Neptune Krill Oil

Marine phospholipids bonding omega-3 fatty acids and antioxidants
Market Opportunities

The expected trend in the wholesale Omega-3 market is for continued substantial growth: from 2.1 billion in 2012 to 4.1 billion by 2018. In fact, Omega-3 sourced from marine oils is the fastest growing sector in the polyunsaturated fatty acid (PUFA) ingredient market today. Scientific research has demonstrated the health benefits related to Omega-3 consumption, and media attention on this topic has greatly increased consumer awareness.

An independent omega-3 market report published by Frost & Sullivan reported that the krill oil market has already captured over 2% of total omega-3 B2B sales and is expected to increase to 5% over the next three years. Consumer demand for superior Omega-3 products will continue to grow exponentially.

Neptune Krill Oil (NKO®) is exceptionally well positioned in the market due to its strong scientific focus and patented extraction process. NKO® provides superior Omega-3 (EPA and DHA) levels with better bioavailability and antioxidant content, and contains up to seven times more of the powerful antioxidant astaxanthin than other krill oils. NKO® is also the only Halal certified krill oil; no alcohol is used in the extraction process.

Neptune has been successful in obtaining many multinational approvals including:

New Dietary Ingredient (NDI) status
Generally Recognized as Safe (GRAS) status from the Food and Drug Administration (FDA) in the United States
Complementary Medicine status from the Therapeutic Goods Administration (TGA) in Australia
Natural product number (NPN) from the Natural Health Products Directorate (NHPD) from Health Canada
Novel Food and Parnuts for commercialization in the European Union from the European Food Safety Authority (EFSA)

The product ‘Neptune Krill Oil’ of the company Nutrisan has won “Award Nutri- & Phytotherapy, Best product 2010” in Belgium

“Neptune Krill Oil” is thus confirmed in its status as innovative product and further distinguishes itself from its krill oil competitors.
What is krill?

Krill is a generic term used to designate deepwater marine planktonic crustacean species. It looks like miniature shrimp, ranging between one and six centimetres in length. These 85 species represents the planet’s most abundant animal biomass found in banks that may extend over several square kilometres. Neptune sources its krill from the Antarctic Ocean.

Product composition

Krill oil is composed of 40 % phosphatidylcholine, 30 % omega-3 fatty acids as EPA and DHA, astaxanthin, vitamin A, vitamin E, various other fatty acids and a novel marine flavonoid. The structure of the primary constituent in krill oil appears to contain choline, glycerophosphate and DHA and EPA esterified to astaxanthin and the novel marine flavonoid, respectively.

NKO has an excellent ratio omega-3/6/9 of 15:1:6. This is the ideal omega mix as a complement to the Western diet that contains too much omega-6.

The synergy of astaxanthin and the novel bioflavonoids in NKO® contributes to the exceptional stability and antioxidant potency of Neptune Krill Oil.

The graphic below shows the enormous antioxidant capacity of Neptune Krill Oil by means of the ORAC value.

ORAC VALUE

- 47 times greater than Omega-3 (18:12) Fish Oil
- 34 times greater than Co-Q10
- 6.5 times greater than Lycopene
- 4.0 times greater than Cranberry
- 2.6 times greater than Elderberry
Pattened cold extraction procedure

Neptune’s unique patented extraction process results in enhanced bioactives, further improving digestibility, absorption, efficacy compared to fish oil. The synergistic effects of omega-3 fatty acids and phospholipids are specific to NKO since the solvent-based cold extraction process used to produce this oil maintains the integrity of the phospholipids. Processes for fish oil extraction can involve conditions that irrevocably damage certain components like phospholipids.

**BENEFITS OF NEPTUNE OCEAN EXTRACT™ PROCESS:**

- Cold extraction procedure preserves all the bioactive properties of extracted components
- Guarantees a very high stability of the product
- Halal certified: no alcohol used in the extraction process
- No added preservatives required

Astaxanthin

Krill oil contains astaxanthin, a red colored carotenoid that gives the red color to krill, salmon or flamingo. Astaxanthin is known for its very high antioxidant level. Neptune Krill Oil contains naturally 7 times more astaxanthin than other krill oil products that are being offered on the market. The preservation of all the astaxanthin is due to the unique patented cold production process! This high level of astaxanthin protects the oil against oxidation.

