

Tuna Fishing and Handling

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Tripacific Marine Company Profile

- One of the Biggest Tuna Processors and Exporter from Fiji Island
- Major supplier of Super frozen Tuna to Japan and Europe markets.
- Have 100 plus contracted Long line, Frozen on board facility Boats .
 - -60 °C Boats
 - -35 °C Boats
 - -25 °C Boats
 - Fresh Boats
- Facility
 - 2 Processing factories in Fiji
 - 400 tons of -60 C super frozen cold storage
 - 7000 tons of -25 C cold storage
 - 50 tons per day ice making facility
 - One contract fish processing facility in Vietnam.



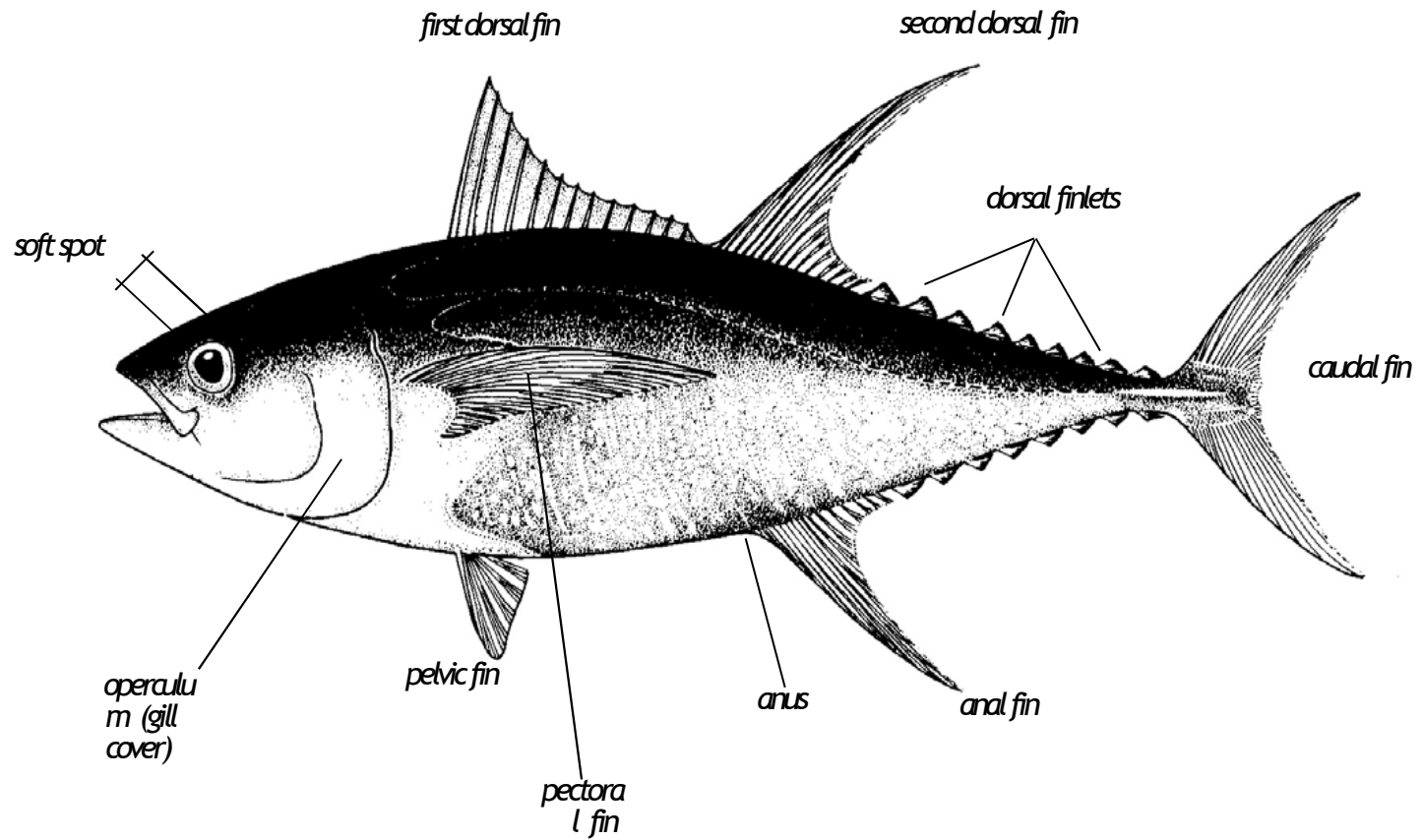
Tuna Fishing and Handling

“Sashimi” is a traditional Japanese dish made from thin slices of premium quality raw fish. The most popular sashimi fish are the red meat species, particularly tunas. “Sashimi” in fact means much more than just “raw fish”; the term implies specific requirements regarding freshness, appearance, presentation, texture and taste.

