



Regional Dialogue on Management of Highly Migratory Fish Species in the Bay of Bengal

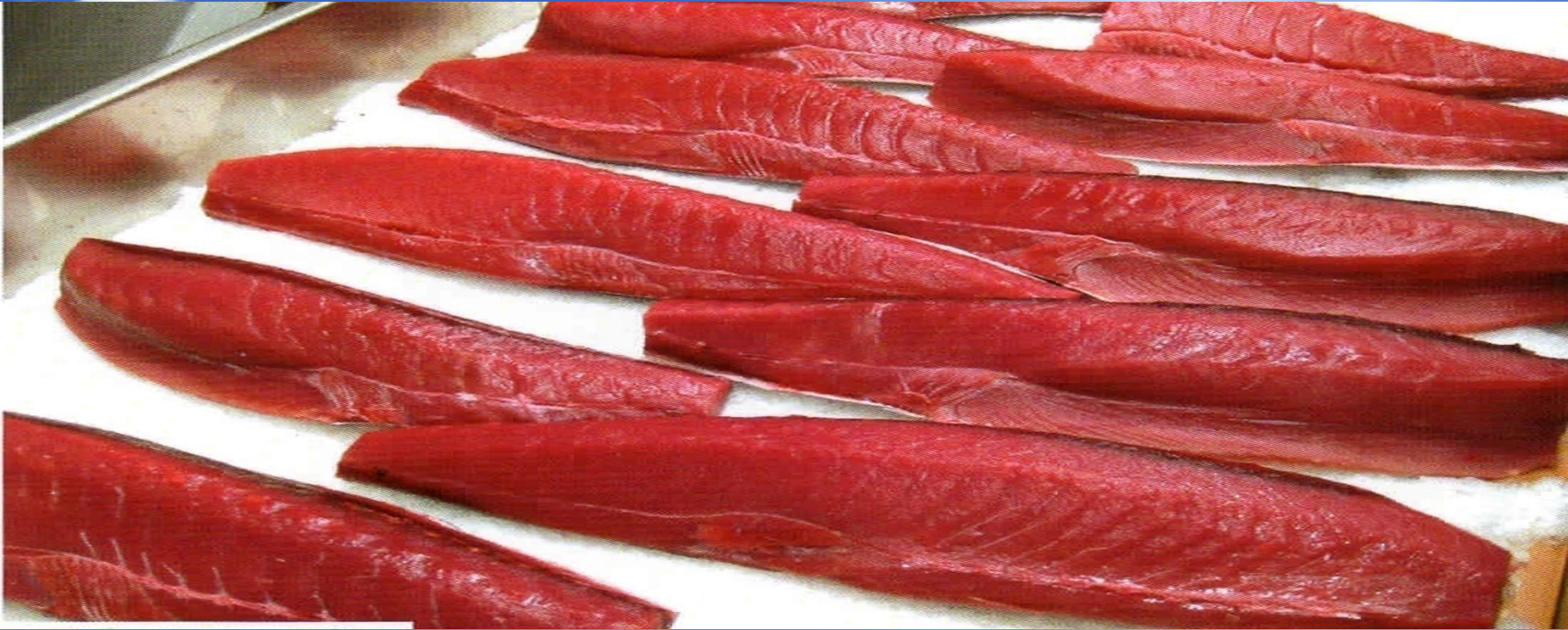
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Value Addition in Tuna for Marketing of High Value Products

Moon Fishery India Private Limited



Value Addition in Tuna for Marketing of High Value Products



Dr. M.K. Venu

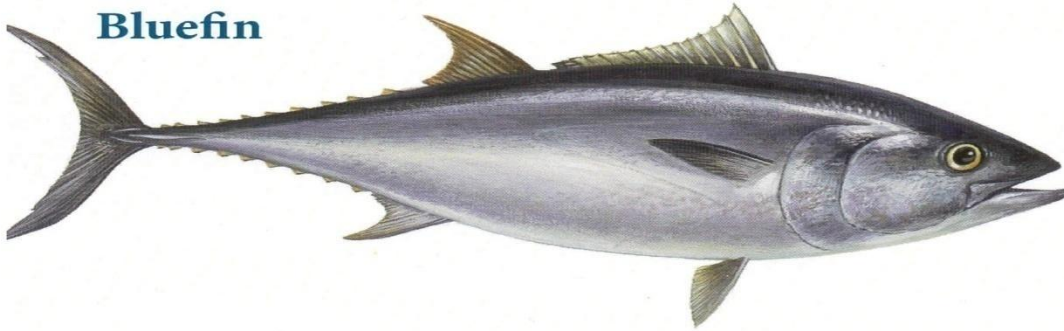
Moon Fishery India Pvt. Ltd.

