



*The PERFECT PEARL of
Nature*

**CAVIAR
EXTRACT**

HISTORY OF CAVIAR

*During the middle ages, sturgeons were known as the Royal Fish in England, because King Edward II decreed that any of it that was caught had to be given to the feudal Lords. However, it is a well-known fact that the Persians were the first eaters of this tasty fish egg delicacy. They called it “Chav-Jar”, which is translated to “**Cake of Power**”.*



Aristotle said that many lavish Greek banquets would end with trumpet fanfare announcing the arrival of large platters of caviar garnished with flowers.

French caviar production was organized by Louis XVI's minister Jean-Baptiste Colbert in the mid 18th century.

In Russia, the Czars were the major caviar consumers.

Root related that Nicolas II taxed the sturgeon fishers what amounted to a hefty 11 tons of topgrade caviar every year.

The caviar given to the Czars was the rarest and, often the most cherished of all caviar - the small golden eggs of the Sterlet sturgeon.

CAVIAR PRODUCTION

Caviar is composed of sturgeons eggs. Eggs are gently placed over a large wire grate and passed back and forth over this sieve to separate berries of different size.

The eggs are collected in a metal tin, and are rinsed with fresh water to remove debris.

Once they are cleaned, the "master" of salt blender will come to classify and salt eggs.

Size and colour are taken into account for the classification.

The sea salts originates from the mouths of many different rivers in Russia. It is purified and free of iodine. The salt acts as a preservative and as a curing agent for the caviar.

After the salt curing, eggs become firmer. Borax is added to the caviar destined to Europe for giving it a softer and sweeter taste.

Traditionally, eggs come from four species of sturgeons, which are considered to produce the best caviar: the Beluga, Osetra, Sevruga and Sterlet.



CAVIAR EXTRACT

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COMPOSITION (ACCORDING TO BIBLIOGRAPHIC REFERENCES)

Caviar is a fully energetic product. It is highly appreciated for its components: proteins, fatty acids and vitamins.

Proteins available in caviar mainly include following amino acids: Arginine, Histamine, Isoleucine, Lysine and Methionine.

The fat part contains cholesterol (25%) and lecithin (75%).

Caviar is also composed of significant amount of vitamins as A (retinol), C (ascorbic acid), PP or B3 (niacine), B2 (riboflavine), B5 (panthotenic acid), B6 (pyridoxine) and B12 (cobalamine).

Liposoluble caviar extract references will contain fatty acids and vitamin A (retinol). On the other hand, hydrosoluble and dry caviar extract references will contain proteins, and the other vitamins.

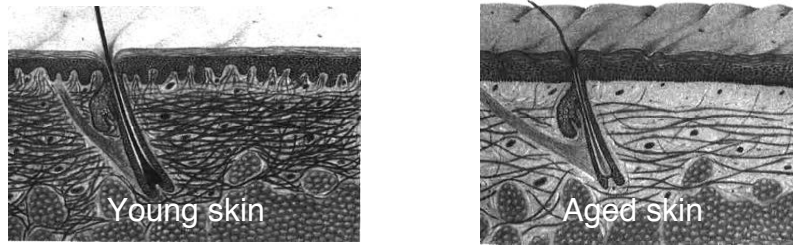
COSMETIC PROPERTIES

Ageing is an irreducible phenomenon, which implies several changes in the skin behaviour.

At the dermis level, it exists an atrophy of conjunctive tissues and there is a decrease in fibroblast proliferation, which is associated to a rigidification of tissues linked to glycation process. The reduction in glycoaminoglycans implies a decrease in turgescence state of cell and a reduction of skin tonicity.

