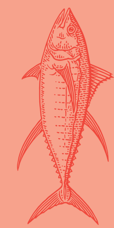

# NOVA SCOTIA SPECIES SPOTLIGHT: YELLOWFIN TUNA (*Thunnus albacares*)

## FISHERY

Yellowfin tuna (YFT) is a target species within the swordfish longline fishery, which takes place from April to December.

Yellowfin tuna in the Atlantic Ocean is a single stock, but Canadian boundaries extend from Georges Bank south of Nova Scotia to the Flemish Cap of Newfoundland.

The total allowable catch (TAC) of YFT is 110,000 t for the entire Atlantic Ocean. In 2020, 74 t were captured in SW Nova Scotia (YF12), and only 1 t captured elsewhere in Canada (YF11).

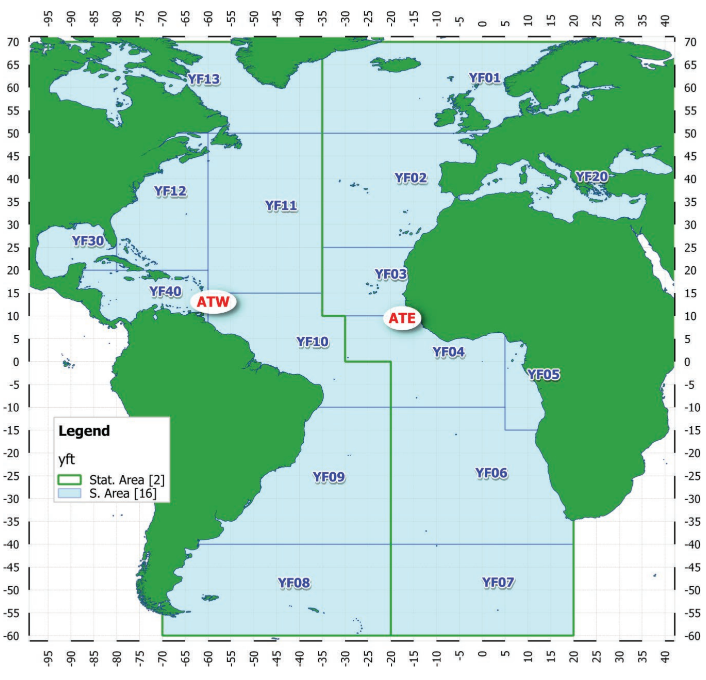


**Figure**. Yellowfin tuna fishing areas in the Atlantic Ocean

## BIOLOGY

Yellowfin is considered a tropical and subtropical species, spending 90% of their time in waters measuring a temperature of 22 °C.

Yellowfin can grow to 239 cm in length and 400 lbs in weight. They have a characteristic yellow colour along the side and a long yellow dorsal fin.

Yellowfin can swim to depths of 350 m, but spend most of their time above 100 m, and with no distinction in depth between day and night.

Yellowfin feed on fish, cephalopods, and crustaceans.

Juvenile YFT (40 – 80 cm) show greater attraction to floating objects than adult YFT and school with other juvenile tunas like skipjack and bigeye.

## LIFE CYCLE

Yellowfin reach sexual maturity within 2 to 3 years of age.

Spawning takes place when water temperatures exceed 24 °C in the Gulf of Mexico from May to August, in the southeastern Caribbean from July to November, and in the central area of the western Atlantic.

Spawning females lay once every 3 days for an average of 46 layings per spawning season, producing from 1 to 4 million eggs each time they spawn. Fecundity, or reproductive potential, is related to their size and age.

Hatched larvae measure 2.7 mm in diameter when laid. Larvae become juveniles after 25 days and measure 46 mm in length.

Yellowfin can live from 8 to 18 years.

## MANAGEMENT AND CONSERVATION

The International Commission for the Conservation of Atlantic Tunas (ICCAT) is an inter-governmental fishery organization responsible for the conservation of tunas and tuna-like species in the Atlantic Ocean and its adjacent seas. Representatives from Fisheries and Oceans Canada, as well as industry associations, participate with other member countries in ICCAT meetings to ensure consistent management measures get adopted. Yellowfin throughout the Atlantic Ocean is managed as a single stock.

Statistical models adopted by ICCAT in 2018 indicated the stock is not overfished and that overfishing is not occurring.

Management measures include gear restrictions, seasonal closures, vessel observer coverage, catch weights and size information reported by an independent dockside monitoring company.

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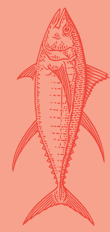
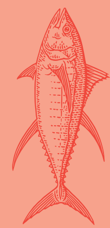


