

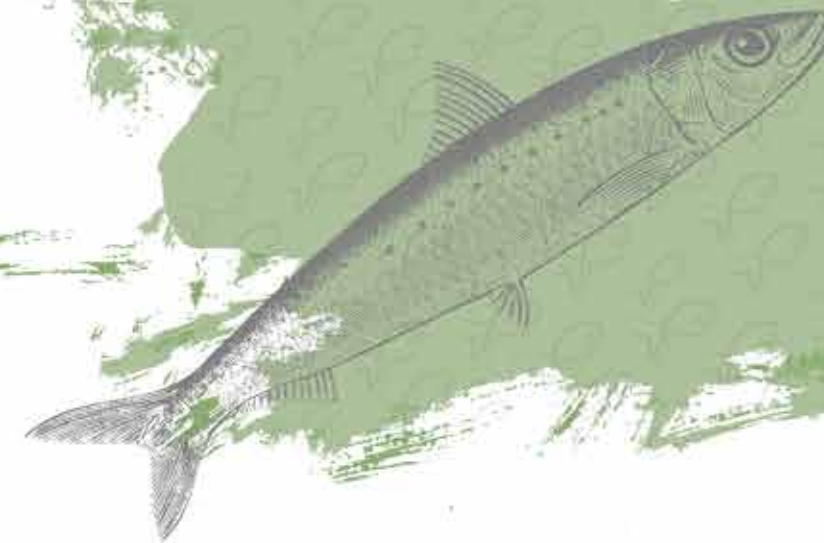
Kingdom of Morocco



Ministry of Agriculture
and Maritime Fisheries

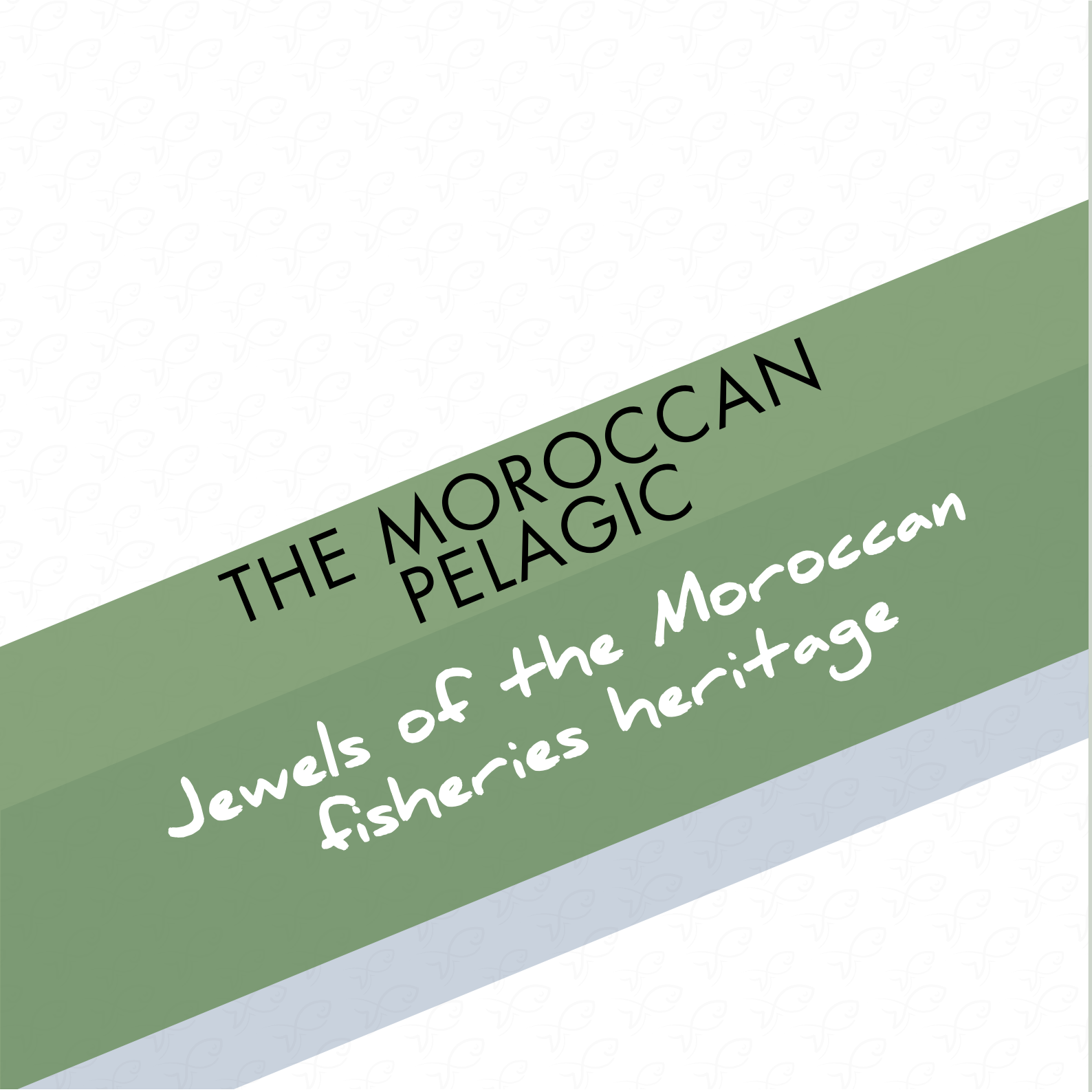
The Moroccan Pelagic

Consumer Brochure



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MOROCCAN SEAFOOD
Naturally



THE MOROCCAN PELAGIC

Jewels of the Moroccan
fisheries heritage