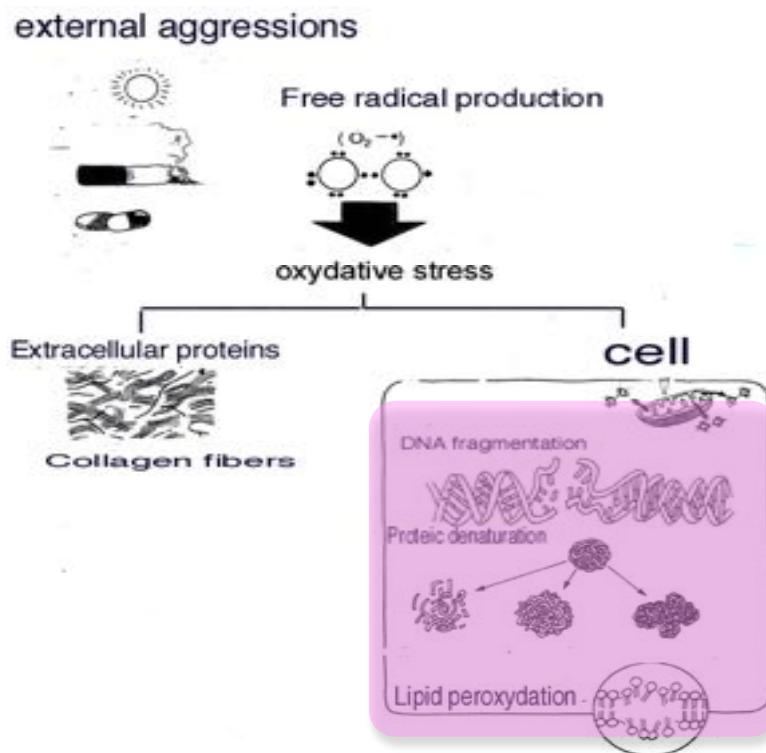
At the epidermis level, desquamation becomes irregular. There is a progressive disappearance of hydrolipidic film and the skin becomes grey and loses its brightness. The epidermis becomes thinner.

This phenomena result in wrinkles apparition.



Genetic and environmental factors are closely implied in ageing process. Several external agents are able to accelerate ageing: tobacco, stress, bad hygiene life, UV rays, pollution... contribute to accelerate ageing process.

Factors speeding up ageing



However, topically applied, several factors can help to preserve skin against ageing.

Because of rich content in proteins (hydrosoluble and dry references) and fats (liposoluble references), Caviar extracts constitute excellent ingredients for bringing some nutritive elements to skin and to contribute to limit signs of ageing.

CAVIAR EXTRACT

ANTI-AGEING ACTIVE

THANKS TO ITS NUTRITIVE PROPERTIES

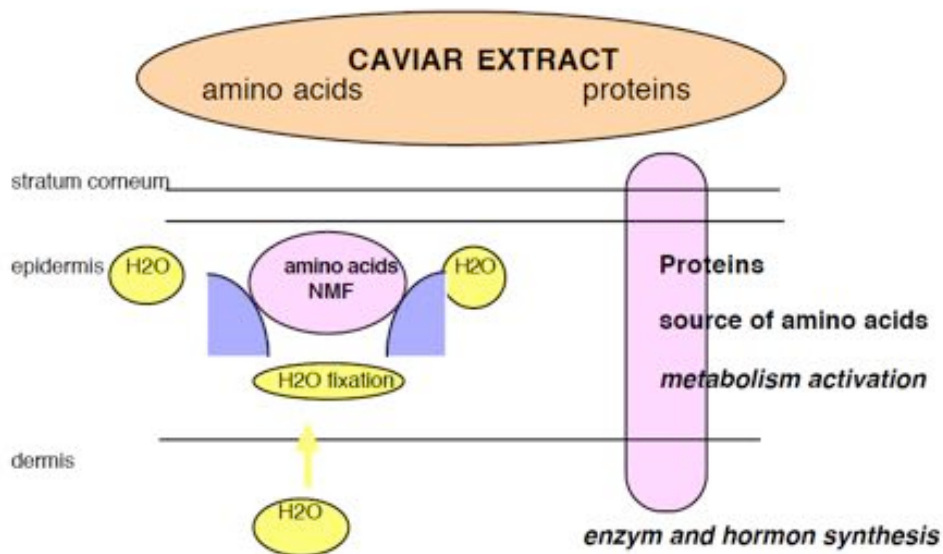
Caviar extract is able to supply several nutritive ingredients

PROTEINS (HYDROSOLUBLE AND DRY REFERENCES)

External apply of amino acids which are more particularly found into skin can be useful for a nutritive action.

Amino acids are essential for protein biosynthesis. They are also precursor of hormones and enzymes. In this condition, amino acids constitute some key elements for cell nutrition and metabolism.

More than nutritive effect, amino acids have also some moisturizing effect. They play part in composition of the NMF (Natural Moisturizing Factor), which is known to be able for fixing water as amino acids have hygroscopic properties.



Thanks to its protein and amino acids content, Caviar extract can be used as nutrients in living cells and has useful moisturizing effect for restructuring the skin.