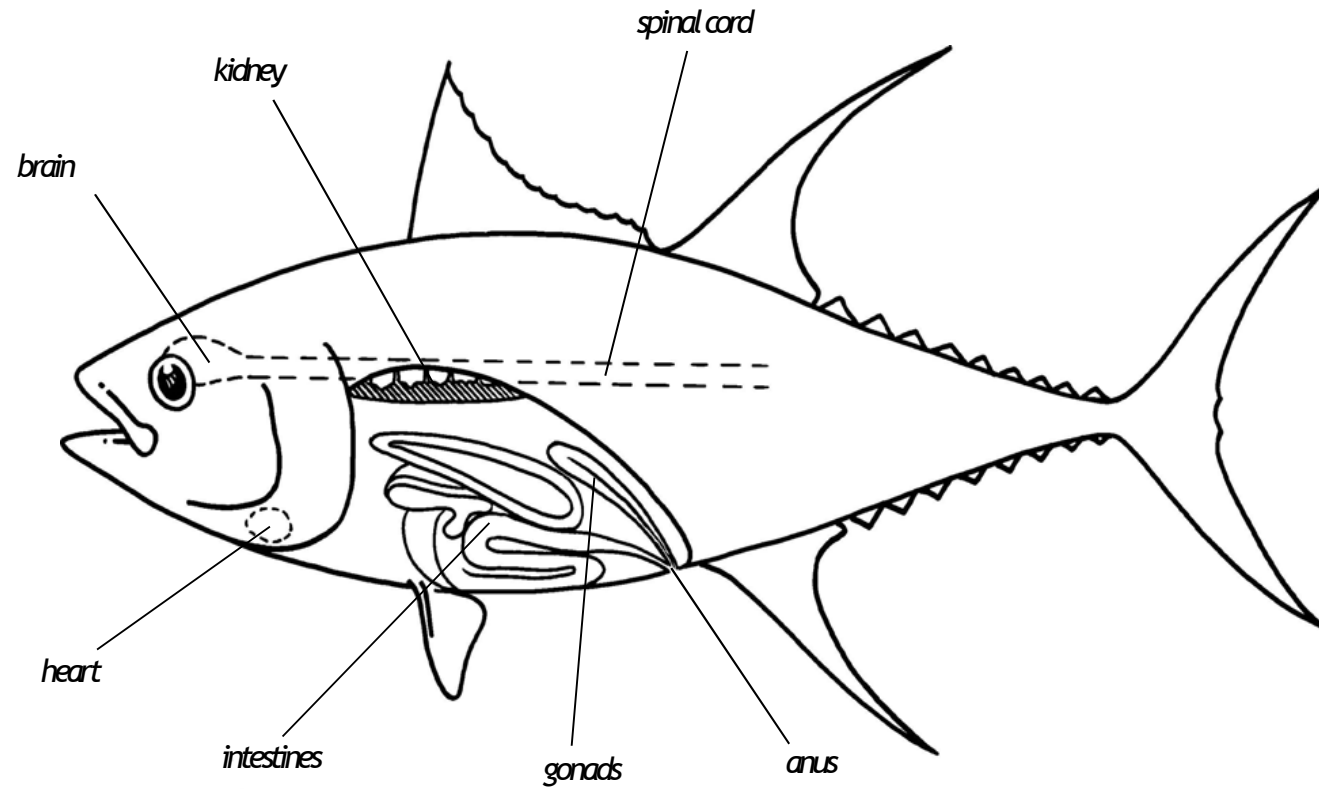
Tuna Fishing and Handling

- Only genuine premium quality fish will fetch a good price on the sashimi market.
- Fish quality is determined by several factors, both biological and non-biological:
 - Biological factors such as
 - Species
 - age,
 - Size
 - degree of sexual maturity
 - presence of parasites or diseasesare not within the fishing crew's control. The size, species and stage of sexual maturity are very important because they influence the fat content of the fish. The tuna with the highest fat content attract the best prices in the sashimi market.
- Non-biological factors
 - fishing method,
 - handling and chilling techniques used after capture.

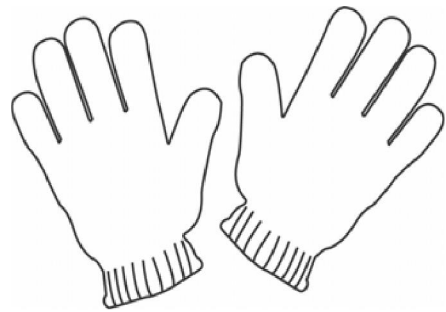
External anatomy



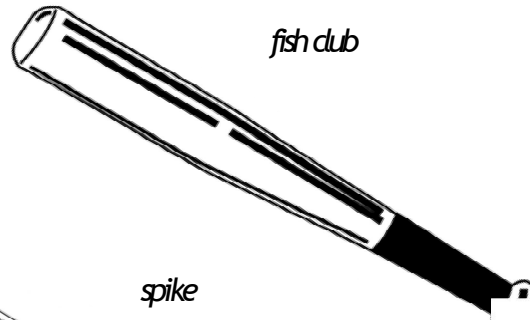
Internal anatomy



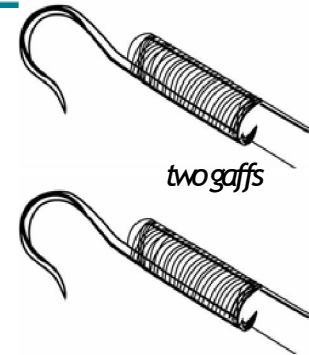
ESSENTIAL TOOLS



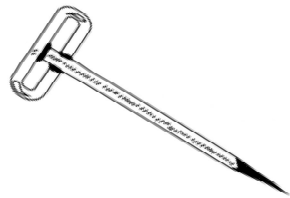
cotton gloves



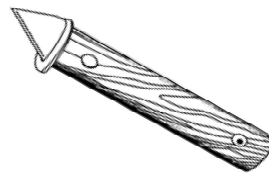
fish club



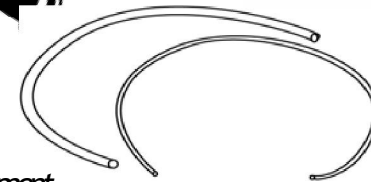
two gaffs



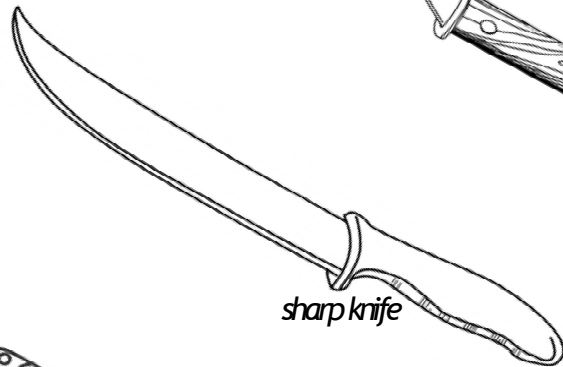
spike



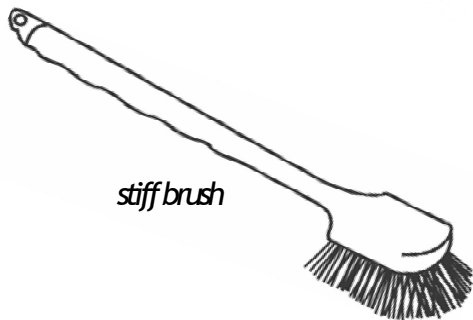
drop blood knife



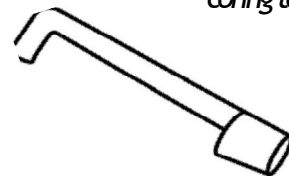
length of monofilament nylon or stainless steel wire