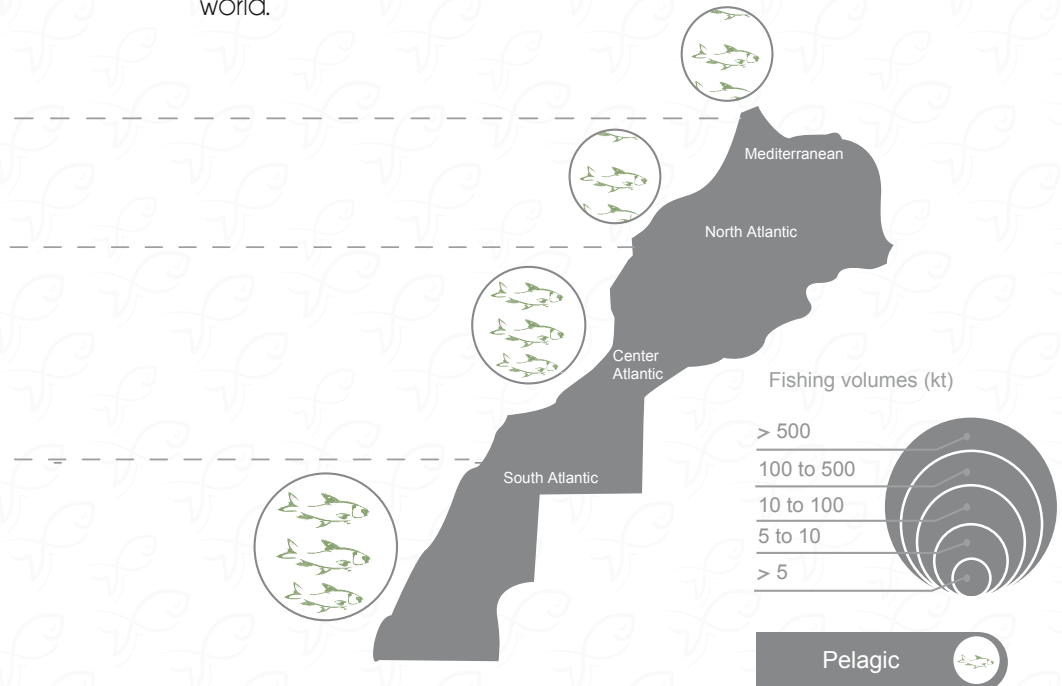




Their major assets : *Abundance and nutritional qualities!*

The position of Morocco is strategic for many reasons: it is the intersection of cold currents coming from the Canary islands combined with the Upwelling, it has more than 3 500 km of coastline providing a rare diversity of marine environments for a wide variety of seafood.