# NOVA SCOTIA SPECIES SPOTLIGHT: **YELLOWFIN TUNA (*Thunnus albacares*)**

## SEAFOOD LABELLING

| | Terminology | Description |
|---|---|---|
| **Common Name** | **English**: Yellowfin Tuna, Yellowfin, Tuna<br>**French**: Albacore | Accepted common name(s) for *Thunnus albacares* |
| **Production Method** | Wild | Harvested from the ocean |
| **Certifications** | Marine Stewardship Council (MSC) | Certifies that fish products come from wild fisheries that meet environmental standards for sustainable fishing |
| **Product Forms** | Round | Unprocessed |
| | Dressed | Eviscerated and head, tail and fins removed |
| | Gutted | Eviscerated and gills removed |
| | Loin | Dorsal (back) or ventral (belly) segment of a tuna fillet |
| **Grading** | #1 | Bright red, great clarity |
| | #2+ | Slight loss of colour or clarity |
| | #2 | Slight loss of colour and clarity |
| | #3 | Dull red, opaque clarity |
| **Process Description** | Superfrozen | Frozen and maintained at temperatures < -60 °C |
| | Ikejime | Brains spiked, metal rod inserted into spinal column, fish bled then flushed with sea water |
| | Sushi-Grade | Previously frozen to below -35 °C for over 15 hrs, or below -20 °C for over 7 days |
| **Sushi Cuts** | Noten | Top of the head |
| | Hoho-niku | Cheek |
| | Kama-toro | Back cheek |
| | Sekami | Upper back-loin segment |
| | Senaka | Middle back-loin segment |
| | Seshimo | Lower back-loin segment |
| | Harakami otoro | Upper belly-loin segment |
| | Haranaka chutoro | Middle belly-loin segment |
| | Harashimo | Lower belly-loin segment |



# NOVA SCOTIA SPECIES SPOTLIGHT: **YELLOWFIN TUNA** (*Thunnus albacares*)

## PROCESSING/HANDLING

### ICCAT Conversion Factor

Round weight = Gilled & Gutted weight * **1.13**

Round weight = Dressed weight * **1.25,** or

Round weight = Dressed weight ***1.1 + 3.698**

### Primary Products
Dressed

### Secondary Products
Loins

### Post-Harvest Primary Processing
Harvest » Slaughter » Bleeding, Evisceration » Vessel Stowage » Off Loading » Head and Tail removal » Grading » Packaging » Storage » Transportation

### By-Product
Heads, Skin, Viscera, Bones, Fins (up to 40% of round fish weight)

### Grading Criteria
Fish Indicators - Appearance, size, and shape
Flesh Indicators - Colour, texture, and fat content

### Post-Harvest Processes Impacting Quality

- Slaughter Technique (Ikejime)
- Delay in Slaughter
- Product Exposure
- Bleeding Practice
- Product Chilling (delay in chilling, temperature abuse)
- Gentle Handling (Gaff punctures and ragged cuts)
- Cleanliness of Gut

## CHEMICAL COMPOSITION

| Proportion (g / 100 g) | | |
|---|---|---|
| | **Raw** | **Cooked** |
| **Moisture** | 74.00 | 69.00 |
| **Protein** | 24.4 | 29.2 |
| **Fat** | 0.49 | 0.59 |
| **Carbohydrate** | 0.00 | 0.00 |
| **Ash** | 1.64 | 1.96 |

*USDA Nutritional Database ID, 15127 (Raw) and 15221 (Cooked)

Yellowfin tuna is considered an intermediate fat content fish. However, fat is not equally deposited throughout the fish, and certain cuts are considered lean, while other fatty. Specifically, toro represents the fatty segments, whereas akami cuts represents the lean segments.

## STORAGE

Chilling should commence as quickly as possible once on board the vessel. A mixture of brine and ice can produce a low temperature slurry capable of accelerating the chilling process over ice alone.

Freezing can extend the shelf life of the product, but tuna remains susceptible to fat oxidation and textural changes over the long term if not adequately protected by packaging.

Frozen storage at -18 °C is effective for maintaining a shelf life for up 6 months, whereas -30 °C is effective for maintaining a shelf life of up to 12 months, for a good quality product. Superfreezing to below -60 °C can greatly extend the shelf life by slowing the onset of textural changes that occur in fish frozen at -18 °C.

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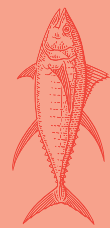

# NOVA SCOTIA SPECIES SPOTLIGHT: YELLOWFIN TUNA (*Thunnus albacares*)

## KEY FOOD SAFETY AND QUALITY CONCERNS

Tunas possess high concentrations of the amino acid histidine within their tissues, and temperature abuses allow microbes found naturally in the marine environment to grow and convert it to histamine. Histamine is a biogenic amine that if consumed leads to an allergic-type reaction called scombroid poisoning.

Yellowfin can bioaccumulate environmental contaminants and a primary hazard is heavy metals. Organic mercury (methylmercury) can accumulate within tuna flesh and limit of 1 ppm is permitted for tunas by Health Canada.

**Tuna flesh quality is assessed primarily by its colour and clarity. The following post-harvest practices influence flesh quality:**

**Ikejime method** – this slaughter technique prevents post-mortem activity in the nervous system that prevents further energy consumption in the muscle. Post-mortem muscle activity consumes additional ATP, and can drive increases of both temperature and lactic acid that overall affect clarity and flavour of the muscle. This method is the most humane method of killing fish, and is prized for sushi because of the quality of flesh that it produces.

**Increasing internal temperature during harvest** – tunas generate heat when their activity increases, and fighting on the line during capture can drive their internal temperatures up to 10 °C greater than the surface water temperature. Both colour and clarity become affected if harvested in this condition.

**Lactic acid build-up in the muscle during harvest** – as tunas fight on the line during capture, they use up available energy within the muscle and begin to produce lactic acid. Lactic acid accumulation reduces muscle pH, and degrades the protein structure of the muscle tissues. Both colour and clarity become affected if harvested in this condition.

**Speed of bleeding** - delays in bleeding will make it more difficult to remove blood particles from the flesh. Slow or incomplete bleeding will affect the clarity.

**Speed of chilling** – chilling is necessary to drive down the internal product temperature. Tuna held longer at elevated temperatures post-harvest will lose colour and clarity more rapidly than if chilled sooner.

**Bleeding** – during the bleeding process, warm blood can interact with cool edible meat leading to damage to the flesh and stimulation of the development of rancidity in fat.

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