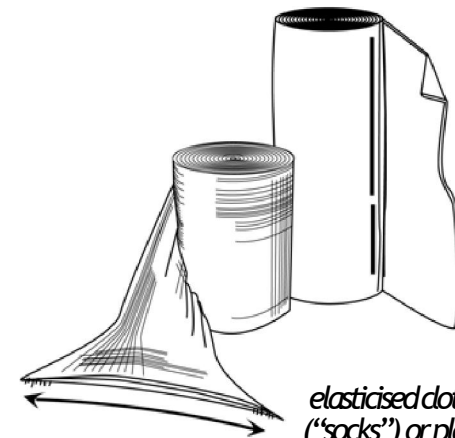
sharp knife



stiff brush



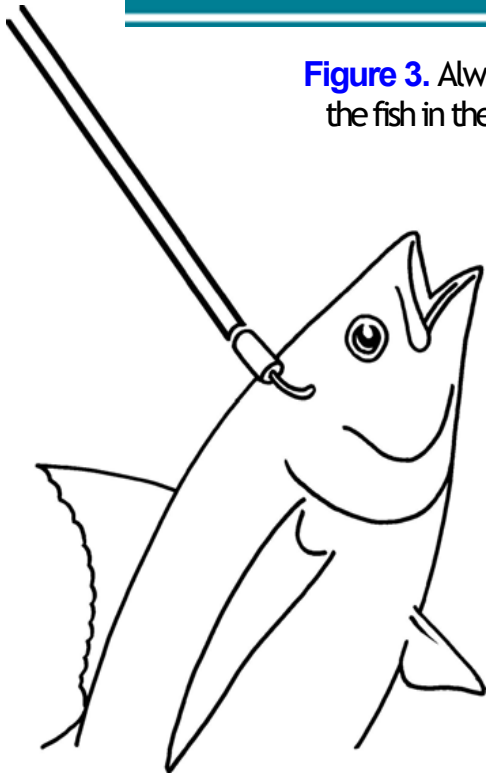
coring tool



elasticised cloth sleeves ("socks") or plastic body bags

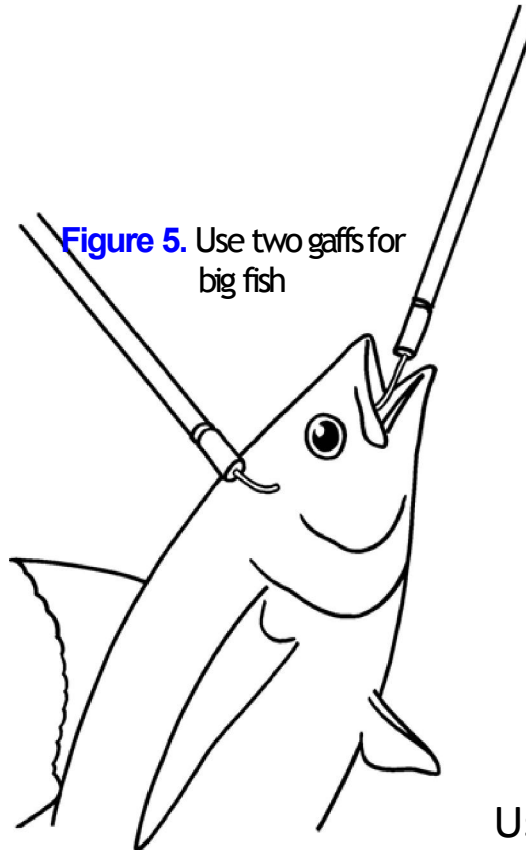
GAFFING AND LANDING FISH ON BOARD

Figure 3. Always gaff the fish in the head



Always gaff the fish in the head (Fig. 3).
Never gaff the fish in the body, the throat or the heart

Figure 5. Use two gaffs for big fish



Use two gaffs for big fish; insert the second gaff in the mouth

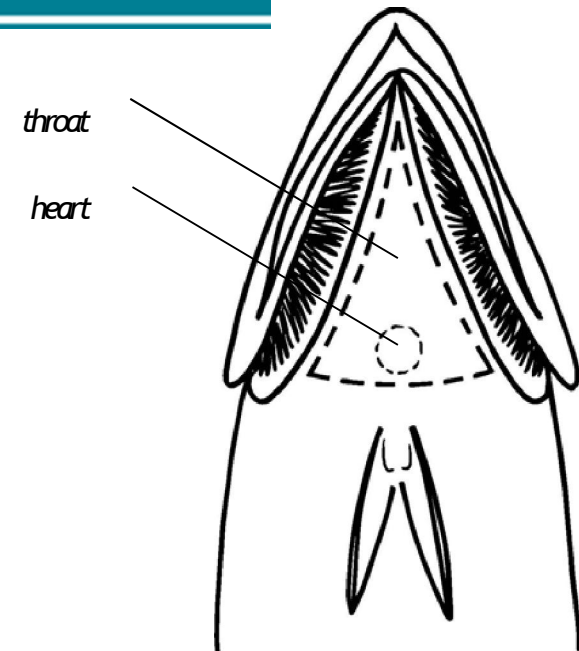


Figure 4. Never gaff the fish in the throat or in the heart

Never gaff the fish in the body, the throat or the heart

KILLING

Figure 6. Stun the fish

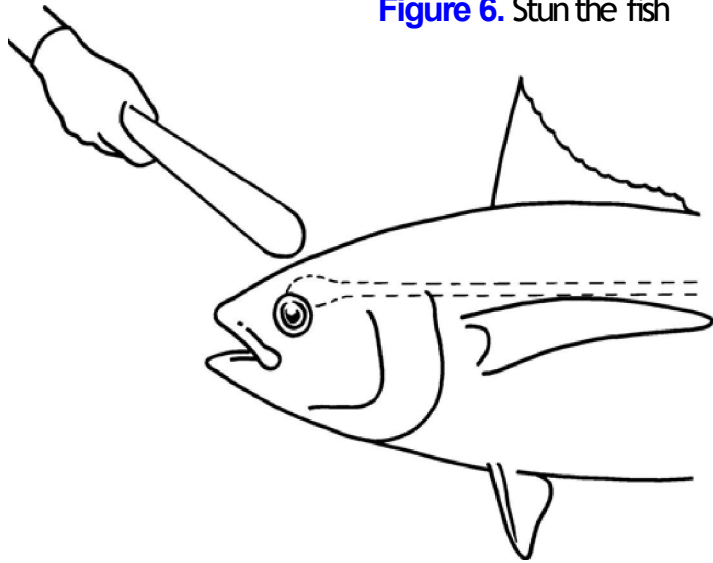
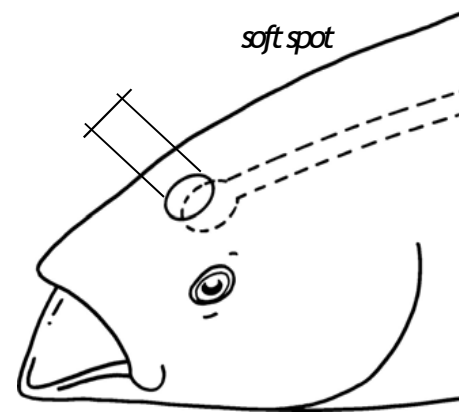