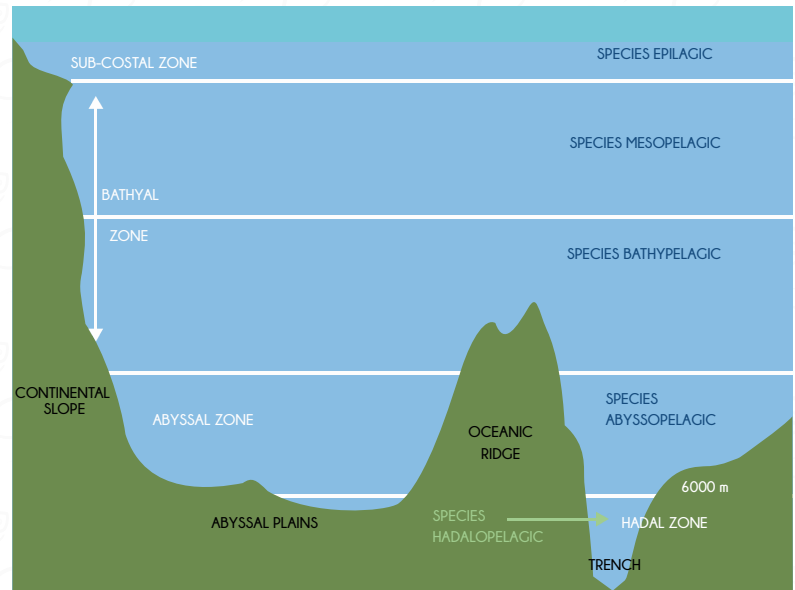
What is the outcome of this outline? It has zones which are among the richest fishing areas in the world, with more than a million square kilometres of exclusive economic zone; this places the Kingdom among the major producers of pelagic fish in the world.



What is pelagic fish?

Pelagic fish are marine species that live between the surface and the seabed or ocean just before the demersal zone.

Depending on the depth, the pelagic zone is divided into several subzones :



- Epipelagic (0 - 200m),
- Bathypelagic (1 000m - 4 000m),
- Hadopelagic (beyond 6000m).
- Mesopelagic (200 - 1 000m),
- Abyssopelagic (4 000m - 6000m),

Pelagic fish can be recognised from some physical characteristics: Pelagic fish are blue-green back and silvery on the belly, these colours help protect birds and marine predators. Their elongated shape allows them to move easily. Most pelagic species are gregarious, which means they live in groups and swim in shoals.



For diverse Pelagic fish, *Diverse fishing techniques*

There are many types of fishing depending on the fishing area and target pelagic fish. Boats and fishing techniques used are adapted to the species sought, to where it lives and to its behaviour.

We distinguish small fishing boats, coastal vessels and offshore vessels. They are classified according to size, the fishing area and the fishing gear used.

The methods and fishing gear used today by Moroccan fishing allow, thanks to their design, to catch fish effectively. These devices are the subject of researches to implement more environmentally friendly fishing methods, more selective techniques against target species and safer working conditions.

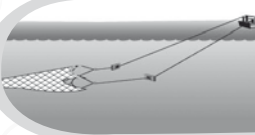
Fishing techniques of this group of fish are purse seines and beach seines, trawls and pelagic gill nets, hand line and fishing line, longlines, lamparos nets and semi-pelagic trawls.



The fishing techniques used targeting pelagics are:



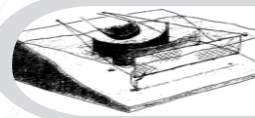
Pelagic trawl : The pelagic trawl is towed net which evolves into the deep water between the surface and bottom, without being in contact with him. As for bottom trawling, there are simple pelagic trawls towed by a single vessel and pair trawls towed by two trawlers. The pelagic trawl is generally much larger than bottom trawling. Its front part is made of simple ropes or very large meshes, which fold schools of fish towards the posterior of the net. The trawl the immersion controls is by means of a sounder at the front of the trawl, the netz sounder.



Semi-pelagic trawl : this type is designed to run a certain distance above the bottom. In comparison with the bottom trawl, the semi-pelagic trawl is characterized by a more or less big part of its rigging which is not in contact with the bottom (fork, panels or bead) so that it becomes sometimes possible to pass the trawl slightly above the bottom.



Gill net : The right gill net is a rectangular fishing net propped vertically in water. floats are attached to the upper part. the lower part is weighted to maintain the threads in vertical position.



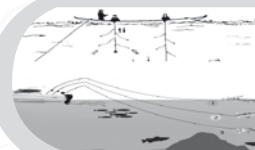
Beach seine : This is a vertical net, rectangular wet arc by a boat starting from the shore to return to after bypassing the shoal. The seine shore hauling is done using two long arms.



