New Zealand Green Lipped Mussel Powder has been found to have beneficial effects in assisting with the pain, inflammation and symptoms associated with:

- Osteoarthritis (degenerative joint disease)
- Rheumatoid Arthritis
- Bursitis
- Sports & Exercise Related Injuries
- Lymes Disease
- Inflammatory Skin Conditions
- Connective Tissue Repair
- Injured joints

In addition to joint health, Green Source Organic's Green Lipped Mussel Powder contains a range of omega fatty acids which are not found in any other marine species or plant. These specific fatty acids are beneficial for normal body functioning especially to support bone and joint structures. This rich source of essential fatty acids (Omega 3 and 6) has been shown to:

- Sustain superior health and well being
- Maintain the body's general well being
- Maintain healthy skin condition
- Support healthy brain and cardiovascular functioning

Green Lipped Mussel Extract also contains a rich, complex blend of natural proteins, minerals and mucopolysaccharides.
Green Lipped Mussel Powder’s anti-inflammatory benefits for humans

Green Lipped Mussel Extract also contains a rich, complex blend of natural proteins, minerals and mucopolysaccharides. The following naturally occurring bioactive substances found in Green Lipped Mussel Extract are increasingly being recognized in supporting joint mobility, cartilage maintenance, cardiovascular health, maintaining healthy skin and for general health:

- complex proteins
- polypeptides
- vitamins
- minerals
- omega fatty acids
- enzymes (ie betaine)
- glycosaminoglycans
- chondroitin sulphates
- glycoproteins and polysaccharides

Green Source Organic’s Green Lipped Mussel Powder provides a rich source of all major classes of Glycosaminoglycans (GAGS).

New Zealand’s Green Lipped Mussel Powder

These GAGS are principle components of cartilage and the synovial fluid found in the joint. Most notably, Glycosaminoglycan (a polysaccharide) assists in the repair of joint tissues. These GAGS provide flexibility, elasticity and tensile strength to the articular cartilage. The severity of arthritis is directly related
to the loss of GAGS content with the joint and surrounding cartilage. GAGS can also exert a strong anti-inflammatory action on the connective tissue.

Effectiveness of Green Source Organic's Green Lipped Mussel Powder

What does Green Lipped Mussel Powder do?
Green Lipped Mussel Powder reduces the pain associated with arthritic conditions and may also help to resolve the arthritic condition itself.

What is the evidence that it works?
A study published in the New Zealand Medical Journal demonstrates that Green Lipped Mussel Powder has similar effects on inhibiting prostaglandin biosynthesis when orally fed to laboratory animals as do non steroidal anti-inflammatory drugs. (Note that prostaglandins are biochemicals made in the body at elevated levels during inflammation and that non-steroidal anti-inflammatory drugs are thought to act principally because they inhibit the production of these prostaglandins when inflammation is initiated.)

A 1993 study has demonstrated clearly that a mussel extract (carbohydrate fraction) injected into rats with artificially induced inflammation reduced the inflammation, and that the amount of reduction was proportional to the amount of extract administered. Furthermore, the study shows that when the extract is chemically inactivated before administration, there is no effect of reducing inflammation.

A 1997 published study shows that the lipid fraction of mussel is effective in both the prevention and treatment of inflammation when administered orally to rats.

A study of the carbohydrate fraction from mussel shows that this mussel extract component is more effective than aspirin in reducing inflammation in cultured human cells.

A study conducted in 1980 shows that 76% of rheumatoid arthritis patients and 45% of osteoarthritis patients determined by self assessment that they had reduced symptoms following oral administration of mussel powder. The study concluded that mussel powder “is an effective supplement or possible alternative to orthodox therapy in the treatment of both rheumatoid arthritis and osteoarthritis. It reduces the amount of pain and stiffness, improves the patient ability to cope with life and apparently enhances general health. Added to these benefits is the low incidence of side effects.”

What does it mean?
It means that Green Lipped Mussel Powder and its constituents have been shown to reduce arthritic pain when taken orally, and to inhibit inflammatory processes.

Active Components
Green Source Organic’s Green Lipped Mussel Powder has Glycosaminoglycans (also known as Mucopolysaccharides or GAG) containing heparin sulphate, dermatan sulphate, hyaluronic acid and chondroitin sulphate. These active ingredients are responsible for the anti-inflammatory and lubricating properties and result in ongoing self-repair and replenishment of joints. It also supplies minerals that are needed to metabolise vitamins, enzymes, carbohydrates, and proteins. The total GAG content of Green Source Organic’s Green Lipped Mussel Powder is generally in the range of 2 – 3%. Of this, nearly all is heparin sulphate (about 98%) and only 2% is chondroitin sulphate.

Lipids
Green Lipped Mussel Powder Extract typically contains 4-6% total lipids.

