REGIONE DEL VENETO
ULSS4 VENETO ORIENTALE

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FISH:

GETTING THE BEST NUTRITIONAL VALUES FROM FISH PRODUCTS

Food Safety is very important for the consumer, and moreover, it is one of the main E.U. targets. Our mean is to give the consumer the best advice on safe food consumption, starting with fish products.

fish is divided into different categories:

Fish: bone-fish (cod, sole, sea-bass), selachian or cartilage fish (smooth hound, ray)
Molluscs: bivalves (mussel, oyster, clam), cephalopods (squid, eledone, octopous, cuttlefish) and
Gastropods : (murex);
Crustacean: grenadier (craw-fish, European lobster, mantis shrimp) and brachyuran (Crab, Spider Crab)
Echinoderms: (sea urchin);
Urochordates: (sea egg/ascidians).

fish

how to recognize fresh fish

It isn't difficult to recognize fresh fish! Look and observe the fish before buying. When it reaches the market counters, fish gives some "easy to guess" signs. Sea fish, for example, should have that particular "sea smell". The body must be stiff (or curved); the constituency should be compact and elastic and the fish-scale should be very sticky. Prominent shiny eyes with black pupils and transparent corneas are other signs of freshness.

a quick guide to identify fresh fish

	FRESH FISH	***FISH NOT FRESH***
smell	*Light, pleasant, marine (for sea and lagoon fish)*	*Pungent, unpleasant*
general appearance	*Bright, metallic, rainbow like*	*Pale, no reflex*
body	*Stiff (or curved)*	*Soft*
scales	*Sticky and hard to remove*	*Not sticky*
skin	*Bright, gaudy colours*	*Dull colours*
eyes	*Prominent, black pupils, transparent corneas*	*Deep-set, milky coloured corneas, grey pupils*
gills	*Rosy or bloody red, no Mucilage*	*Yellowish, milky appearance*
meats	*Compact, elastic*	*Soft, crumbly, with yellowish border (in the fillet)*
ribs and backbone	*Sticky to the abdominal wall and dorsal muscles*	*Not sticky*

how to preserve

Fish is an easy-perishable food, in other words, it must be eaten (or frozen) as soon as possible. Once purchased it must be eviscerated and washed in cold, running drinkable water. Then it must be placed immediately in the fridge, on a dish covered with cling film (for foodstuffs) or aluminium foil to avoid spreading smells and contact with other food. Only fresh fish can be frozen. Packing fish for freezing must be accurately done and put into airproof (well-sealed) plastic bags for freezing (such as polyethylene bags): The fish should be washed and cleaned, cutting off fins and prominent pieces, put into the appropriate freezer bags (making sure there is no air in the bag), and placed in a freezer at a temperature of -18°. Freezer bags are easily obtainable at most supermarkets. Preserving time differs according to the fat contents in the different species:

- **fatless fish can be kept frozen for more than 6 months.**
- **fat fish is recommended to be kept frozen no longer than 3 months.**

It's useful to apply labels on the packages to show the freezing date. As we know, fish is at its best when it is consumed fresh as the nutritional benefits are not altered as are in some preserving methods. Because of this many preserving methods have been altered to avoid perishing, e.g.:

- Salting: enriching fish with high salt amounts makes it unsuitable for persons who suffer from diseases such as Hypertension, but can be desalted before consuming.
- Exsiccation: natural or artificial; suitable for preserving fatless fish like Cod that becomes Stockfish.
- Smoked: method mostly used for flavouring rather than preserving.
- Freezing or deep-freezing: preserving method which enables you to maintain excellent organoleptic qualities especially if the product is fatless.
- Tinned: this method can preserve the product for years, with the addition of oil or saline solutions.

consuming raw fish

For many years raw fish consumption has been appreciated not only in restaurants (Sushi, Sashimi). Food Safety Health rules specify that fish products (except bivalves and molluscs) suitable for eating raw, must be previously frozen at a temperature no more than -20° for at least 24 hours. If this is not possible, we recommend cooking the product before eating it.

mollusks

bivalves

Bivalves (scallops, capasantas, mussels, clams, oysters, venus clams) must be living and vital when purchased, but this does not mean a proper health warranty.