- Sashimi and sashimi products are the highest priced tuna products.
- Sashimi means raw eating meat.
- Quality of Tuna suitable for sashimi/sushi must be supreme.
- So value addition in tuna means to keep high quality.
- In 2017 Tokyo's Tsukiji market sashimi tuna sold \$2981 per kg which is the highest price ever got.

Bigeye



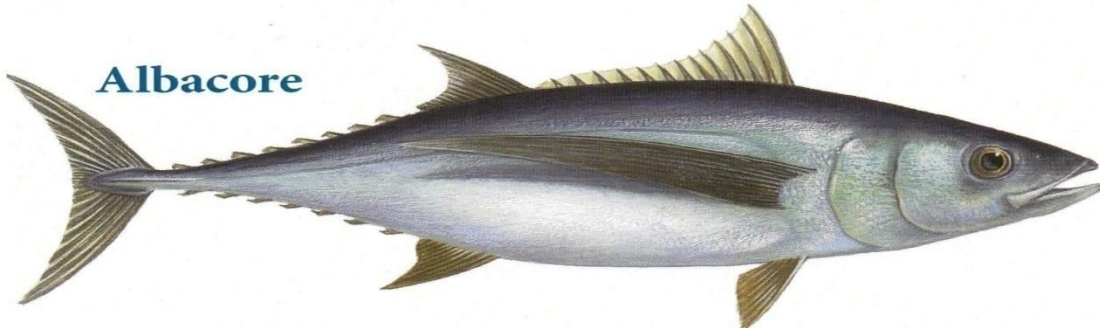
Bluefin



Yellowfin



Albacore



**Species of
Tuna
generally
used for
Sashimi**

Grading and Evaluation of Tuna

- Tuna is graded according to quality - 1, 2 & 3

Freshness

❖ Colour

Grade1



Grade 2



Grade3



❖ Size and Shape

Grade1(a)



Grade2(b)



Grade3(c)