Figure 7. Locate the soft spot



- On arrival at the export market, each sashimi-grade tuna will be very closely inspected. Fish that have not been killed in the way described below will be down-graded, and will lose value.
- To avoid this, the brain and the central nervous system (spinal cord) should be destroyed in all tunas. Stun the fish with a sharp blow to the top of the head (between the eyes) using a fish club. Alternatively, you can calm a fish down by covering its eyes with a gloved hand or a piece of cloth.

KILLING

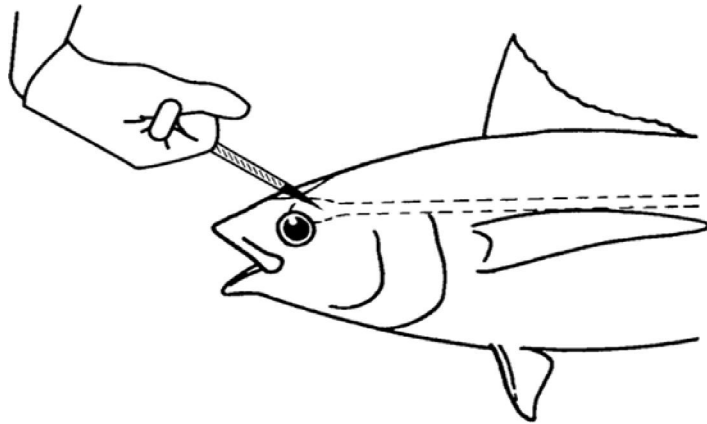


Figure 8. Destroy the brain with a spike

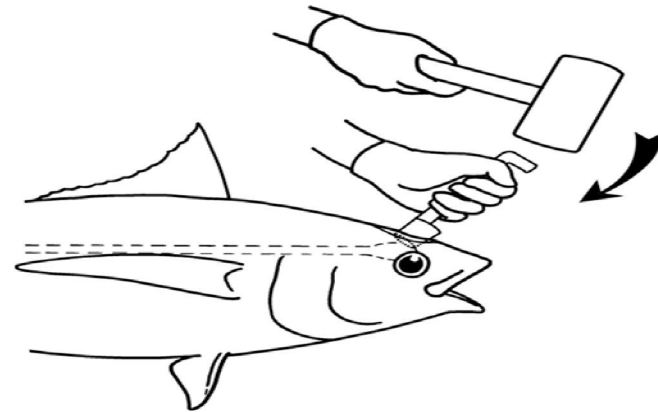


Figure 9. ...or with the coring tool

Locate the soft spot (Fig. 7) by running your thumb over the top of the head, between the eyes. Insert a spike into the soft spot at a 45° angle and push it down into the brain cavity. If the spike is inserted in the right place, the fish will give one last shudder (the mouth will fall open and the first dorsal fin will spread) before going limp (Fig. 8). If this does not happen, the soft spot should be spiked again.

Move the spike around (to destroy the brain) until the body stops moving and the jaw goes slack. Make sure you don't push the spike too deep as it could damage the entrance of the neural canal.

Figure 10. Push a length of monofilament nylon or stainless steel wire into the neural canal

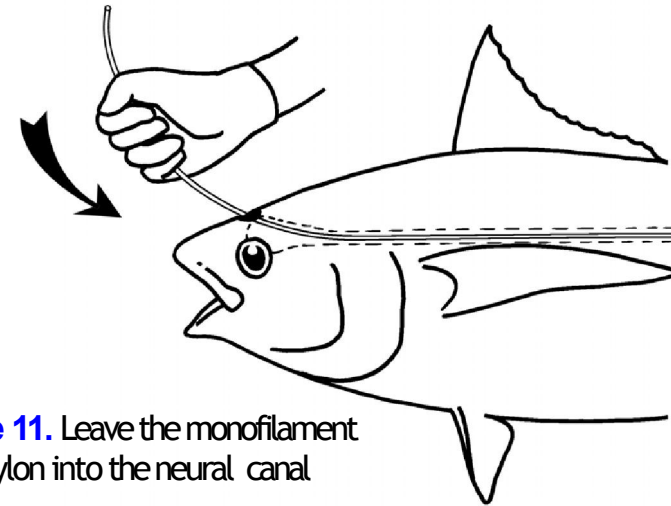


Figure 11. Leave the monofilament nylon into the neural canal

Some operators use a coring tool to destroy the brain and make a hole for the Taniguchi wire or nylon monofilament.

- It is advisable to pith the fish (Taniguchi method) after killing it:
- Insert a length of rigid monofilament nylon or stainless steel wire into the brain through the hole made by the spike or the coring tool, and push it as far as possible into the neural canal to destroy the spinal cord (Fig. 10). The fish should quiver again as the Taniguchi tool goes down the neural canal.
- To “pith” is to completely destroy the spinal cord in the neural canal. This stops the biochemical reactions that contribute to flesh deterioration. Pithing therefore produces a higher-quality tuna.
- Lengths of nylon monofilament (2 to 3.5 mm in diameter; 1 to 1.5 m in length) are recommended for the Taniguchi method.

