



SEAFOOD VALUE IN EVERYDAY MENU

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Seafood importance



- ❖ Seafood is an essential part of our everyday menu.
- ❖ Several populations in the world historically prefer seafood to other foods.
- ❖ The countries in which seafood is the main part of the daily menu, have higher life expectancy figures (Japan, Norway).



Seafood: nutritional value



Balanced chemical composition which is different from the protein of warm-blooded animals;

- ✿ Contains few coarse connective tissue; high-grade proteins prevail;
- ✿ Better digested by digestive enzymes (2,5-3 hours);
- ✿ Have higher assimilation degree (95-98%);
- ✿ Polyunsaturated fatty acids Omega-3 help to reduce LDL cholesterol in the blood, have anti-inflammatory effect, suppressing the formation of malignant cells.



Features of the chemical composition of marine invertebrates



- A source of complete protein (18-20%);
- Carbohydrate content is less than 1%, except for the mussels (1.9%) and oysters (4.7%);
- Low fat content (1-2%), except for crabs (up to 5%);
- The cold-water shrimp has the lowest fat and saturated fatty acids content (0.3 and 1.6% respectively).



The difference between the warmwater and coldwater shrimp species



- ❖ Canadian northern coldwater shrimp are caught in the Arctic Ocean and is about 6% of the world shrimp catch of all species.
- ❖ About two thirds of the world's catch of shrimp is warmwater species grown in special farms in China, Vietnam, Indonesia and India.
- ❖ Canadian northern coldwater shrimp is smaller compared to the warmwater species and has a number of qualities that enable to make an unequivocal choice in its favor.



The difference between the warmwater and coldwater shrimp species



Warmwater shrimp are raised in special farms and are fed with pelleted feeds containing growth promoters, as well as drugs (antibacterial and antiparasitic) to prevent diseases.

Coldwater shrimp is growing in the wild and feeds on plankton which is environmentally friendly and affects its hygienic and consumer qualities in the best way.



The difference between the warmwater and coldwater shrimp species



The shrimp which grew up in the natural environment has a firm texture and smaller size in comparison with an artificially grown warmwater shrimp.

The Canadian Coldwater Shrimp lives in icy waters and grows very slowly: the average period of her life is 6 years and it takes 4 of them to achieve a sufficient size for sale.

Cultivation of a shrimp to the "market" size in a specialized farm takes 3-4 months.



Few facts about cholesterol



- Cholesterol content in seafood may be higher than in meat, but they are healthier;
- Prevailing polyunsaturated fatty acids neutralize the negative effect of cholesterol;
- It is proven that regular consumption of seafood helps decrease the LDL cholesterol in the blood.



Vitamins content



Water-soluble: vitamins - B1, B2, B3 and B12;

Fat-soluble vitamins A and D.





Mineral content

- ❖ Copper, magnesium, manganese, iron and cobalt are a part of some enzymes required for hematopoiesis. Potassium and magnesium are necessary for blood vessels and heart muscle.
- ❖ The salts of calcium, magnesium and phosphorus are involved in forming bone, teeth, normalize blood clotting, improve the activity of the heart and nervous system.
- ❖ Chlorine is required for the formation of gastric juice and blood plasma.
- ❖ Fluoride is essential for tooth enamel and preventing tooth decay.



Mineral content

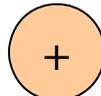


- Iodine (I^{127}) is the heaviest and largest element in the periodic table to be found in a naturally occurring biological molecule.
- Iodine is a rare element, 64th in abundance (approximately $1-3 \cdot 10^{-5}$ % of the earth's mantle).
- Coldwater shrimp are a rich source of Iodine.



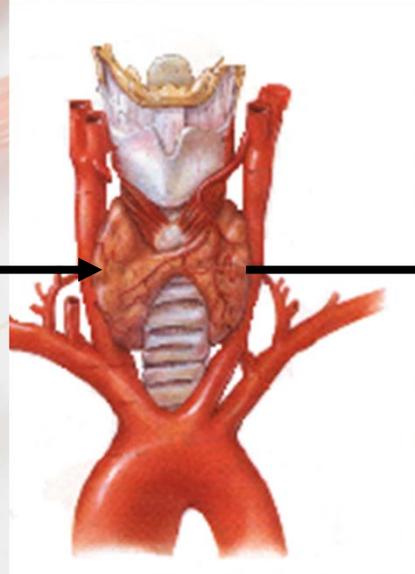
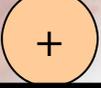


TRH
hypothalamus



TSH
pituitary

thyroide



T4; T3



Thyroid function

- Brain
- Bone
- Liver
- heart
- muscle
- skin



Thyroid hormone is essential in period of:



❖ **Adolescence**

❖ **Pregnancy**

❖ **Adulthood**

❖ **Aging**

❖ Every cell in one's body has receptors for thyroid hormone and needs thyroid hormone to maintain normal function.