The certificate of analysis of NKO shows a value of ± 1.1. This is an extremely good value as many fish oils have a totox-value between 6 and 12. Totox (total oxidation value) is used to describe total oxidation to which an oil has been exposed; the lower the value, the fresher the oil is.
Neptune Krill Oil® is different from fish oil and other omega-3 sources because the omega-3 fatty acids are attached to **phospholipids** whereas the omega-3 in fish oil is attached to triglycerides or ethyl esters. Phospholipids are a component of every cell in our body. Together with cholesterol, phospholipids are the building blocks of cell membranes!

The phospholipids in NKO® contribute to a better absorption of EPA & DHA. The extra advantage is that the level of phospholipids itself also increases in the body.

The association between phospholipids and long-chain omega-3 fatty acids highly facilitates the passage of fatty acid molecules through the intestinal wall, increasing bioavailability and ultimately improving the omega-3: omega-6 fatty acid ratio.

When compared to omega-3 in fish oil, the omega-3 in NKO® are up to two and a half times more bioavailable.

**Phospholipids & Bioavailability**

NKO® is 2.5 times significantly more bioavailable than regular fish oil!

NKO® demonstrates a greater increase of Omega-3 index and provides higher bioavailability of EPA & DHA compared to other sources of Omega-3 (see graphic below).

**Design**
- Human study, Perspective, Randomized, Double Blind

**Dosage**
- Standardized to 120 mg of EPA & DHA/day

**Omega-3 index**
- New Risk Factor for cardiovascular diseases. Indicates the amount of EPA & DHA in red blood cells versus total fatty acids. Closer to 8 = lower risk for cardio diseases

**Omega-3 index**
- NKO® like blend
- NKO®
- Fish Oil
- Ethyl Esters

**IMPORTANT FACTS**

Omega-3 fatty acids as phospholipids (like in krill oil) are absorbed partly undigested from the gastrointestinal tract

- omega-3 fatty acids as triglycerides (like in fish oil) need to be digested first.
- Krill oil benefits for patients who have difficulties in digesting fat.

Omega-3 fatty acids as phospholipids (like in krill oil) are more soluble in the intestinal lumen than omega-3 fatty acids as triglycerides; triglycerides need bile to dissolve properly.

- It would be wise for individuals with poor gall bladder functioning or those who have their gall bladder removed, to choose for krill oil.

1. As measured by the area under the curve (AUC) of the omega-3 index in red blood cells over 112 days of supplementation. AUC results were 67% vs 26% days in NKO vs Fish oil, respectively.
2. Results Standardized to baseline. Clinical Study Report. NO. BTS 275/07. February 16, 2009. Esslingen, Germany
### Krill vs Fish Oil

<table>
<thead>
<tr>
<th></th>
<th><strong>Krill Oil</strong></th>
<th><strong>Fish Oil</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source of Omega-3</strong></td>
<td>EPA &amp; DHA</td>
<td>EPA &amp; DHA</td>
</tr>
<tr>
<td><strong>Phospholipids</strong></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Astaxanthin</strong></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Bioavailability</strong></td>
<td>High absorption of omega-3</td>
<td>Limited absorption of omega-3</td>
</tr>
<tr>
<td><strong>Sustainability</strong></td>
<td>Krill = largest animal biomass on the planet</td>
<td>Fishery = under pressure</td>
</tr>
<tr>
<td><strong>Antioxidant Capacity</strong></td>
<td>Strong antioxidant</td>
<td>Limited antioxidant capacity</td>
</tr>
<tr>
<td><strong>Digestibility</strong></td>
<td>Easy to digest</td>
<td>Difficult to digest</td>
</tr>
<tr>
<td><strong>Stability</strong></td>
<td>High stability</td>
<td>Limited stability</td>
</tr>
<tr>
<td><strong>Acid Reflux or Fishy Aftertaste</strong></td>
<td>No</td>
<td>Possible</td>
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### Highlight

**Fish oil** Omega-3 is carried by fat-soluble triglycerides. This molecular structure makes the Omega-3 less efficiently digested. It pools at the top of the stomach, resulting in aftertaste and fishy burps. That indigestion means the product is digesting poorly.