Purse seine : taking the shape of a rectangular net, aimed to surround a fish shoal, and locked at its base by a strap. Thus, the fish is trapped inside the net which takes a cylindric then conic shape. The fish is dragged onboard thanks to a landing net called brailier.



Longline : This is a long line which comprises a main line on which are fixed numerous hooks through branch lines of variable length and spacing depending on the species sought and type of long lining.



Lines :

Handheld : Generally in monofilament and is held directly by hand, weighted at the bottom and used for fishing close to the bottom or mid-water: mounted on one or two canes.

Trolling : Simple line provided with natural or artificial bait (lure) and dragged by a boat near the surface or at a certain depth.



Trap : fixed gear anchored to the bottom usually containing a guide net that leads bluefin tuna in an enclosure or series of enclosures where they are kept until they are killed.



Pelagic fish, a sustainable resource

The policy of preserving the pelagic fish resource relies on several plans:

Development plan for small pelagic

To ensure their sustainable use, development plans of small pelagic were developed on the basis of biological, environmental, technical and socio-economic. The objectives of these plans are the preservation of this resource through rational exploitation of this fishery and increased its valuation. The Management Plan for small pelagic fisheries concerns three: the fishery in the North-Mediterranean fishery Atlantic Centre and the fishery in the South Atlantic.

Tuna fishing management plan

The development plan of the tuna fishery aims at a sustainable, fair and responsible exploitation of this species, and is part of Morocco's commitments with respect to the provisions of the International Commission for the Conservation of Atlantic Tunas Atlantic (ICCAT). Morocco is a must for bluefin tuna, due to its Atlantic spawning migration to the Mediterranean (spawning) and its return from the Mediterranean to the Atlantic (trophic migration). This plan reinforces the application tracking system of national and international management measures (ICCAT).

Swordfish management plan

The swordfish in the Mediterranean and Atlantic Management Plan defines management measures to comply with Morocco's commitments with respect to the International Commission for the Conservation of Atlantic Tunas (ICCAT) and guarantees maximizing socio-economic benefits from the exploitation of this resource.

Shark fishing conservation plan

The management plan for the fishery of sharks aims the preservation of these species. The established management measures concern the conservation and management of these shark species, monitoring of fishing activities of vessels targeting these species and the establishment of commercial traceability of liver oil and shark fins.

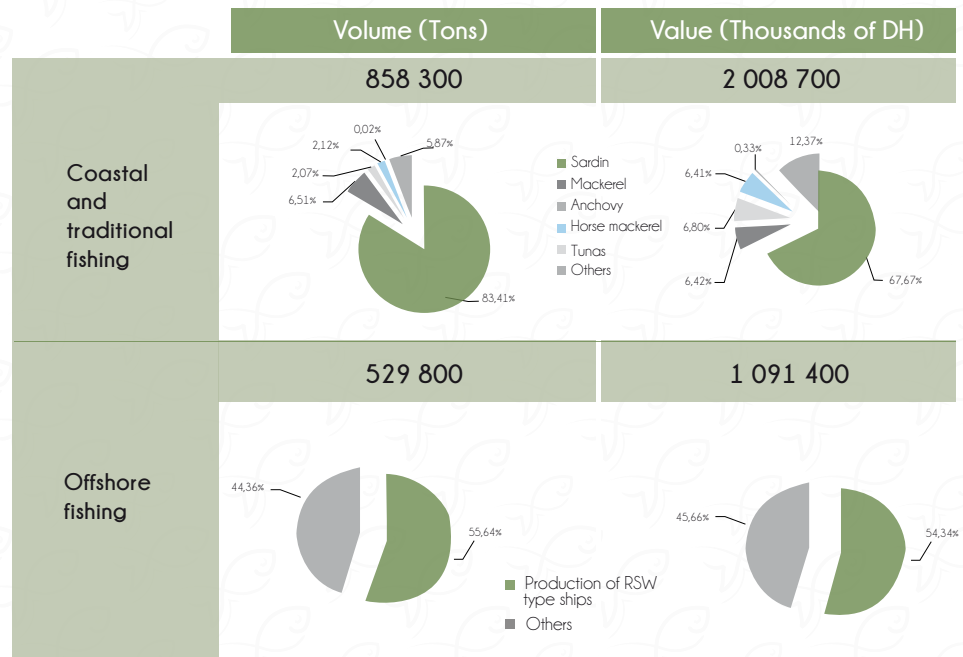




A worldwide recognised production

Morocco is honourably well ranked among the main producers of pelagic fish in the world.

