into a tasty fish. In other words, the fish has the potential to become tasty.



However, this is not the only way to make it tasty.

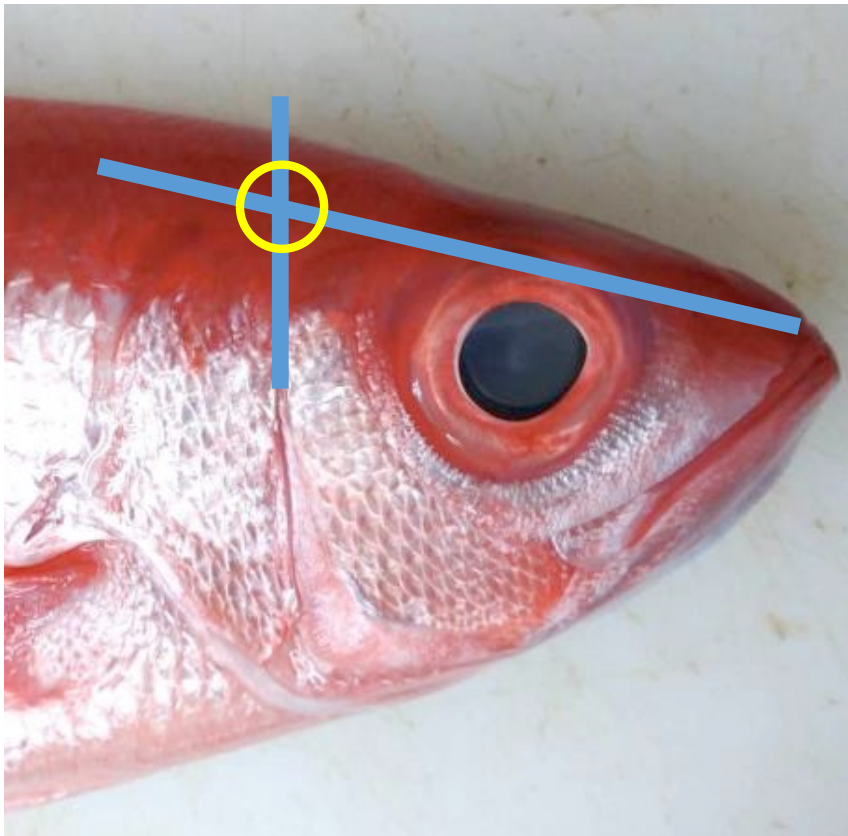
In fact, the way of tightening is important, and what steps are taken after tightening makes a big difference.

The difference is in the steps that are taken after tightening.

のうじめ

1 脳 〃 (NOU-JIME) Making the fish braindead.

It is a "quick kill" without expending any extra energy on the fish. The location of the brain is basically the same for many species of fish. As a guide, there is a hard raised spot at the extension of the line inside the gill slit (the brain pocket is directly below this point), and a softer concavity (temple) slightly above it. This is where the tip of the blade is inserted. When the tip of the blade hits the brain, the fish opens its mouth and becomes rigid. Stirring firmly will also ensure that the brain is destroyed.



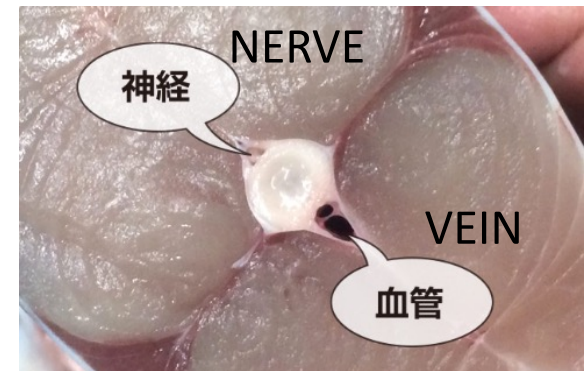
2

神経締め(SHINKEI-JIME) The nerve tightening of fish

If the fish is just brain dead, the nerves are still alive and the fish begins to act out as if it were alive after about 15 minutes. This causes energy to be consumed. To stop the consumption of energy, nerve-closing is performed. This is the true meaning of nerve closure.(nerve tightening)

It does not mean to delay rigor mortis. Fishermen sometimes perform nerve closure from the top of the head or nostrils, but the easiest way to understand it is to cut off the tail (it is easier to process the fish later if the tail is not cut off completely), and a wire is passed through the nerve hole in the upper part of the mid-bone.

※The lower part of the mesonephros is a vascular hole, so it is recommended to cut into the artery from the gills before performing the procedure to minimize the amount of bleeding. If this is done after cutting into the artery from the gills, the amount of bleeding will be controlled and the hole will be easier to see.



3

冷やし込み(HIYASHI-KOMI) Chilling

At the stage when the fish is nerve-tightened, each cellular unit is in micro-motion. This causes energy to be consumed. By chilling the fish, cellular activity is stopped and energy consumption is perfectly This can be achieved.

For smaller fish or when efficiency in fishing is required, the "KOORI-jime" Ice-tightening is used, in which the fish are chilled all at once to kill them. *Ice-tightening: The fish are then frozen with a proportion of seawater ice that does not freeze.

In the treatment of fish, the most important thing is to cool them down.

*It is also an anisakis control measure.