**Krill oil** Omega-3 is carried by phospholipids. This molecular structure has a water-soluble head and two fat-soluble tails. This facilitates distribution and uptake through the gastrointestinal tract. That means no indigestion and enhanced uptake. More Omega-3 gets to where it's needed most!

Fish oil Omega-3 tends to pool at the top of the stomach causing indigestion and fishy aftertaste. Krill oil Omega-3 distributes evenly, doesn't cause reflux, and digests easily. Consumers report a high level of digestive comfort with krill supplements as well as a lack of regurgitation (fishy burps).

Krill oil instantly mixes in with stomach fluids, which reduces the fishy burps and fishy aftertaste. While fish oil swims up in the stomach and causes fishy burps and a fishy aftertaste.
Sustainability & Eco-harvesting

Nutrisan cares about the eco-system and attaches great importance to the sustainability of krill

Individually, most krill are miniscule, growing to about 5 centimeters. But collectively, they are a massive organism. While there are 85 species of krill in multiple locations throughout the globe, the krill that is harvested for Neptune Krill Oil is Antarctic krill (Euphausia superba).

Estimates for the biomass of Antarctic krill (Euphausia superba) are between 400 and 420 million tons.

The Scientific Committee of CCAMLR (Commission for the Conservation of Antarctic Marine Living Resources) has set precautionary catch limits on the krill fishery and keeps it under constant review through a detailed ecosystem approach.

Neptune is proud to have the designation of Friend of the Sea (FOS) certification, meaning that Neptune’s krill oils adhere to strict guidelines to make sustainability a reality.

Neptune’s environmental practices and business conduct have also passed an audit by NSF International, an independent, non-profit organization that provides product certification for public health and the environment, for the exemplary role they play in adhering to environmental best practices for catch quotas outlined in The Antarctic Treaty and monitored by CCAMLR.

For more information


Neptune Krill Oil Licaps, make better best!

Licaps are patented vegetarian capsules that can be filled with liquid or oil. The capsule – besides krill oil filled with nitrogen – is impermeable to oxygen and water and therefore gives no chance to oxidation. This guarantees a high stability and maximum preservation of omega-3 fatty acids. Neptune Krill Oil Licaps are completely odourless due to the complete impermeability.

When asked whether they liked the odor of the Licap NKO, the test panel responded as follows:

Licaps® odor protection confirmed by consumer panel

The wall of the licap is 4 x thinner than that of a krill oil softgel. This guarantees a fast and complete dissolution of the capsule.

61% of the respondents appreciate the absence of odor of the Licaps®

Only 29% of respondents found the odor acceptable
Why choose Neptune Krill Oil Licaps?

- Complete natural Omega-3 fatty acids complex
- Unique patented cold extraction procedure
- Halal-certified
- Superior bioavailability due to phospholipids
- Scientifically proven
- Incredible high antioxidant potency due to the high amount of astaxanthin & marine bioflavonoids
- Sustainability
- No acid reflux or fishy aftertaste
- GMP manufactured
- Safe product: heavy metals, PCB’s, dioxines & pesticides are within the set international limits
- Excellent ratio of omega-3/6/9
- Completely odourless licaps

**Ingredients per licap** Neptune Krill Oil (NKO®) 500 mg

- Astaxanthin
- Phospholipids
- Vitamin E & A
- Omega-3 (EPA/DHA mg)
- Omega-9
- Omega-6
- Marine bioflavonoids
- Choline

**Krill oil may support**

- ✔ A Healthy Heart
- ✔ Normal Cognitive Development
- ✔ Mobility and Flexibility of Joints