Daily requirements for Iodine



- ❖ Baby: 50 µg per day
- ❖ Child 1-6 years: 90 µg per day
- ❖ Child 7-12 years: 120 µg per day
- ❖ Adolescent/ Adult: 150 µg per day
- ❖ Pregancy, lactation: 200-300 µg per day
- ❖ (WHO 1996)



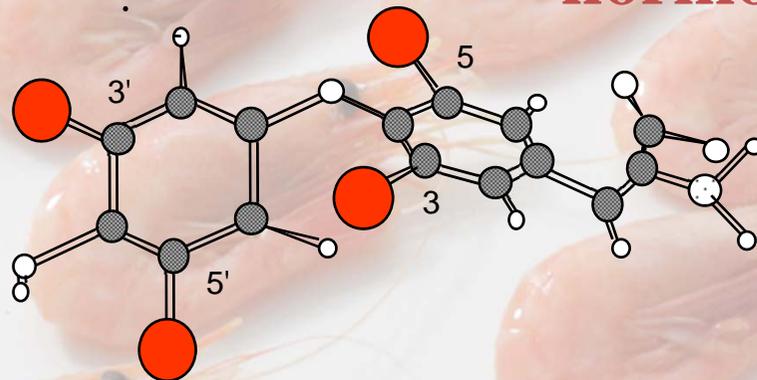
A recent European study showed:



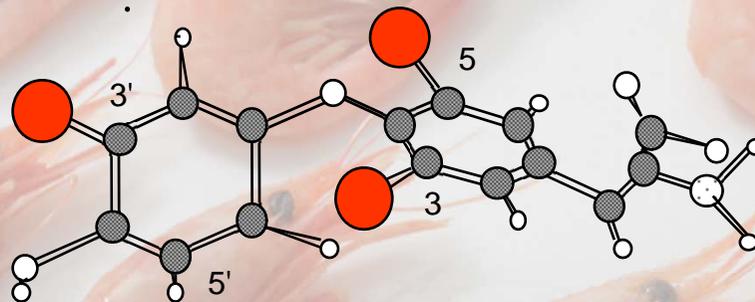
- Many young women have a mild Iodine lack
- Risk: accentuated lack during pregnancy
- Children may have up to 10 IQ points less than children born to mothers with sufficient Iodine supply
- Recommendation: Iodine supplements (as for iron) during pregnancy.



Iodine is an essential component of the thyroid hormone



3,5,3',5'-tétra-iodo-L-thyronine
or Thyroxine or T4



3,5,3'-tri-iodo-L-thyronine
or Triiodothyronine or T3

Salt iodization: advantages and disadvantages



Advantages:

the most affordable method of providing the human body with Iodine. Low cost of iodine helps to avoid the huge social cost of mental retardation.

Disadvantages:

- Iodine is destroyed by heat treatment
- During pregnancy, hypertension, cardiovascular disease and kidney disease is often recommended to limit consumption of salt;
- Iodized salt does not satisfy the need for Selenium.



Selenium is required in the following processes:



- ❖ Synthesis and activation of thyroid hormone
- ❖ Antioxidant processes
- ❖ Reproductive function
- ❖ The immune response
- ❖ The metabolism of insulin
- ❖ Prevention of cancer pathology



Daily requirements for Selenium



- 55 -75 μg / day
- Certain authors suggest the intake 200 μg per day as anticancer effects of Selenium operate around these levels.
- However, Iodine and Selenium are present in foods in trace (very small) amounts.



EUFIC* information on iodine



- ❖ EU PRI (1) PER DAY
- ❖ European Union Population Reference Intake for males aged 18 years and over; values in italics indicate "acceptable range of intakes »: 130 µg
- ❖ BEST SOURCES: Sea fish, shellfish, cod liver oil and milk.
- ❖ FUNCTIONS: Necessary for normal function of thyroid gland and hence, brain development and function metabolic rate.
- ❖ DEFICIENCY SYMPTONS: Goitre (enlarged thyroid).
- ❖ SERVING TIPS: Iodised salt is an ideal help in preventing deficiency.
- ❖ DID YOU KNOW? Worldwide, about 0.5 billion are iodine deficient.
- ❖ *EURFIC= European Food information council.



EUFIC* information on Selenium



- ❖ EU PRI (1) PER DAY
- ❖ European Union Population Reference Intake for males aged 18 years and over; values in italics indicate "acceptable range of intakes »: 55 ug.
- ❖ BEST SOURCES: protein-rich animal products (meat, eggs, etc.), seafood, certain mushrooms and cereals.
- ❖ FUNCTIONS: protects cells against oxidative damage. Stimulates the immune system.
- ❖ SERVING TIPS: eat seafood and cereal foods.
- ❖ DID YOU KNOW? When used with vitamin E may increase the well-being (e.g. mental alertness, anxiety, fatigue) of elderly people.
- ❖ DEFICIENCY SYMPTONS: low levels linked with muscular weakness, cardiomyopathy.



Iodine and selenium contents of selected Fish and Shellfish



Seafood	Iodine (µg/100g)	Selenium (µg/100g)
Herring	29	35
Plaice	33	37
Mackerel	140	30
Salmon	76	24
Oyster	60	23
Mussel	140	51
Lobster(boiled)	100	130
Shrimp (boiled)	100	46

Comparison with other foods



❖ Daily requirements

- ❖ Iodine 150-200 µg/day
- ❖ Selenium 75 µg/day*

❖ Cereals /meat

- ❖ 10-12 µg Selenium /100g
- ❖ and only 3 -10µg Iodine/100g

❖ Mussels

140µg Iodine and 50µg Selenium/100g

❖ Lobster

100µg Iodine and 130µg Selenium/100g

❖ Shrimp

100µg Iodine and 46µg Selenium/100g

Astaxanthin



Unique antioxidant that makes the shrimp red when it is cooked.

- Astaxanthin is 10 times stronger than fruit antioxidants and 500 times stronger than vitamin E.
- Astaxanthin protects cells from premature aging, toxins, radiation and stress.
- Astaxanthin has a beneficial effect on the cardiovascular system, prevents heart attacks and strokes.



Conclusions



- Rare elements Iodine and Selenium are needed for normal brain development and function throughout life (fertility, immune system etc.)
- Shrimps (marine) provide a particularly rich source of both Iodine and Selenium, as do mussels, oysters and lobster.
- They are therefore an excellent source of essential and rare minerals needed for optimum brain function and general metabolism.