(a) Shape will be round with thick belly & weigh 25kg up

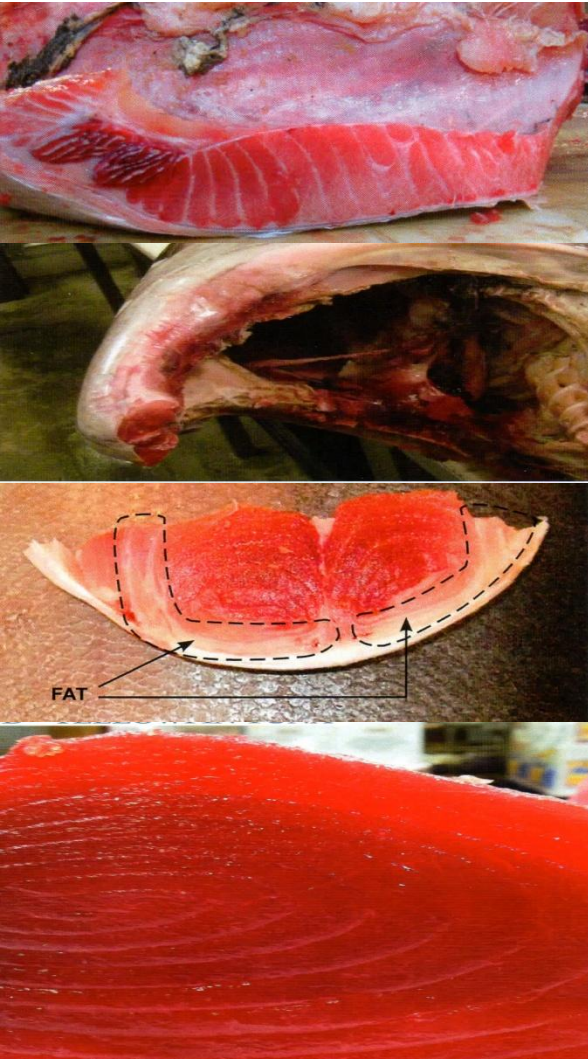
(b) Long, thin or curved fish

(c) Any size and shape fish

❖ Fat

Grade1

Visible fat in belly, nape, tail and white marbling in meat



Grade 2

Thin belly, nape and non marbled fat in meat. – No visible fat



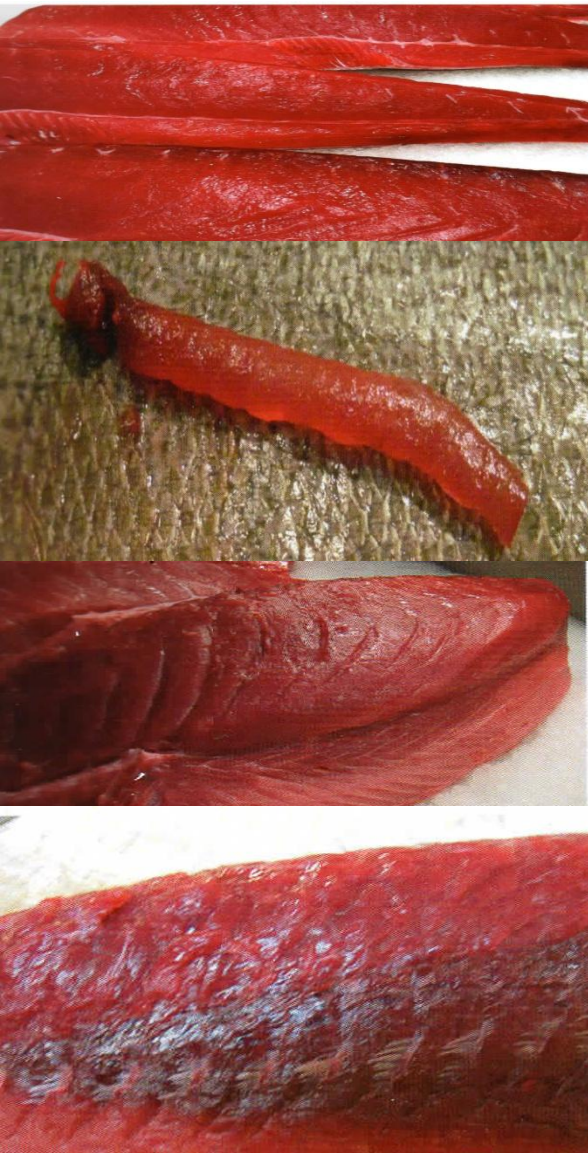
Grade3

Very lean meat – least fat content



❖ Meat Colour

Grade1



Grade 2



Grade3

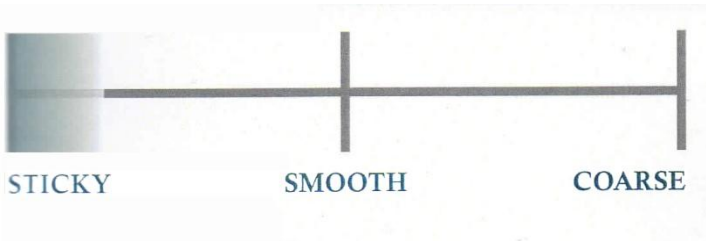


❖ Texture

Grade1

Grade 2

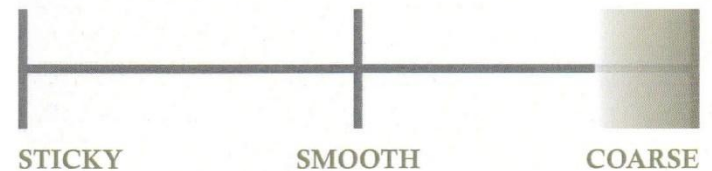
Grade3



Meat must be fine texture with clarity, easily felt fat and core meat sticky to the touch