For the consumers safeguard, some health rules have been established which state, in addition to the "water classification**"** where the fish live, as well as the "depurative duties**"** in specific centre's, supplied with clean sea water. Moreover the rules specifically state that the product must be packed and sealed in tough tins. The product certification starts from the very beginning till it reaches the consumer. The package, inside the plastic netting, must be provided with a label indicating the trademark which certifies the origin**,** the species, product identification centre and the package date. The expiry date is replaced by the words: **"Mollusks must be living and vital at the time of purchase"**.

We recommend buying molluscs in the package and not by weight, and to handle the bag with care to avoid breaking the valves and the fluid leaking out. If the product is not eaten soon after purchase, it's better to cover the dish with a wet rag and place it in the refrigerator.

Before eating molluscs (venus clams and razor clams) coming from sandy depths, it is better to steep them in salty water, changing the water from time to time, until all sand is removed. The Health rules state that bivalves should be cooked rather than eaten raw. Once cooked and removed from their shells, they can be frozen in their own cooking liquid in specific tins.

cephalopodes and gastropods

Cephalopods (cuttlefish, squid, octopus) and Gastropods (seaslugs, murex) are less exposed to bacterial pollution than bivalves because their nutrition isn't linked to sea water filtration. The fishing and trading of Gastropods follow the same regulations as bivalves (except for the arrangements related to depuration) ensuring quality and proper measures taken from the catching till the time of purchase.

crustaceans

Crustaceans are divided into two families: **Grenadiers**, with a long and outstretched abdomen, ending with an enlarged fan-tail (craw-fish, European lobsters, prawns) and **Brachyurans,** with a short, enlarged abdomen, bended under the carapace; without the fan-tail (crab, spider crab). Crustaceans have a tendency to blacken rapidly due to oxidation reactions. The product itself remains hygienically good, even if the appearance is considerably damaged.
Strangely enough, almost all crustaceans contain a molecule (astraxantine) in the shell, that as in living animals, is associated with a protein, and gives the shell a dark colour. During cooking this molecule is dismantled and becomes its proper natural colour, red. Crustaceans can be preserved for a short time in a humid environment at 0°, like fish. As soon as crustaceans die (specially craw-fish, lobsters and mantis shrimps) a very fast decomposition process begins, due to the micro-organisms action, which is why it is recommended to buy them alive and keep them alive until cooking time. They must move if you touch their eyes and antennas. The strongest crustaceans can be preserved for no more than 3 days. The most frequently used method by industries for short time preserving is freezing. It is always better to turn the temperature down to -25° as the protein in fish is easily perishable and the flesh quickly becomes dry. In this way, the preserving can be lengthened to 12-15 months, usually foodstuffs with a low calorie content. Crustaceans can cause food allergies, which is an important thing to remember!

testing product freshness		
freshness	***testing traits***	***alteration***
bright black	***eyes***	*faded and dull*
stiff	***muscles***	*relaxed*
strong and bright	***thoracic-abdominal membrane***	*relaxed, dull and greenish*
vivid, brilliant	***colour***	*dull*
slightly or nothing	***smell***	*bad*

echinoderms

Echinoderms are only sea-organisms. The main characteristic, from which the term stems, is a calcareous exoskeleton furnished of tubercles and quills. Among the eatable species present in our seas is Sea Urchin. Moreover the echinoderm catching and trading follow the same regulations as bivalves (except for the arrangements related to depuration) which ensures the quality and the proper measures taken from catching till the time of purchase.

tunicates

Tunicates are sessile sea-organisms with the body covered , as the term suggests, with a complex tunic. Among the eatable species is the sea-egg/Ascidia. The catching and trading of Tunicates follow the same regulations as bivalves (except for the arrangements related to depuration) which ensures the quality and the proper measures taken from catching till the time of purchase.