BLEEDING

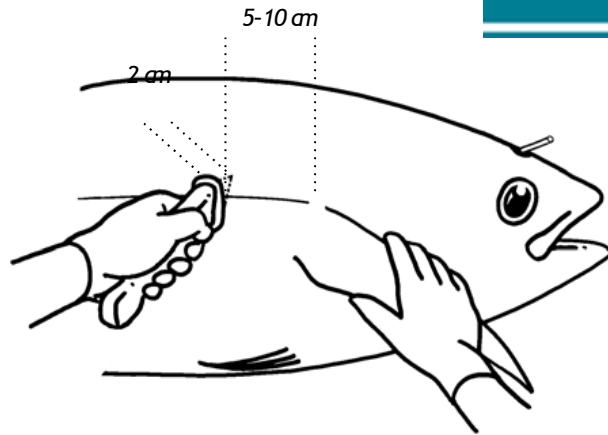


Figure 12. Make a cut with the drop blood knife on each side of the fish, behind the pectoral fin

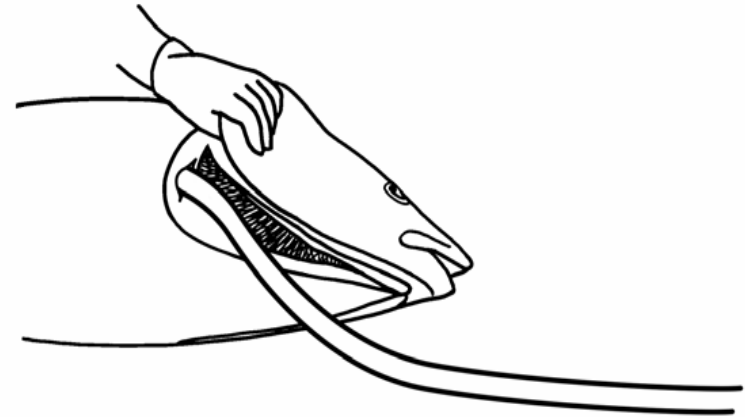


Figure 13. Then make a cut in the membrane between the gill collar and the gills and place a seawater hose in the cut...

Bleeding the fish immediately after killing it improves the appearance of the flesh and extends its shelf life. This is a vital stage for the quality of the fish and its subsequent value on the sashimi market.

- Bleed the tuna by making a cut in its sides with a short knife, five to ten cm behind the base of the pectoral fins. The cut, two cm deep at most, should be made perpendicular to and across the pectoral fin recess, on both sides of the fish . Blood should flow freely from these cuts.

- Leave the fish to bleed for three to five minutes. We recommend this bleeding technique for tunas exported to Japan.

BLEEDING

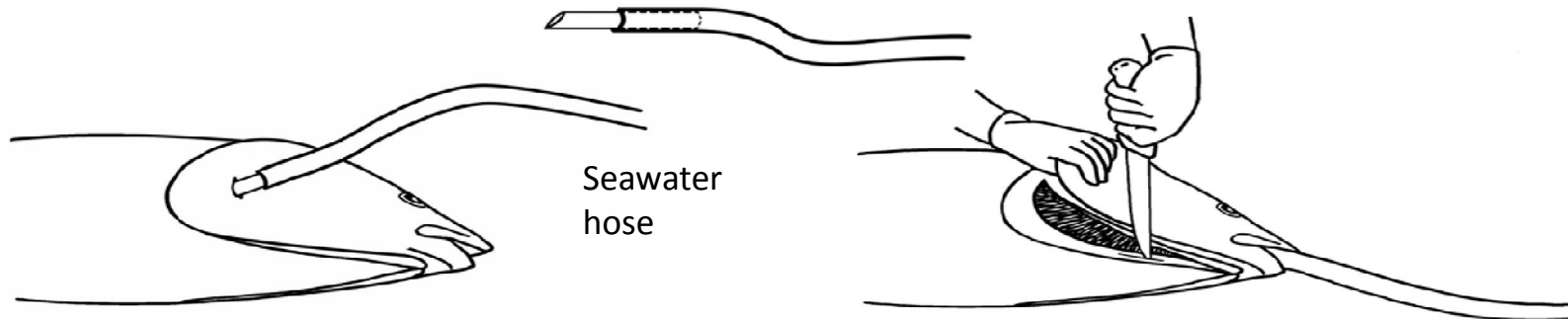


Figure 14. ...or shove a piece of sharpened stainless steel pipe, inserted at the end of a seawater hose, into the gill cover

Figure 13. Then make a cut in the membrane between the gill collar and the gills and place a seawater hose in the cut...

- To accelerate the bleeding process, you can make a cut in the membrane between the gill collar and the gills. Place a seawater hose in this cut to accelerate bleeding and rinse away all blood from the gill cavity (Fig. 13).
- Alternatively, use a hose with a short length of sharpened stainless steel pipe inserted in the end. Shove the pipe into the gill cover in the region where a cut would normally be made. The pipe makes a hole and a seal to pressurise the gill cavity (Fig. 14).

BLEEDING

- After the brain has been destroyed, the heart continues to beat for a few minutes. These cuts should therefore be made as quickly as possible to allow the last heartbeats to pump the blood out through these wounds.
- Any sashimi-grade tuna specialist can recognize a tuna that has not been bled (or which has only been partly bled) by the presence of unattractive dark red veinlets in the flesh.
- When the tuna is struggling in the water, before being hauled aboard, the blood attains a high organic waste (lactic acid) content and rises in temperature (up to 35°C in some cases). Bleeding removes the organic waste and helps to cool the fish's body. The fish can then be refrigerated quicker and will have a better- quality flesh.
- A pair of major blood vessels run along the pectoral fin recess immediately underneath the tuna's skin. These vessels will easily be severed if the knife is inserted perpendicularly to the fin recess. Also, the mark left on the fish will be perfectly visible to the buyer, who will not have to lift the pectoral fin to look for it.