Meat feels lean due to less fat, low smooth and less wet



Meat is dry – outside fat may be added when consumed

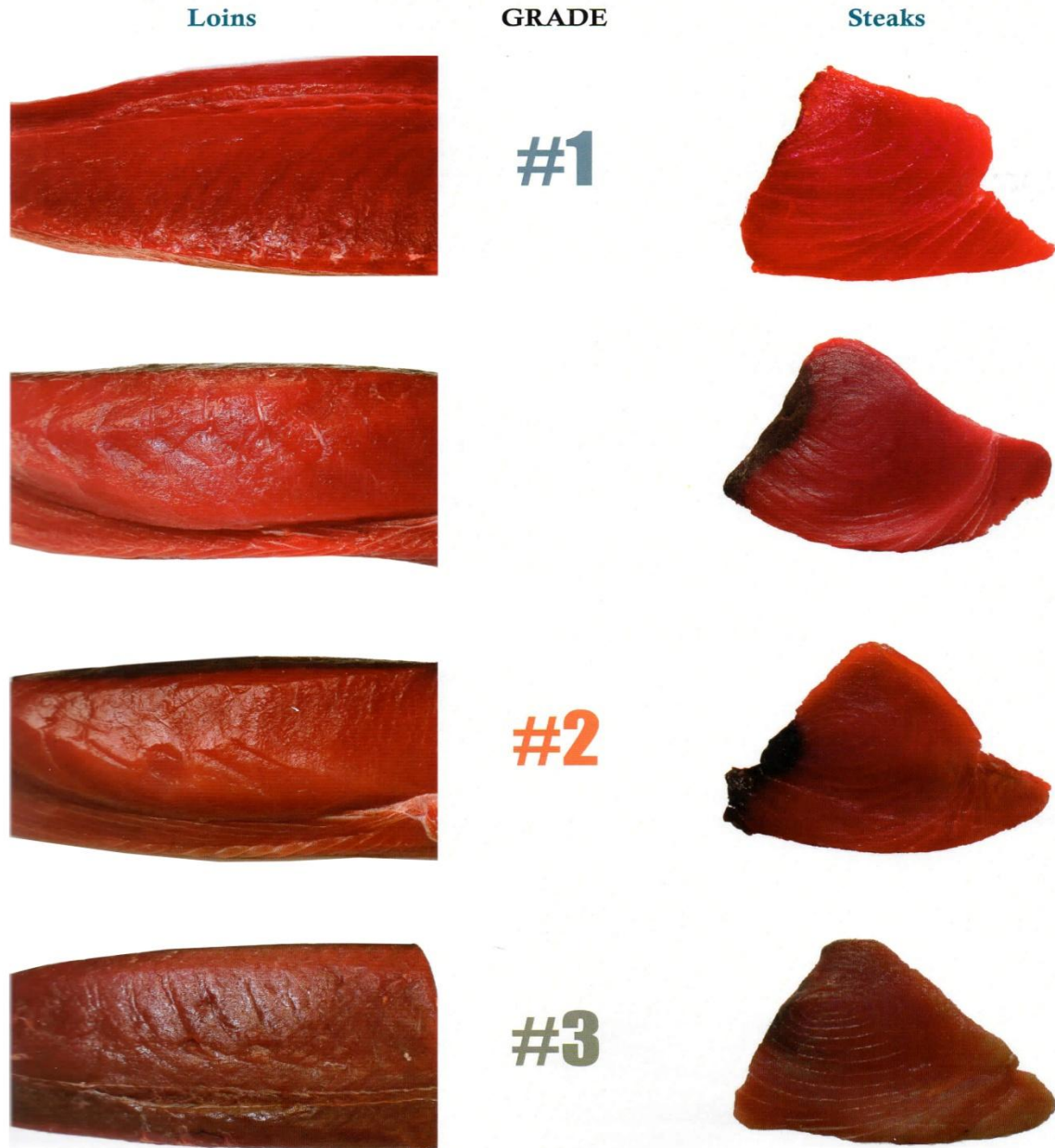
Loins

Most of the retailers and restaurants prefers loin than fish.

- Entire portion edible
- Skilled expert is not required
- Any quantity can be purchased

Chilled fish generally long shelf life (one week) than loin(2 days),as fish stay fresher longer if it stays with bone. Myoglobin is the red pigmented protein that store oxygen and the red colour is due to the oxygen content present in it. Tuna may have a dark purple colour when first cut due to deoxymyoglobin which in air turns to bright red oxymyoglobin. However bright red colour turns to brown after some time because myoglobin is not getting oxygen (fish dead) and oxymyoglobin become brownish colour metmyoglobin.