The production of this fish species is 1.4 million tons, or close to 3.10 billion dirhams distributed as follows:





Pelagic fish valued in the Moroccan way

The amount of pelagic fish represents over 84% of national production. Once these fish are shipped, they are routed to the local market to be consumed fresh, or to the seafood upgrading units to meet the consumer demand for sophisticated products. Moroccan pelagic fish are either canned or semi-preserved with different types of preparation (natural or seasoned with oil, tomato sauce, whole, net, etc ...) or frozen (whole, EEA, in net, ...) or packaged fresh. The commodity development industry of the Moroccan sea has built a world class reputation that has ranked Morocco among the major exporters in the seafood sector. This is why the kingdom is the world's largest exporter of sardines, including the *Sardina pilchardus* (Walbaum, 1792) species, internationally known and recognized.

The pelagic processing units, approved by the Department of Marine Fisheries, integrate the HACCP system in their manufacturing process. These units adopt standardized practices that ensure quality in accordance with the specifications of their clients. They ensure maximum value from the fishing of pelagic to ensure high quality products. The sub pelagic products are processed into protein flour, oil that can be used as fertilizer but also as food supplements for humans and animals.

Whether processed either at sea aboard ships transformers or in shore plants, the Moroccan pelagic are found in diverse preparations to get out of very varied finished products and quality.



Moroccan pelagic, health asset!

Moroccan pelagic is a traditional fish in Moroccan fishing, that has been delighting blue fish lovers. It has a very fine taste and a texture that is both firm and soft, and is very appreciated by gourmets.

When consumed fresh, its fine and soft flesh has a specific delectable taste. And when canned, it is used in various and appreciated preparations.



... Full of nutriments


























Moroccan pelagic fish are rich in omega 3, they are also generously endowed with minerals and trace elements, such as calcium, selenium, phosphorus, iron and iodine. They are also rich in vitamins and, of course, proteins which have a high nutritional value.

... Low calorie intake

If seafood products are so appreciated on our plates, it's because they are good for their low calories. Moroccan pelagic are no exception to this rule and are therefore excellent for the health of consumers. They provide omega 3 that participate in the prevention of cardiovascular disease, development of walls that surround our cells and facilitate their presence by transmitting signals between the inside and outside of the cell. They also play a central role in many biochemical processes in the body, including the regulation of blood pressure, the elasticity of the vessels, immune responses and anti-inflammatory, and blood platelet aggregation. Also, an intake of Omega 3 contributes to the welfare of the arteries and brain function. Finally, the fatty acids have an important anti-aging role.

Land of a thousand *and one pelagic*

Sardine, Anchovy, Mackerel, Tuna, Swordfish, ... in their highly protected marine environment of the 3 500 km of coasts of Morocco, those that are called the "pelagic" express both authenticity and typicality and are a very important resource, almost startling in its scope. Hence being the major resource for the Moroccan fisheries.

 Sardine : <i>Sardina pilchardus</i>	 European anchovy : <i>Engraulis encrasicolus</i>	 Atlantic mackerel : <i>Scomber scombrus</i>	 Chub mackerel : <i>Scomber colias</i>
 Round sardinella : <i>Sardinella aurita</i>	 Atlantic horse mackerel : <i>Trachurus trachurus</i>	 Sandbar shark : <i>Carcharhinus plumbeus</i>	 Thresher : <i>Alopias vulpinus</i>
 Blue shark : <i>Prionace glauca</i>	 Smooth hammerhead : <i>Sphyrna zygaena</i>	 Greater amberjack : <i>Seriola dumerili</i>	 Flathead grey mullet : <i>Mugil cephalus</i>
 Thicklip grey mullet : <i>Chelon labrosus</i>	 Thinlip grey mullet : <i>Liza ramada</i>	 Bullet tuna : <i>Auxis rochei</i>	 Atlantic Bonito : <i>Sarda sarda</i>
 Skipjack tuna : <i>Katsuwonus pelamis</i>	 Swordfish : <i>Xiphias gladius</i>	 Atlantic bluefin tuna : <i>Thunnus thynnus</i>	 Bigeye tuna : <i>Thunnus obesus</i>
 Albacore : <i>Thunnus alalunga</i>	 Yellowfin tuna : <i>Thunnus albacares</i>	 Largehead hairtai : <i>Trichiurus lepturus</i>	 Silver scabbardfish : <i>Lepidopus caudatus</i>
 Black scabbardfish : <i>Aphanopus carbo</i>			



Zoom on majestic pelagic fish

Let's discover Moroccan emblematic species that combine exceptional nutritional and dietary flavours.