GILLING and GUTTING

Figure 16. Make a cut 5-10 cm long, to 1 cm from the anus

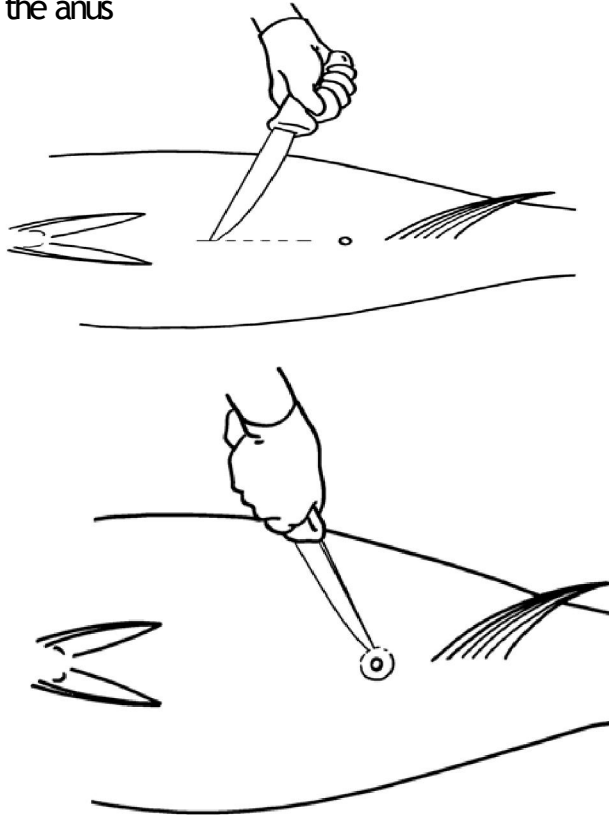


Figure 18. Alternatively, make a circular cut around the anus

Figure 17. ... then cut off the end of the digestive tube

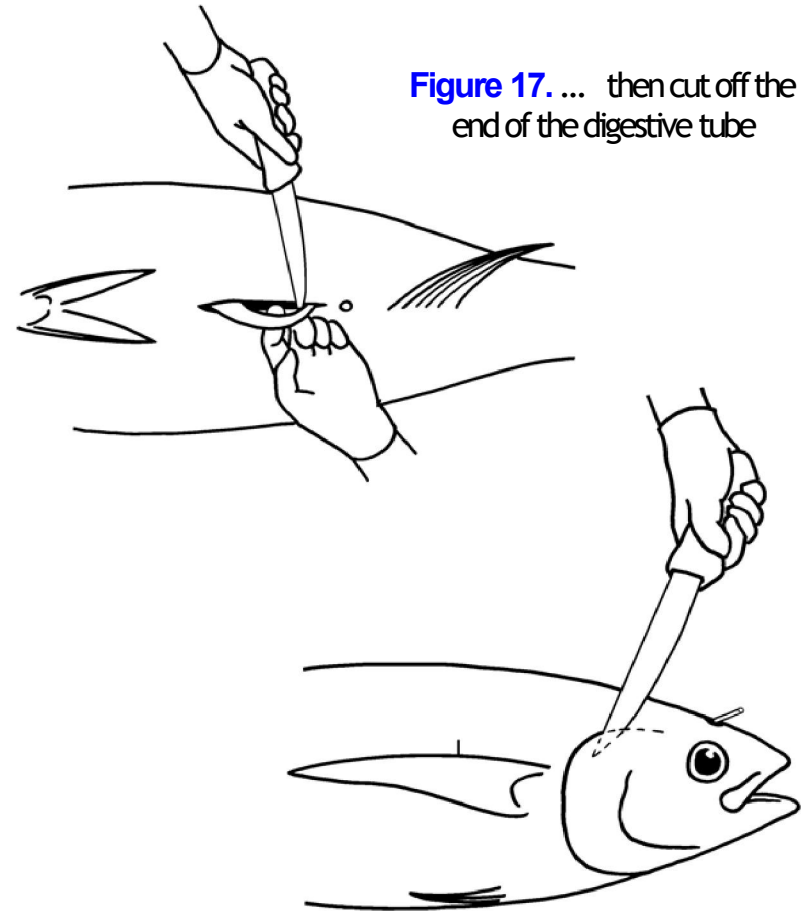


Figure 19. Insert your knife behind the gill cover, and cut forward until the knife hits bone (the skull). Repeat on the other side

GILLING and GUTTING

Figure 20. Cut the membrane between the gills and the gill collar, on both sides

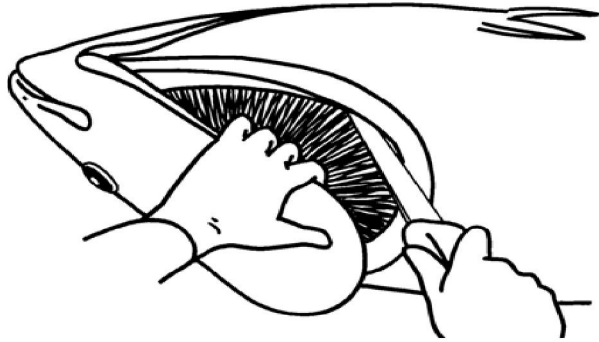


Figure 21. Cut the connection between the gills and the lower jaw

Isthmus (don't cut)

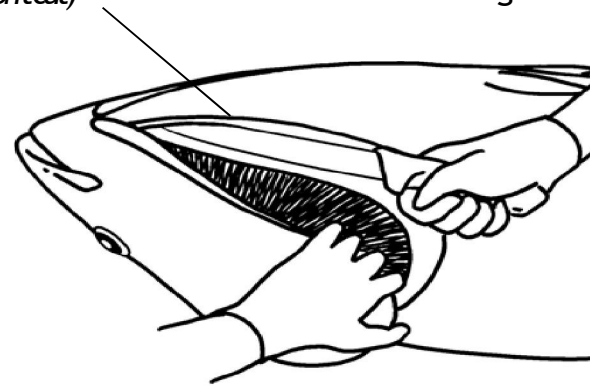


Figure 22. Cut the connection between the gills and the base of the skull

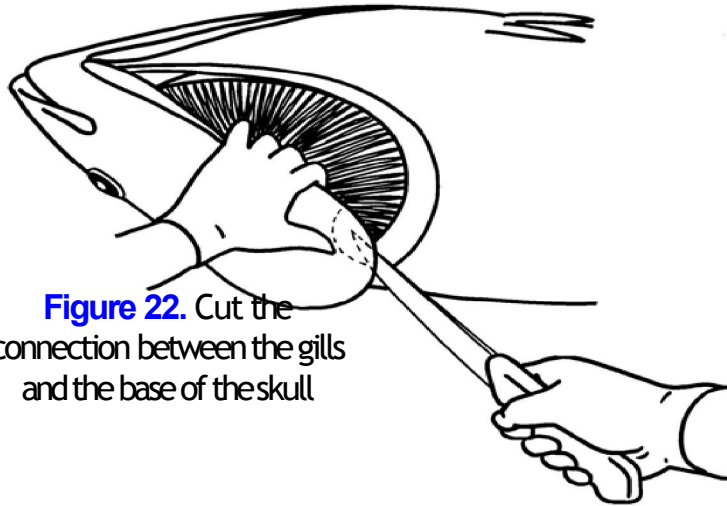
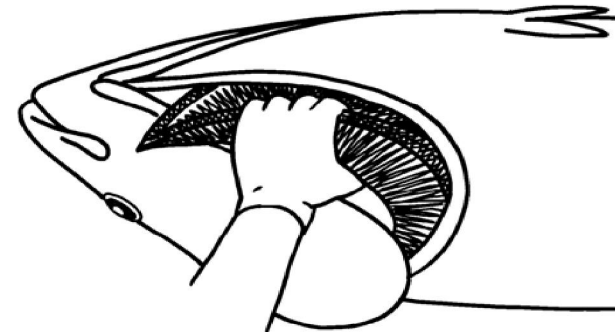


