Nutrisea

INTRODUCTION

Caviar is the name given to the roe of sturgeon (*Acipenser spp*.) extracted directly from the female fish.

Caviar is nowadays one of the most select and prized cosmetic ingredients with a high cosmetic value based on its essential amino acids, structuring peptides, proteins, essential fatty acids and oligoelements, with a strong repair and regenerative power.

Therefore, it is generally used in products for aged-skin care. Aged skin requires intense nutrition in order to recover the elements it has lost with the passage of time.

Nutrisea is the water soluble extract of Caviar.

CHEMISTRY

Scientific research indicates that caviar has unusually high proportions of vitamins, minerals, lipids and proteins. All of this makes caviar an up-to-date ingredient for cosmetic formulations designed as elixirs of eternal youth.

- **Proteins**
  Caviar is a protein-rich product (table 1) mainly containing the following amino-acids: arginine, histidine, isoleucine, lysine and methionine.
  (www.nvogue.com/nVogueFoods/Caviar/caviarguide.htm).

- **Lipids**
  Caviar lipids mainly include cholesterol (25%) and lecithin (75%).
  (www.nvogue.com/nVogueFoods/Caviar/caviarguide.htm).

- **Vitamins**
  Caviar contains large amounts of vitamin A, vitamins B_2, B_6, B_{12}, niacin, pantothenic acid and folic acid.
  (www.nvogue.com/nVogueFoods/Caviar/caviarguide.htm).

- **Minerals**
  Caviar contains high proportions of calcium, magnesium, phosphorus, potassium and sodium (table 1).

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Centerchem, Inc
Norwalk, CT 06850
www.centerchem.com
203-822-9800

Table 1 shows the chemical composition of caviar.

Chemical composition of caviar	
Calories (kcal/100g)	252
Water (g/100g)	47.5
Proteins (g/100g)	24.6
Total lipids (g/100g)	17.9
Carbohydrates (g/100g)	4
Ash (g/100g)	6.5
Fatty acids	
Saturated fatty acids (g/100g)	4.06
Monounsaturated fatty acids (g/100g)	4.631
Polyunsaturated fatty acids (g/100g)	7.405
Minerals	
Calcium (mg/100g)	275
Iron (mg/100g)	11.88
Magnesium (mg/100g)	300
Phosphorus (mg/100g)	356
Potassium (mg/100g)	181
Sodium (mg/100g)	1500
Zinc (mg/100g)	0.95
Copper(mg/100g)	0.11
Manganese (mg/100g)	0.05
Selenium (µ/100g)	65.5
Vitamins	
Thiamin (mg/100g)	0.19
Riboflavin (mg/100g)	0.62
Niacin (mg/100g)	0.12
Pantothenic acid (mg/100g)	3.5
Vitamin B6 (mg/100g)	0.32
Folate (folic acid) (µg/100g)	50
Vitamin B12 (µg/100g)	20
Vitamin A (µg/100g)	1870
Vitamin A (IU/100g)	561
Retinol (µg/100g)	561
Vitamin E (µg/100g)	7
Vitamin K (µg/100g)	0.7
Carotenoids	
Lutein & Zeaxanthin (µg/100g)	720

Table 1. Chemical composition of caviar (www.weightlossforgood.co.uk/).

TRADITIONAL USES

Besides being consumed as a food, caviar is also used as an essential component of creams and beauty treatments.

The cosmetic properties of caviar are known since the middle of the XX century. Research studies revealed that caviar promotes skin rejuvenation, because the chemical composition of caviar cells is very similar to that of young epidermal cells, with large proportions of essential fatty acids, amino acids, mineral salts, vitamin B, zinc and iron.

COSMETIC PROPERTIES

Skin repair activity

- **Proteins**
  Proteins have affinity for skin and hair, which makes them beneficial in dermatological processes.
  Proteins and protein hydrolysates have a long list of beneficial effects for skin. Their main actions are: moisturizing, improving elasticity, soothing and firming. However, not all of the proteins show these properties to the same degree.

  The functionality of these proteins is closely related to their structure and molecular weight. Low molecular weight proteins (<1000 Da) and amino acids show good skin penetration power. High molecular weight proteins (>80000 Da) show poor penetration power, but remain on the stratum corneum, where they act as excellent filmogenic agents (Griesbach et al., 1998).

  Challoner NI et al (1997) evaluated the moisturizing effects of different proteins. In a first assay, they evaluated the moisturizing effects of an O/W emulsion containing 1% of a protein hydrolysate. The results showed that the emulsion containing the protein hydrolysate significantly increased immediate skin extensibility (Ei).

  They also evaluated the tightening effects of two high molecular weight proteins in aqueous solution. The results showed that incorporating proteins into an aqueous formulation significantly decreased Ei during the treatment period. This finding could be explained by the ability of proteins to form a coating film on the skin surface, which resulted in tightening effects.

  Thus, low molecular weight proteins are good moisturizing agents, while high molecular weight proteins are good conditioning and firming agents. In this way, the deleterious effects of aging on the biomechanical properties of skin may be counteracted.

- **Lipids**
  Several clinical studies have shown that topical applications of fatty acids (and their polyunsaturated derivatives) soothes the skin and considerably reduces transepidermal water loss (Wright S., 1991). Conti A. et al. (1995) and Jiménez-Arnau A. (1997) also verified these properties of fatty acids.

- **Vitamins**
  In terms of beauty and functionality, current studies indicate that certain vitamins and their derivatives enhance the performance of cosmetics and toiletries. Furthermore, laboratory and clinical tests provide strong evidence that these vitamins, used in proper amounts, play an important role in the protection, correction, and renewal processes of skin. Laboratory and clinical studies indicate that topically applied vitamins are beneficial to treat several skin disorders and especially to prevent, delay or arrest certain age-associated degenerative changes, such as skin dryness and desquamation, as well as the formation of wrinkles.

  Furthermore, the naturalness of vitamins has prompted their use in creams and lotions to maintain a soft and smooth skin by “replenishing nature’s moisture”. Of particular interest to cosmetic formulations are vitamins E, A, and C. These vitamins are functional, they penetrate the skin and, when used in proper amounts, they are safe and free of side effects (Idson B, 1993).

Therefore, caviar extract is highly recommendable to formulate cosmetic products with skin repair and conditioning activity.

Vitamin and mineral replenishing activity

Caviar has a potential of nutrients in a natural balance, which allows absorption, thus restoring nutrient deficiencies in different organs and tissues.

Incorporation of caviar to the world of cosmetics helps restore the natural skin balance, due to its vitamins and minerals. Caviar absorbs sea mineral salts, calcium, phosphorus and vitamins. These elements provide a natural way to recover the skin vitality and to improve its appearance.

Thus caviar extract is highly recommendable to formulate cosmetic products with skin stimulating and revitalizing activity.

COSMETIC APPLICATIONS

Action	Active	Cosmetic Applications
Skin repair	Proteins Lipids Vitamins	-Moisturizing -Emollient -Firming -Antiaging for aged skin
Vitamin and mineral replenishing	Vitamins Minerals	-Stimulant -Revitalizing

RECOMMENDED DOSE

The recommended dose is between 0.5% and 5.0%.

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Web sites:
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www.weightlossforgood.co.uk [accessed Febraury 2007].