Grading and Evaluation of Loins



Comparisons

Tail Cuts

GRADE

Core Samples



#1



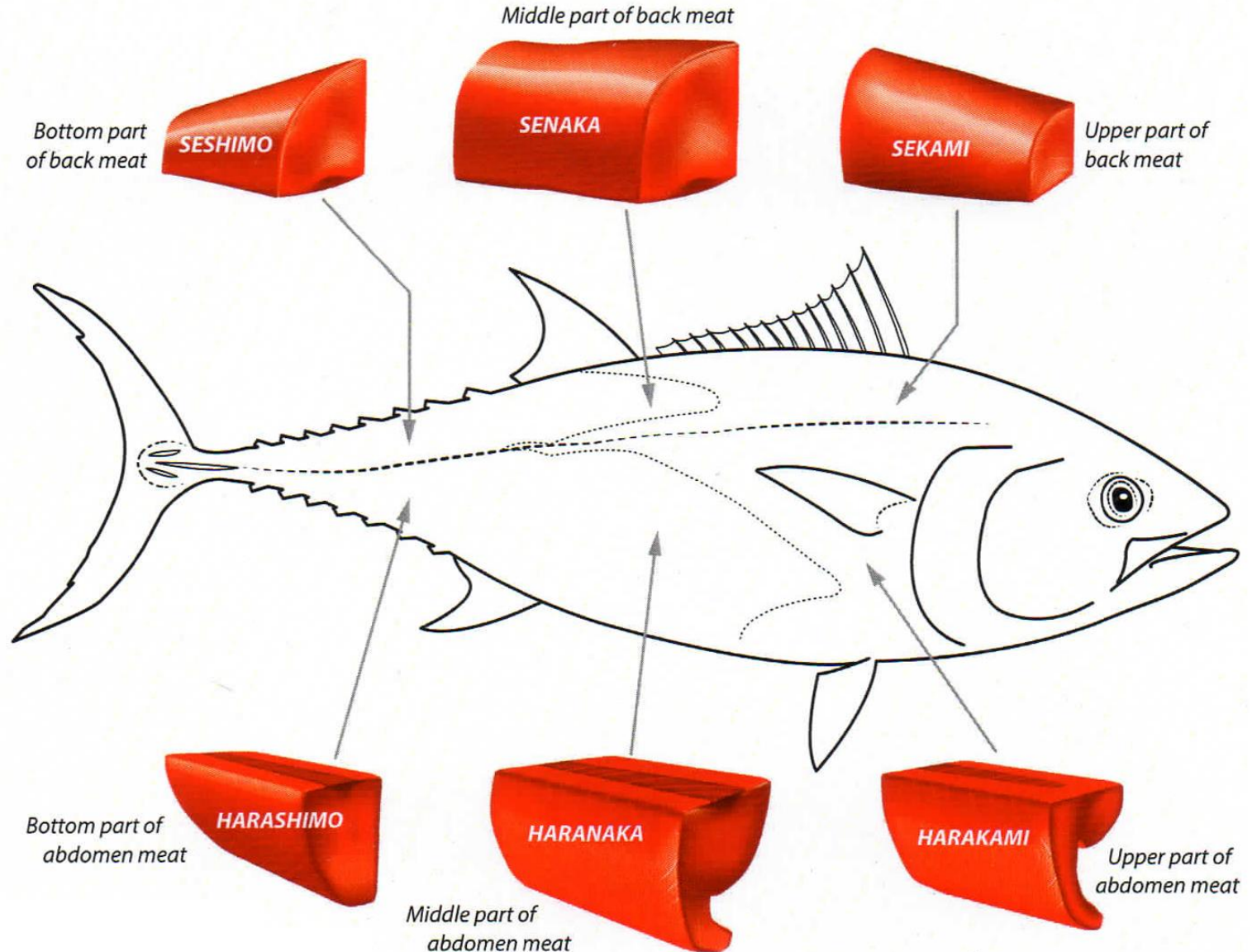
#2



#3



Loin - Sections



Japanese restaurants loins broken down into more specific portion depending how much money they want to spend. Senaka, haranaka and harakami are the most expensive cuts.