Figure 23. Remove the gills and the internal organs in one piece then remove the heart



CLEANING

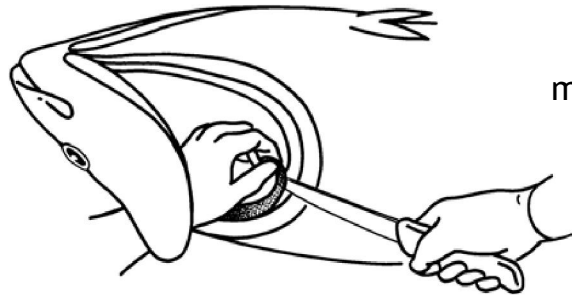


Figure 24. Cut the membrane adhering to the gill collar, on both sides

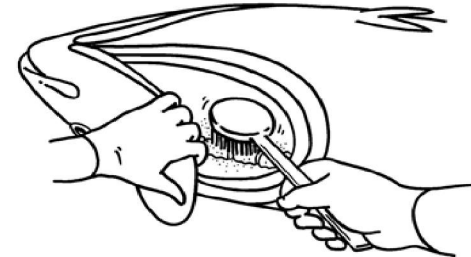


Figure 25. Scrub the base of the skull and the vertebrae, removing all blood and kidney.

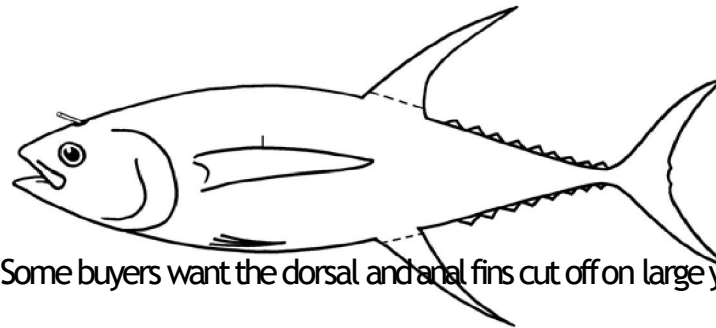


Figure 26. Some buyers want the dorsal and anal fins cut off on large yellowfin tunas.

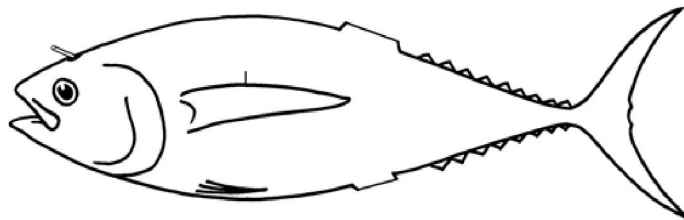


Figure 27. The fish is ready to be put on ice

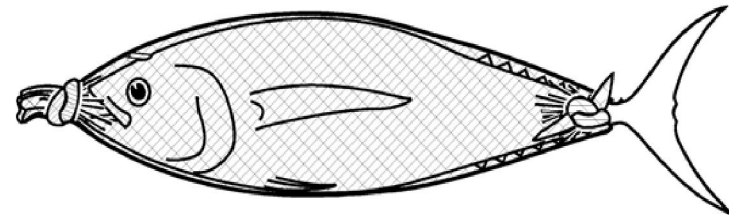


Figure 28. The fish is ready to be put in the slurry or in RSW

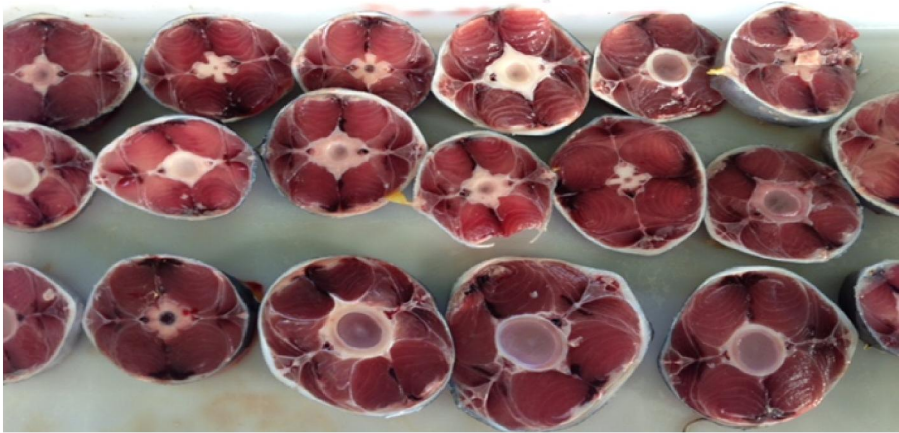
ONBOARD STORAGE

Tunas are the most evolved species of fish in that they control their internal (body) temperature¹. This internal temperature can even rise to 30°C+, for short periods of time, under certain conditions (e.g. during a feeding frenzy or during capture). In order to keep the fish in pristine condition, the internal temperature must be lowered as quickly as possible to 0°C and then maintained during onboard storage, unloading, packing and transport.