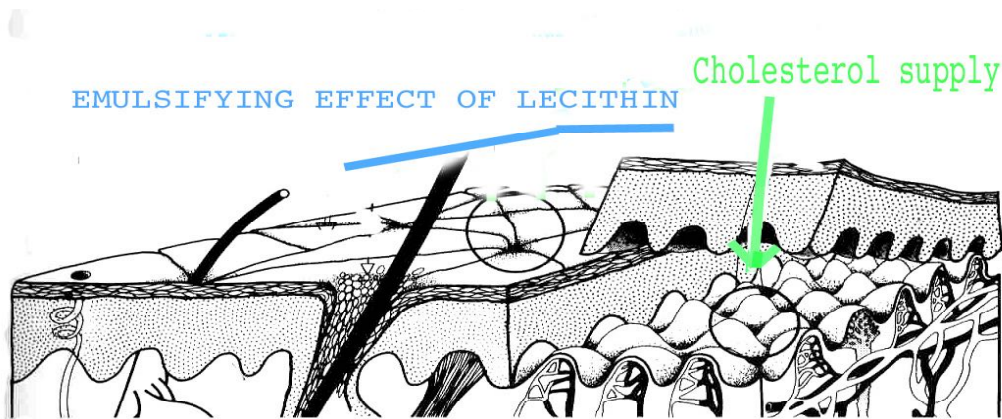
LIPIDS (LIPOSOLUBLE REFERENCES)

The differentiation of epidermis cells is associated to lipids metabolism. The nature of lipid fraction that constitutes the intercellular cement is important for controlling cutaneous permeability.

For limiting the ageing process, it is essential to preserve the barrier function of *stratum corneum* and consequently the state of hydrolipidic film.

The composition of the hydrolipidic film is closely dependant of ceramides, cholesterol and fatty acids. Cholesterol is a major constituent of cellular membrane. It represents 14% of lipids of the corneous layer. Cholesterol will incorporate at the *stratum corneum* surface and mix to hydrolipidic film, adding to the intercorneocytes lipids of the epidermis superficial layer. Cholesterol coming from Caviar extract contributes to preserve nature of hydrolipidic film.

Caviar extract also contains lecithin, which has also emulsifying property that is benefit for giving to skin a better tissue plasticity.



Thanks to cholesterol and lecithin supply, Caviar extract improves tissue elasticity and preserves barrier function by compensating fatty unbalance that occurs during ageing.

VITAMINS

The presence of a good balance in several vitamins at skin level improves skin state and contributes to preserve it younger.

During ageing phenomenon, oxidative metabolism increases and thus free radicals appear in too much large amount. These free radicals are highly unstable. Their production can be increase by pollution, irradiation or other external factors. They have bad action on several macromolecules.

There are some natural detoxifying system as enzymes or vitamins E, C, K and A.

During ageing, the natural system becomes overpassed. In this condition, supply of vitamins for helping the natural system of defence is benefit.

In hydrosoluble and dry Caviar extracts, vitamin C has antiradicalar activity, which is benefit for fighting against free radicals aggressions. Vitamin B6 has antioxidant effect too and is implied in essential fatty acids metabolism. It participates to the constitution of lipidic film. It has a trophic activity too.

Then, in liposoluble Caviar extract, vitamins A and E have a trophic activity. More particularly, vitamin A has also some regenerative activity and vitamin E has antioxidant properties.



Vitamins contained in Caviar extracts help the skin to fight against free radicals aggressions, which imply some cellular damages. Also, these vitamins have some benefit nutritive properties.