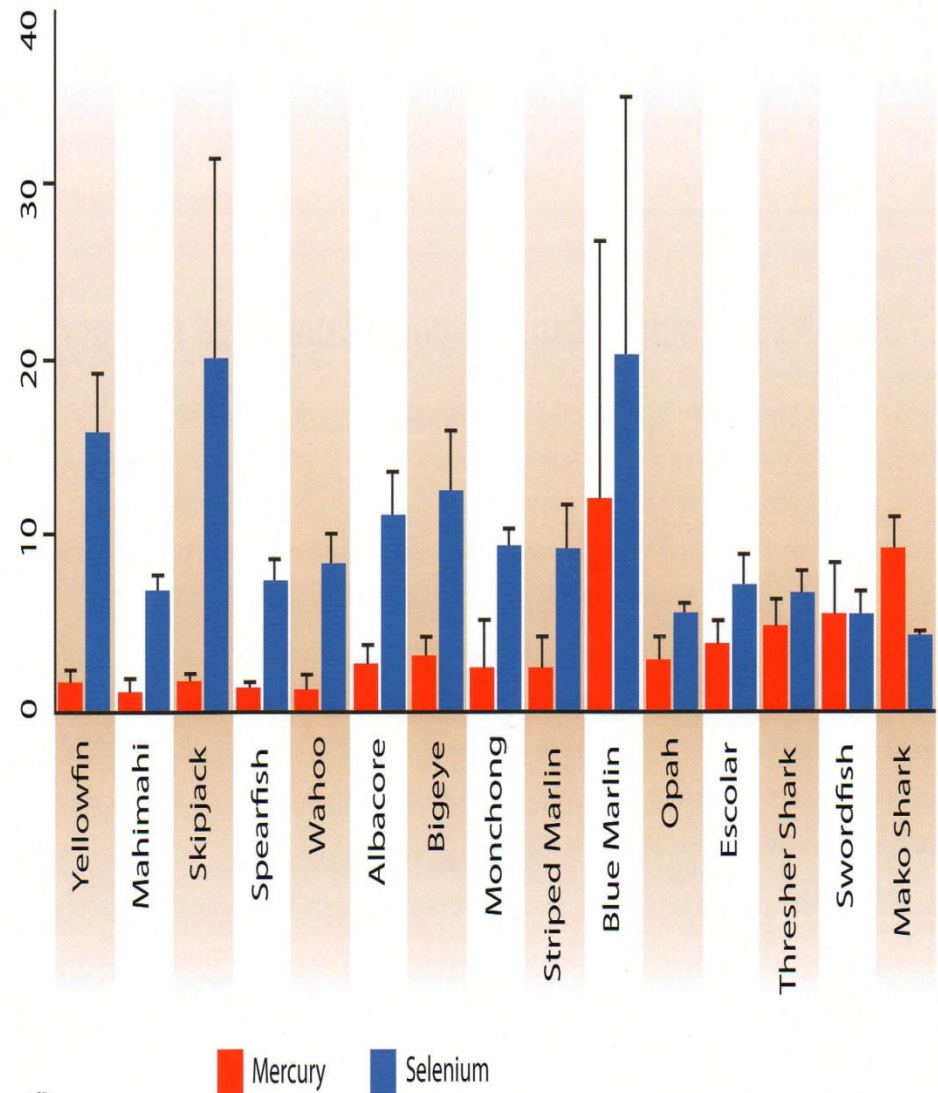
CO (Carbon Monoxide) Treated Loin



Carbon monoxide replace oxygen into the myoglobin and form stable reddish compound carboxymyoglobin which remains red colour for months.

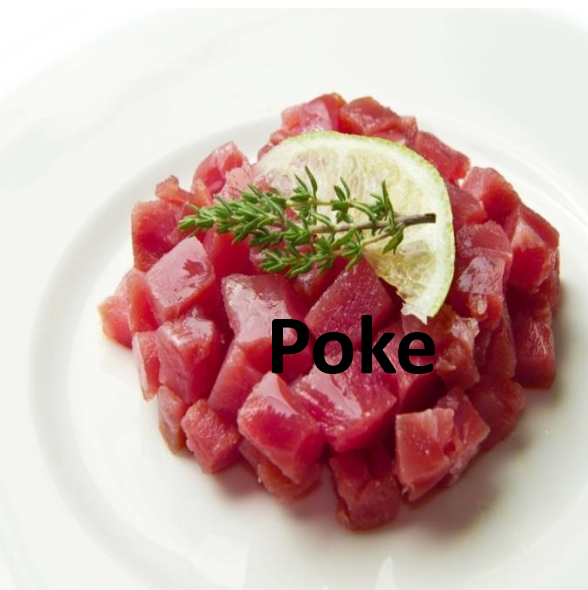
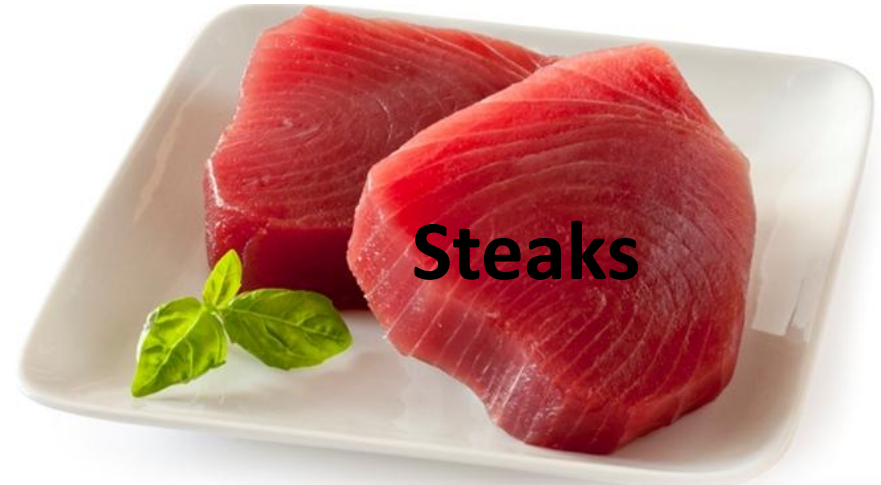
Selenium in Tuna protects against Mercury