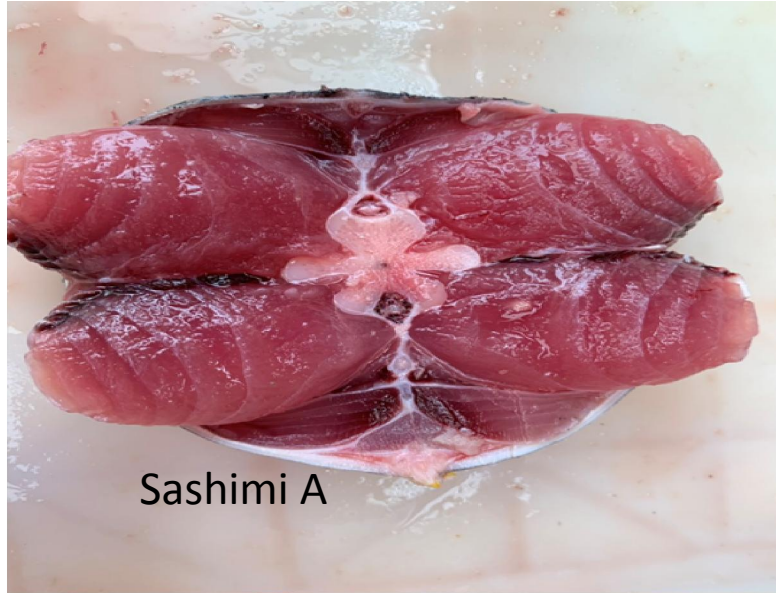
- To obtain a top-quality product, recommend using the following two-stage procedure:
Lower the internal temperature of the tuna by placing it in a slurry of flake ice and seawater (2 parts ice to 1 part seawater).*
- After 24 hours, transfer the tuna to the fish hold and ice it. No further handling is required until you arrive in port.*

Unlike other fish, tunas are “warm-blooded” or endothermic fish. This means their internal temperature can be kept above the temperature of the sea water surrounding them – other fish do not control their internal temperature which is constantly equal to the ambient temperature. This is especially important for tunas leaving in cold waters as this mechanism keeps the body temperature at a level where the bio-chemical reactions that control the muscular activity of the fish are the most efficient.

Natural Wild Caught Tuna



Tuna Tail grading



Sashimi A



Sashimi A



Sashimi B



Sashimi B

Tuna Tail grading



Natural Wild Caught Tuna



Tuna loins skin on

- Boneless, belly off, blood line removed, tail trimmed to 1 - 1.5inch diameter,
- Loin sizes 3-5lbs, 5lbs up
- IWP,IVP, packed in 30, 50, 55lbs master carton



Tuna loins skinless

- Boneless, belly off, blood line removed, tail trimmed to 1 - 1.5 inch diameter · Loins sizes 3-5lbs, 5lbs up
- IWP,IVP, packed in 30, 50, 55lbs master carton



Albacore Tuna loins

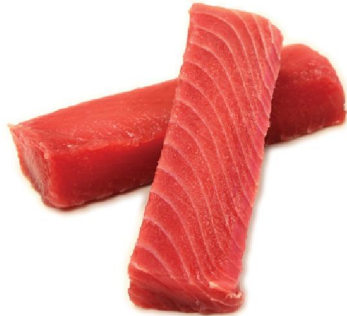
- Skinless, boneless, blood line removed, Full Belly off or 50% trimmed, tail trimmed to 1inch diameter
- Loin sizes, 1-2lbs, 2-3lbs, 3-5lbs, 5lbs up
IWP, IVP, packed in 25lbs, 55lbs master carton



Tuna loins Center Cut

- Skinless, boneless, bloodline removed
- Size 3-5lbs, 5lbs up ·IVP, IWP, packed in 30 or 50 or 55lbs master carton

Natural Wild Caught Tuna



Tuna Saku

- Skinless, boneless ·Saku sizes ·Height: 1-1.5 inch
- Width: 2-3 inch ·Length: 6-7 inch
- IVP, packed in 10lbs master carton



Tuna steaks

- Skinless, boneless ·Steak size, 3 Oz, 4 Oz, 5 Oz, 6 Oz, 7 Oz, 8 Oz, 9 Oz, 10 Oz·IVP, packed in 10lbs, 25lbs or 40lbs master carton



Yellow fin Tuna Gilled & Gutted (GG)/ Big Eye Tuna Gilled & Gutted (GG)

- Onboard frozen at minus 60/-35 degrees
- Tuna is caught & processed & immediately frozen in the boat

Natural Wild Caught



Premium Treated Tuna



Tuna Saku Blocks

- Size : width 2-3 inch, Length :6-7 inch,
Height :1-1.5 inch
- Packing : IQF, IVP, 10lbs boxes



Tuna Loins Center Cut

- Skinless, Boneless, Bloodline removed
- Size 3-5lbs, 5lbs up ·IVP, IWP, packed in 30 or
50 or 55lbs master carton



Tuna steaks

- Skinless, Boneless · Steak size : 3 Oz, 4 Oz, 5 Oz,
6 Oz, 7 Oz, 8 Oz, 9 Oz, 10 Oz
- IVP, packed in 10lbs, 25lbs or 40lbs master carton



Tuna Poke Cubes

- IQF , $\frac{3}{4}$ inch x $\frac{3}{4}$ inch , or 1 inch x 1 inch
- Packed in 1 or 2lbs / Vacuum pack,
- Packed in 10lbs master carton

Ready To Eat Products



BAD HANDLING



Tuna Market Potential

- Global Tuna Market Size : US\$ 11.59 Billion (2018)
- 60% of Total Tuna comes from west & Central Pacific Ocean.
- Canned Tuna (2.5 million tons of fish majority caught from purse seine) is holding the largest share and in demand due to affordability and shelf life.
- 580 Industrial Scale tuna Purse seine Vessels in 4 major oceans
 - Western and central Pacific (257)
 - Eastern Pacific Ocean (226)
 - Indian Ocean (55)
 - Atlantic Ocean (40)
- Global Purse seine catch accounting for around 66% of total global catch.

Tuna Market Potential

Sashimi Tuna

- Global Market size -500,000 mt
- 80 % imported by Japanese Sashimi Market
- Japanese and Taiwanese long line boats are top two supplier
- Other Significant long line fleet includes Korea, China and Indonesia.
- Two types long line in Sashimi tuna business
 - Large Scale Distant water Vessels
 - Small –medium scale offshore vessels
- Estimated 60 to 100 tons supplied non Japan Sashimi Market, they are USA, Europe, Taiwan, Korea.

Challenges in Tuna Industry

- Resource sustainability issues
- Stricter Regulatory requirement
- Increasing Operating Cost
- Developments in Consumer Demand
- Preferential Market Access
- Serious Profitability constraints
- Volatile market condition
- Competition from farmed tuna

Thank You