CAVIAR EXTRACT

THE PERFECT PEARL OF NATURE

PROTEINS

CHOLESTEROL
LECITHIN

VITAMINS

Moisturizing

Stimulation of
metabolism

Anti-oxydant
Regenerative

Anti-ageing cream

Emollient cream

Nutritive cream

BIBLIOGRAPHIC REFERENCES

- Caprino F, Moretti VM, Bellagamba F, Turchini GM, Busetto ML, Giani I, Paleari MA, Pazzaglia M. Fatty acid composition and volatile compounds of caviar from farmed white sturgeon (*Acipenser transmontanus*). *Anal Chim Acta*. 2008 Jun 9;617(1-2):139-47.
- Czeczuga B. Carotenoids in Fish. XXXII. Content of carotenoids in eggs utilized in the form of caviar. *Folia Histochem Cytochem (Krakow)*. 1982;20(1-2):63-8.
- Czeczuga B., Kolman R., Czeczuga-Semeniuk E., Szczepkowski M., Semeniuk A., Kosielinski P., Sidorov N. Carotenoid composition in the muscles of Siberian sturgeon (*Acipenser baerii* Br.) and sterlet (*A. ruthenus* L.) juveniles fed feed supplemented with Vitaton. *Archives of Polish Fisheries*. 2006, vol: 14, n°: 2, pages: 213-224.
- Engström K, Wallin R, Saldeen T. Effects of Scandinavian caviar paste enriched with a stable fish oil on plasma phospholipid fatty acids and lipid peroxidation. *Eur J Clin Nutr*. 2003 Sep;57(9):1052-9.
- Gessner J., M. Wirth, F. Kirschbaum, A. Krüger, N. Patriche. Caviar composition in wild and cultured sturgeons – impact of food sources on fatty acid composition and contaminant load. *Journal of Applied Ichthyology*. Volume 18, Issue 4-6, pages 665–672, December 2002
- Gussoni M, Greco F, Vezzoli A, Paleari MA, Moretti VM, Lanza B, Zetta L. Osmotic and aging effects in caviar oocytes throughout water and lipid changes assessed by 1H NMR T1 and T2 relaxation and MRI. *Magn Reson Imaging*. 2007 Jan;25(1):117-28.
- Hu J, Zhang Z, Wei Q, Zhen H, Zhao Y, Peng H, Wan Y, Giesy JP, Li L, Zhang B. Malformations of endangered Chinese sturgeon, *A. sinensis*, and its causal agent. *Proc Natl Acad Sci U S A*. 2009 Jun 9;106(23):9339-44.
- Keyvanfar A, Rochu D, Fine JM. Comparative study of sturgeon oocyte soluble proteins by isoelectric focusing. *Comp Biochem Physiol B*. 1988;90(2):393-6.
- Li P, Hulak M, Rodina M, Sulc M, Li ZH, Linhart O. Comparative protein profiles: potential molecular markers from spermatozoa of *Acipenseriformes* (Chondrostei, Pisces). *Comp Biochem Physiol Part D Genomics Proteomics*. 2010 Dec;5(4):302-7.
- Lu X, Webb M, Talbott M, Van Eenennaam J, Palumbo A, Linares-Casenave J, Doroshov S, Struffenegger P, Rasco B. Distinguishing ovarian maturity of farmed white sturgeon (*Acipenser transmontanus*) by Fourier transform infrared spectroscopy. *J Agric Food Chem*. 2010 Apr 14;58(7):4056-64.
- Marotta F, Polimeni A, Solimene U, Lorenzetti A, Minelli E, Jain S, Rastmanesh R, Sedriep S, Soresi V. Beneficial modulation from a high-purity caviar-derived homogenate on chronological skin aging. *Rejuvenation Res*. 2012 Apr;15(2):174-7.
- Maury-Brachet R, Rochard E, Durrieu G, Boudou A. The 'storm of the century' (December 1999) and the accidental escape of Siberian sturgeons (*Acipenser baerii*) into the Gironde estuary (southwest France). An original approach for metal contamination. *Environ Sci Pollut Res Int*. 2008 Jan;15(1):89-94.
- Murzina SA, Nefedova ZA, Ripatti PO, Nemova NN, Markova LV. Dynamics of fatty acid composition of total lipids during embryonic development of Atlantic salmon *Salmo salar* L. *Ontogenez*. 2012 Mar-Apr;43(2):154-60.
- Psenicka M, Alavi SM, Rodina M, Gela D, Nebesarova J, Linhart O. Morphology and ultrastructure of Siberian sturgeon (*Acipenser baerii*) spermatozoa using scanning and transmission electron microscopy. *Biol Cell*. 2007 Feb;99(2):103-15.
- Saber Khodabandeh, Mehrdad Noruzinia. UV-absorbing compounds extracted from the Persian sturgeon caviar and *Artemia urmiana* cysts and their UV protective effects on human skin fibroblasts. *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology*, V 153, Issue 2, Supplement, June 2009, Page S162.
- Vertkin AL, Martynov IV, Bikbov TM, Zharov EI, Popova IM, Svetova IuB, Vasiagin AI, Shafranskiĭ IuA, Zolina VI, Martynov AI. Use of food products containing polyunsaturated fatty acids of the omega-3 group in patients with disorders of lipid metabolism. *Kardiologiia*. 1991 Jun;31(6):59-61.
- Xie Z, Niu C, Zhang Z, Bao L. Dietary ascorbic acid may be necessary for enhancing the immune response in Siberian sturgeon (*Acipenser baerii*), a species capable of ascorbic acid biosynthesis. *Comp Biochem Physiol A Mol Integr Physiol*. 2006 Oct;145(2):152-7.
- Yan Wang, Jian-xing Yu, Chen-lu Zhang, Ping Li, Yu-sheng Zhao, Meng-hui Zhang, Pei-gen Zhou. Influence of flavonoids from *Phellinus igniarius* on sturgeon caviar: Antioxidant effects and sensory characteristics. *Food Chemistry*, Volume 131, Issue 1, 1 March 2012, Pages 206-210.
- www.cites.org, <http://www.iwmc.org>.