Sardine : *Sardina pilchardus*

With a silver and slender body along with white belly, this small pelagic size varies from 15 to 20cm.

Sardine is a gregarious fish that form large shoals near shore, not really deep, around 15 to 55m deep. Moroccan sardine is the true sardine, "Sardina pilchardus" that is now internationally recognized and whose name "true sardine" is protected by international regulations.

The health side : This is one of the best sources of omega 3 rich in interesting micro nutrients for health: calcium, selenium, phosphorus, vitamin D and group B.

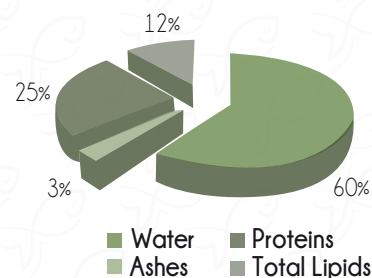
The practical side :

Fresh means. . .	Minimal commercial size
Bright colours - Dark back and clear and shiny belly Firm body and soft and elastic flesh- Clear and transparent eye	From 30 to 45 units / Kg

The nutritional side :

For 100g of Sardine

Energy intake : 208 Kcal



European anchovy : *Engraulis encrasicolus*

Locally called Lanchouba, anchovy has an elongated and slender body. The back is blue-green, flank and belly are silver and blue gray stripe sometimes extends between the back and flanks. Anchovy fish lives in shoals in waters not really deep. Its behaviour is similar to that of the sardine.

The health side : real "health-food" widely provided in Omega 3, minerals and trace elements, the Moroccan anchovy provides valuable vitamins non-negligible quantity, and protein of a high nutritional value.

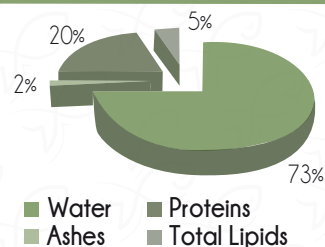
The practical side :

Fresh means. . .	Minimal commercial size
Well toned body - Smooth texture, free of slime on the surface - Eyes shining, clear and convex and non-scrambled. - Dark colour - Fresh scent reminiscent of the sea - It should not be unpleasant.	60 units / kg

The nutritional side :

For 100g of Anchovy

Energy intake : 131 Kcal





Chub mackerel : *Scomber colias*

Locally called Kabaila, mackerel is distinguished by a streaked body, blue stripes and a white belly. It has a common size of 18 to 30cm.

This species is gregarious and form shoals of fish of the same size. It is "epipelagic" or "meso-demersal" (demersal means fish living near bottoms): it lives indeed in deep waters in winter and near the coast in the spring.

The health side : Highly valued for its flesh, the Moroccan mackerel is rich in B vitamins and vitamin D, as well as in several minerals such as selenium, iron and iodine; it is also, of course, a source of omega-3 fatty acids.

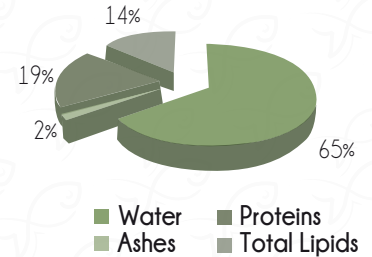
The practical side :

Fresh means...	Minimal commercial size
Rigid body - Smooth texture, free of slime on the surface - Bright and frank eyes - Bright color - Skin with metallic reflections - Bulging belly and white - Nice fresh smell.	20 units / kg

The nutritional side :

For 100g of Mackerel

Energy intake : 205 Kcal



Atlantic bluefin tuna : *Thunnus thynnus*

Large pelagic fish characterized by the red colour of its flesh. This is one the largest species of tuna. It has a common length of 50 to 1.50m, but can grow up to 3m; its weight in adulthood is of the order of 400 kg.

Bluefin tuna is a spike and mesopelagic species. Young tuna are held in warm waters, adults penetrate into cold water to feed.

The health side : Less fat than is generally believed, low in calories, Moroccan bluefin tuna contains the famous Omega 3 which play an important role in preventing cardiovascular disease and some cancers.