4

The main method of Blood removal(CHI-NUKI)

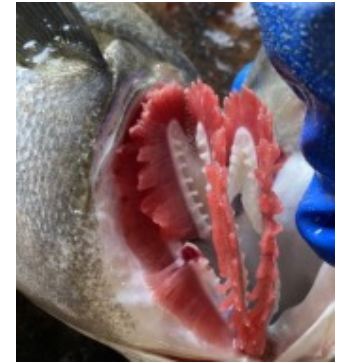
First of all, I would like to tell you that the premise is that draining the blood does not make it tastier. It is said that it bleeds, but it is mostly because of the process of dying, such as being roughed up, bruised, or broken bones. Please keep in mind that the first thing to do is to tighten up and cool down.

1 Fish gill slitting => blood drainage by heart pump

Method: Cut the second gill from the inside and dip it in seawater.

⇒This is a mechanism that uses the power of the heart to expel blood.

- Disadvantages: First of all, since the cause of death is exsanguination, there is a considerable loss of ATP (energy). If this method is used, it should be done after brain clamping. However, the effectiveness of this method is lessened by the fact that blood clots form at the amputation site and blood can no longer flow out, so almost all of the blood can be drained around the heart.



2

Frilly, -bleed out.

Method: Insert the blade at the base of the backbone and gills, and cut the blood vessels and kidney membrane under the backbone. Then, insert a finger into the gill hole and flip the fish left and right in seawater (fresh water) for about 30 seconds. The blood is drained without clotting.

- Disadvantage: It does not drain blood from capillaries. Only the blood in the large blood vessels is drained.



3

津本式血抜き (TSUMOTO-SIKI-CHINUKI) Tsumoto style of draining blood

Tsumoto-style bloodletting is a technique in which the arteries and kidneys along the spine are severed from the top of the gill cover, and fresh water is pressurized and irrigated with water pressure using a hose, etc., starting there, to hemolyze and drain the blood through the osmotic effect of the fresh water. Those who are familiar with the Tsumoto method may remember the scene of blood being drained from the blood vessels exposed in the severed tail. However, this is not important. It is important that water enters and the entire fish body expands. It is not about washing the blood out of the blood vessels. Also, and most importantly, the Tsumoto method allows for an easy approach to the blood, since the blood meat portion of the skin eye is the terminus of the capillaries, and that is where the odor comes from.



5 Chilling and cold storage method



As a general rule,
chilling and cold storage are considered separately!

● 冷やし込み(HIYASHI-KOMI) CHILLING

In CHILLING and ICE-TIGHTENING, it is important to rapidly cool the fish to the core. If you use only seawater and ice, the fish will be too cold and freeze, and if you use fresh water and ice, it will take a long time to chill the fish. Fresh water + ice" will take a long time to cool down. Ice alone" is the slowest method. (Liquid is more advantageous due to the concept of thermal conductivity.)

The same as the method used by fishermen, "half seawater + ice" is used to cool the fish immediately after closing. In a cooler box, half seawater and half fresh water are placed in a cooler. Fill a cooler box with half seawater, half fresh water, and preferably a bag of ice. Place the fish in the box and cool them. If the seawater concentration is too high or the chilling time is too long, the fish may freeze. So, a ratio of 1:1 seawater to fresh water for about 30 minutes to 1 hour should be sufficient.



*Fresh water + ice is fine for freshwater fish.

*From the viewpoint of thermal conductivity, it is faster to cool fish with liquid than with space.

In the treatment of fish, the most important thing is to cool them down.

*It is also an anisakis control measure.

● Maintain cold storage

The fish that has been chilled to the core should be prepped from this point on. The next step is to keep the fish cold. If you intend to use the fish on the same day or within 2 to 3 days, there is no problem in keeping the fish in a refrigerator. When making aged fish, after draining the blood using TSUMOTO-STYLE and others way, wrap the fish in water paper + waterproof paper, put it in a bag as close to vacuum as possible, and store it in ice water. 3° C or lower is said to prevent the growth of bacteria.

1



Carefully, one by one.

2



Wrap with water paper

3



Wrap with waterproof paper

4



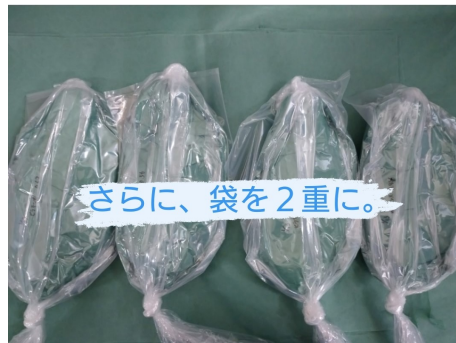
Put it in a thick plastic bag.

5



Inhalation....

6

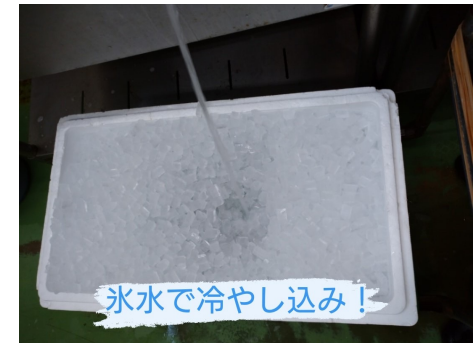


And double up on the plastic bags. In a Styrofoam box for storage.

7



8



Chill in ice water