water culture products

For quite a few years in Italy, nearly all the counters near the caught fish section, sell freshwater fish too. In fact this enables us to find the answer to the needs of trade and safeguard our sea resources. There's the distinction between a kind of intensive breeding which is practiced in the "Valli da Pesca" in Venice and Caorle lagoons, where human activity becomes important especially as far the supply of nourishment is concerned - chosen with care for their digestibility - to breed species. So water culture is able to guarantee safe and controlled products regarding the nutritional values; the water cultured fish (freshwater fish) have the same quantity and quality protein as caught fish.

more information for the consumer

For many years we have been getting more information about what to buy, thanks to an E.U. rule stating the specific labelling for traded fish products. The retailers -in particular supermarkets, fish-shops- have the duty to show the label on every kind of product, which must give important information: e.g.:

- trade denomination of the species

• productive method
• fishing zone

The productive method indicates if the fish comes from breeding centre's or if it has been caught; the fishing zone indicates the country of breeding or the fishing place, either national fish or fish coming from EU countries and non-EU countries.

why do we need to eat fish?

The Direction Line for an Italian safe nutrition (INRAN 2003) suggests that we eat at least 2-3 weekly portions of fish because of the high content of proteins and polyunsaturated fats. Fish contains a variable quantity of proteins from 15 to 19% with a high biologic function, for the presence of essential aminoacids like Histidine (essential for children) and lysine. Fish is poor in connective tissue, therefore it is more digestible and lighter than meat. Fish is rich in Vitamins A and D (**fat-soluble vitamins)** particularly present in the liver. It is rich in vitamin B group (**water-soluble** vitamins) especially **Niacine (pp).** Fish brings precious **minerals** to the human body such as **Iodine**, (especially present in sea fish), **Phosphorus**, **Iron**, **Fluorine**, **Potassium** and **Copper**. **Calcium** is present in the skeleton and unfortunately is lost during cleaning procedures (except for the small fish which is entirely eaten). The fats in fish are mostly formed by unsaturated fat acids (mono and polyunsaturated essential fat acids. Fish contains particular **fat acids - omega 3 series** (EPA and DHA) - especially indicated in preventing cardiovascular diseases. The cholesterol absorption is low (except for their eggs). They are divided into groups according to the fat content:

• F**at-less fish** (including molluscs and crustaceans): fat 1-3% (anchovies, squids, crayfish, cod, mussels, sea breams, hakes, smooth hound, octopus, turbots, cuttlefish, sole, sea bass, trout).
• **Semi-fatted fish:** fat 3-8% (carp, dentex, grey mullet, sardines, mullet)
• **Fat fish:** fats over 8% (eel, herring, salmon, tuna-fish, mackerel).

Molluscs (mussels, clams and octopus) and crustaceans (crayfish, prawns) have a similar composition to sea fish, with less proteins, but a good Zinc, Magnesium and iodine content; Iron is also present in mussels, clams and oysters.

helpful information
mercury

How does it form?
A metal released in the environment by human and natural activities (washing waters on rocks rich in mercury, submarine volcanic eruptions) converted by bacteria in the organic methylmercury form.
Which fish are the most easily involved in this process?
Big fish, denominated "by slices", such as: sword-fish, shark, tuna-fish.
And if the product has been cooked?
Methylmercury does not dissolve with heat.
What should we do to prevent it?
The methylmercury assimilation is lower than risk levels. However, as methylmercury is a mineral which is not eliminated by the human body, we recommend a limited intake of big fish - which contains a bigger mercury content (shark, sword-fish, tuna)- to a single weekly portion, especially for pregnant women, during breast feeding and for children.

istamine

How does it form?
The formation in fresh products is caused by the bacterial proliferation given from bad fish preservation, associated with the loss in the freezing cycle, converting an amino-acid, Istidine, into Istamine. This substance can cause skin irritation, vomit, diarrhoea and sometimes dyspnoea and hypotension.
Which fish are the most easily involved?
Anchovies, sardines, tuna, mackerel.
And if the product has been cooked?
Bacteria die but Istamine is not eliminated.
What should we do to prevent it?
Purchasing fresh products, possibly freshly caught and assuring a proper preservation.