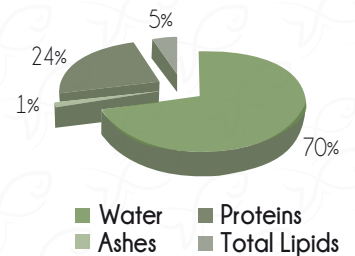
The practical side :

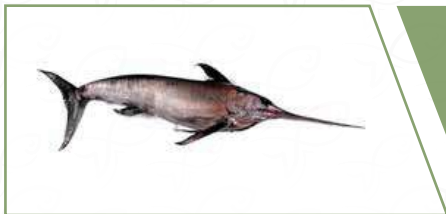
Fresh means...	Minimal commercial size
Slight smell of cucumber and, above all, never feel ammonia - Red flesh, firm and compact - Soft texture showing no signs of drying out.	30 units / kg

The nutritional side :

For 100g of Bluefin Tuna

Energy intake : 144 Kcal





Swordfish : *Xiphias gladius*

It is a large pelagic, highly migratory, remarkable for its large flattened rostrum. In adulthood, it can weigh hundreds of kilos and measure over 4m50, its common size is 80cm to 3m50. The swordfish is an oceanic species, spike and mesopelagic, of 0 to 800m depth. It usually lives alone, but sometimes in small groups. It migrates between temperate and cold waters (nursery areas) and hot water (spawning areas).

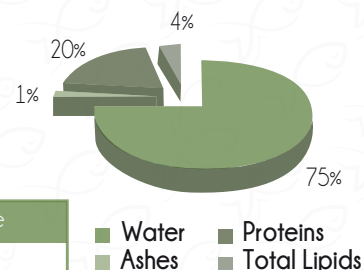
The health side : Moroccan swordfish, low in calories, is a rich source of minerals such as phosphorus, iron, potassium and phosphorus, and various vitamins, especially B12, B6.

The practical side :

Fresh means...	Minimal commercial size
Very shiny skin - Firm and clear flesh - Smooth and slightly moist texture - Body without stain and without injury - Bright color.	From 90 to 125cm / unit

The nutritional side :

For 100g of Swordfish
Energy intake : 121 Kcal



For an optimal *freshness and quality*

We have to take some measures in order keep the taste and nutritive characteristics of the pelagic fish, as well as its edibility, and to avoid the risk of being intoxicated.

At the fish store...

We must respect scrupulously :

- Good practices for presentation and sale of seafood,
- The conditions of hygiene and safety of pelagic fish,
- The optimum temperature for preservation of a fresh seafood product (between 0 and 2 ° C).

You always end your shopping with the fish.

Roll it in plastic wrap or better pack the vacuum.

Put it down to the refrigerator, above the vegetable crisper.

You put your pelagic immediately (whole, net, ...) in a portable cooler.

You quickly get home, you go out of the pelagic purse and you pat dry well with paper towels.

In the fridge ...

- The temperature of domestic refrigerators is at best at 4 degrees.
- The optimal duration of conservation of pelagic fish purchased at the fish store from is 48 in domestic fridge.



Choose the best, *and enjoy it fast*

You understood. Enjoying the fresh pelagic fully requires:

- Buy quality fresh fish,
- Follow the cold chain,
- Pack it well,
- Consume the product the same day, or at the latest 48 hours after your purchase it.

Taste all kinds *of pelagic fish!*

The Moroccan pelagic is valued in various forms; Frozen, canned and semi-preserved, and even in various preparations, marinated, natural, with oil, with vegetables, with olives, ..

These products allow pelagic to be conserved for a longer period, and preserves almost all their nutritional qualities.

The temperature used to put the pelagic in cans does not alter, or just a little, the levels of omega-3, for against it alters the taste, texture and reduces the levels of vitamins and minerals.

Freezing does not affect the protein content of pelagic fish. The set of vitamins and minerals is well preserved. Certainly the omega 3 fats might alter but the loss remains fairly low. Thus, following the freezing conditions related to the effectiveness of the cold chain and optimum shelf life, frozen pelagic retains the same nutritional value as fresh. Defrosting should not be done in the open, but in the microwave or refrigerator. As for all other frozen foods, it is strictly prohibited to refreeze defrosted pelagic fish

So, whether fresh, frozen or canned, have the Moroccan pelagic in your plate.