Naturally occurring selenium in tuna prevents and reverse adverse effect of mercury. If Selenium level is higher than mercury the fish is safe to eat. Tuna has about 18 times more selenium than mercury.



How Tuna is utilized?

- Consumed as raw forms- Sashimi grade



By-products-Zero wastage



Belly



Tail meat



Dark meat



Chin meat



Eye

- Consumed as cooked form – canned tuna in different liquids, coated products etc.
- The price and utilization of Tuna depending only on quality.
- So quality is more important and not the quantity.
- Handling of Tuna onboard and landing centre are more important because the quality may be lowered in these two places if proper care is not taken.

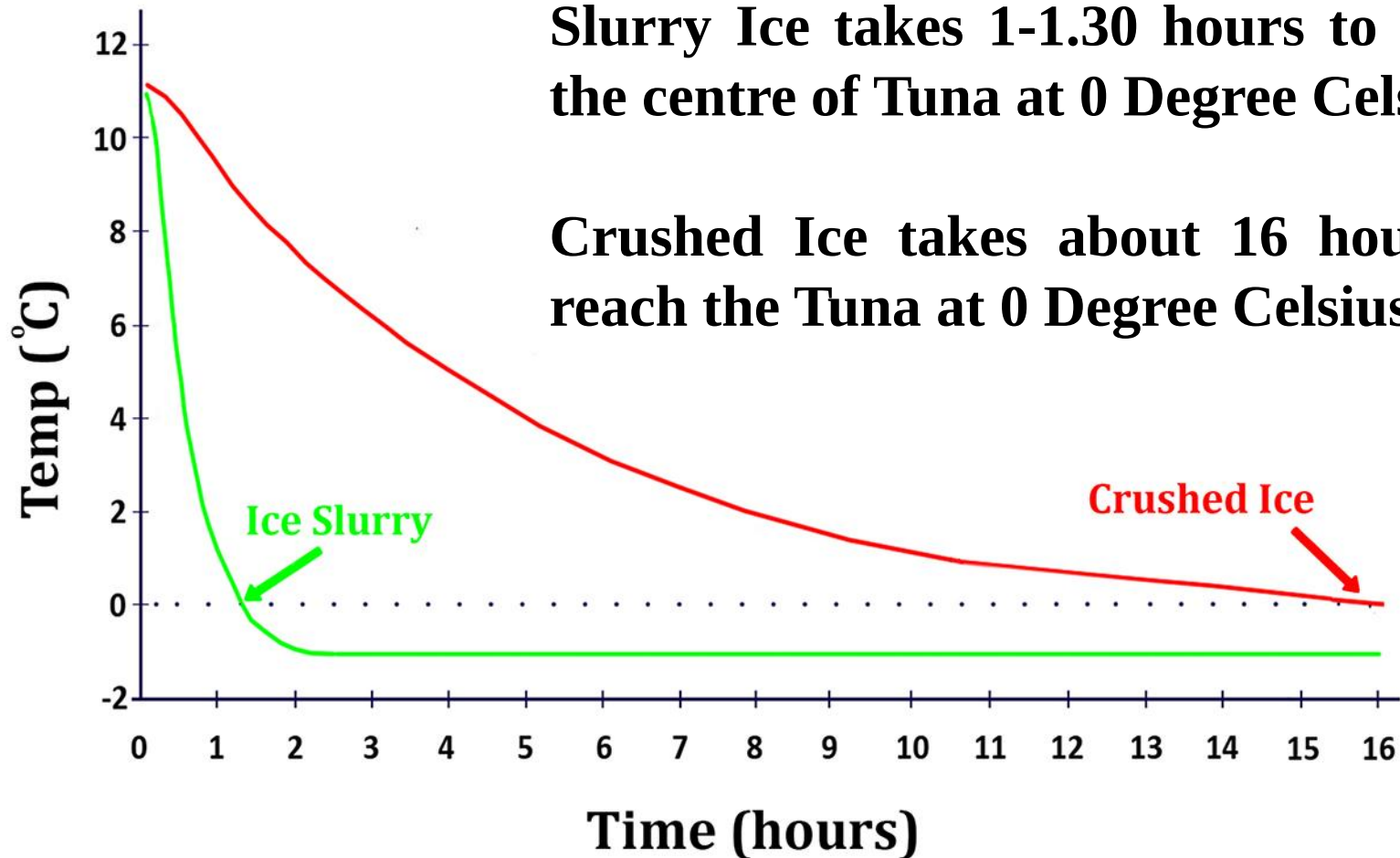
Tuna – Present Indian Scenario

- Fishing is not considered as a good job.
- Fishermen is unaware about raw eating of tuna.
- They are fishing for quantity and not much bothered about quality.
- Gutting, gilling and bleeding are not done onboard and it is generally carried out at landing time.
- They are not aware of the quality standards and steps to be taken to get best quality tuna.
- Chilling in the ice slurry is not done properly.
- They are catching not only tuna but bill fishes also and stored together.
- Proper transportation of raw material and air lifting facilities for products are not sufficient.

Suggestions to achieve Sashimi grade Tuna

- Skill up gradation of the fishermen to aware the importance of quality. They are aware about the international price of the Sashimi grade tuna but least bothered about quality standard.
- Availability of good ice and potable water sufficiently. Introduce mobile ice making unit.
- Introduce GMP in handling the fish in landing centres and transportation.
- More air lifting facility .
- In the landing centre auction may be carried out on boat wise, so that each boat take more care to bring good quality fish.
- Introduce fishing vessel only for tuna fishing.
- Gutting, gilling and bleeding should be done on board itself (as per the standard procedure).
- Ice slurry is to be used for chilling the fish.

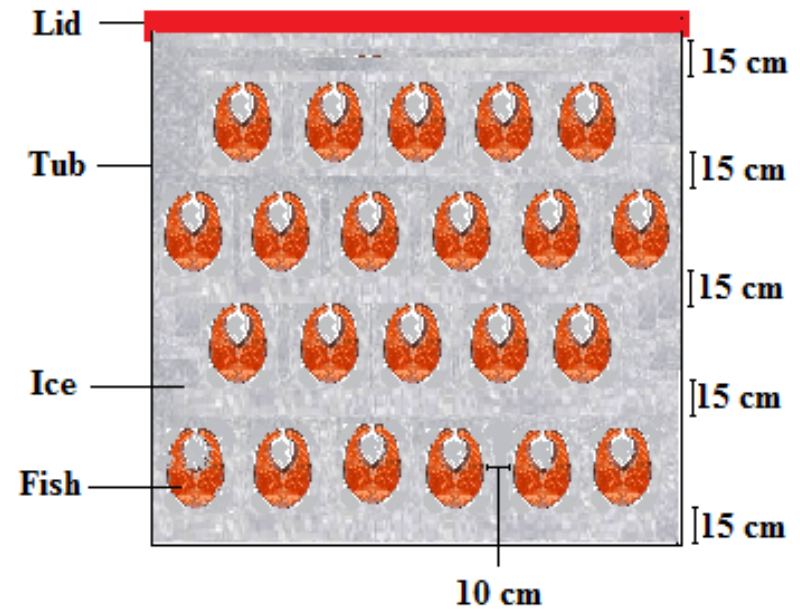
Cooling rates in the centre of Tuna - comparison of Slurry ice and Crushed ice



Slurry Ice takes 1-1.30 hours to reach the centre of Tuna at 0 Degree Celsius.

Crushed Ice takes about 16 hours to reach the Tuna at 0 Degree Celsius.

- Sufficient ice is to be used for storing the fish
- Personal hygiene of fishermen and fish handlers must be improved.
- Intensify long line fishing:-
The temperature of tuna meat is higher than water temperature. Hence the quality of tuna from deep waters is better than surface tuna.



Export of Tuna from India

- Mainly as whole frozen- used for canning – EU, Thailand, Iran etc- 2.1 to 2.5 US\$/kg.
- Frozen loin- also used for canning EU, Vietnam etc- 5 to 5.5 US\$/kg
- Small quantity in chilled form :-
 - (a) GG – Japan and US – 10\$/kg
 - (b) Chilled Loin – EU- 12 to 14 US\$/kg

If by implementing all measures to improve the quality of tuna landings in India of Sashimi grade which will bring maximum foreign exchange that will boost both fisherman and industry.



The End