Carbohydrates
Green Lipped Mussel Powder Extract typically contains 20% total carbohydrates.

Continued on next page
**Protein**
Green Lipped Mussel Powder Extract is typically 55 - 60% protein. This protein is constituted from the following amino acids as follows:

<table>
<thead>
<tr>
<th>Protein</th>
<th>Minerals</th>
<th>Typical Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cysteic Acid</td>
<td>7% Na</td>
<td>23,000 (from salt in seawater)</td>
</tr>
<tr>
<td>Aspartic Acid</td>
<td>11% K</td>
<td>9,000 Carbohydrates</td>
</tr>
<tr>
<td>Threonine</td>
<td>5% Mg</td>
<td>3,400 Lipids</td>
</tr>
<tr>
<td>Serine</td>
<td>4% Cu</td>
<td>9 Protein</td>
</tr>
<tr>
<td>Glutamic Acid</td>
<td>14% Zn</td>
<td>70 Cholesterol</td>
</tr>
<tr>
<td>Proline</td>
<td>5% Mn</td>
<td>14 Sodium</td>
</tr>
<tr>
<td>Glycine</td>
<td>9% Fe</td>
<td>290 Potassium</td>
</tr>
<tr>
<td>Alanine</td>
<td>5% Se</td>
<td>0.2 Magnesium</td>
</tr>
<tr>
<td>Valine</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Cysteine</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Methionine</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Isoleucine</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Tyrosine</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Phenylalanine</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Lysine</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Histidine</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Arginine</td>
<td>8%</td>
<td></td>
</tr>
</tbody>
</table>

Green Lipped Mussel Powder Nutritional Composition - Protein

**Minerals**
Published information on our New Zealand Green Lipped Mussel Powder shows the mineral content of Greenshell Mussels as:

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Content ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Na</td>
<td>23,000 (from salt in seawater)</td>
</tr>
<tr>
<td>K</td>
<td>9,000</td>
</tr>
<tr>
<td>Mg</td>
<td>3,400</td>
</tr>
<tr>
<td>Cu</td>
<td>9</td>
</tr>
<tr>
<td>Zn</td>
<td>70</td>
</tr>
<tr>
<td>Mn</td>
<td>14</td>
</tr>
<tr>
<td>Fe</td>
<td>290</td>
</tr>
<tr>
<td>Se</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Typical Analysis

Ash ....................... 9%
Carbohydrates ...... 17% (includes Glycosaminoglycans)
Lipids ................... 13.5%
Protein .................. 55%
Cholesterol ............ 2%
Sodium (Na) ............ 2%
Potassium (K) .......... 1%
Magnesium (Mg) .... 0.2%
Calcium (Ca) .......... 0.3%

**Dosage:** Suggested dose rate is 1,000 - 1,500 mg per day. It should be noted, however, that in some cases the benefits of taking Green Lipped Mussel Powder may take two to three months to become evident.

**Precautions**
Individuals with shellfish allergies should consult their health care professional prior to use of this Green Lipped Mussel Powder.

Green Lipped Mussel Powder is used in marine feed applications equine, canine and feline formulations as a feed stimulant, anti-inflammatory and as an exercise recovery supplement.

Owners of professional race horses, companion pets, aquarium and aquaculture professionals from around the world are witnessing the results from the inclusion of Green Lipped Mussel Powder in all aspects of feeds, treats, supplements, attractants and baits improving taste profiles and delivering proven health benefits.

Animal and pet nutritional benefits include:

- natural anti-inflammatory
- rich source of Omega Fatty Acids and minerals
- pain reduction
- reduces stiffness in joints
- helps to maintain and sustain joints experiencing high physical burdens
- feed stimulant for sick or elderly animals

Historically, a special high-end equine formula was produced using the mussel meat and shell - which are high in calcium - and used in the feed for the foals, to develop a good, strong bone structure, and for optimum health in broodmares and race horses.
Green Lipped Mussel Powder contains betaine - aldehyde dehydrogenase, an enzyme that participates in metabolism. It is because of this enzyme’s action that the Green Lipped Mussel Powder acts as a feeding stimulant. Trial testing has shown that dogs and cats love the taste and smell of Green Lipped Mussel Powder. Its strong seafood odor acts as an attractant to the most finicky domesticated animals helping manufacturers to mask less desirable scents or flavors and to win taste tests by enticing animals to enjoy ingredients they would normally avoid. Green Lipped Mussel Powder is also used in cases where animals may be ill, elderly or suffering from loss of appetite.

The new processing technology developed by in our state of the art manufacturing facility allows the use of only pure fresh mussel meat to be extracted from the whole mussel (without the shell). A revolutionary freeze drying technology is then used to stabilize the lipids against rancidity. No heat is used during any process of the mussel powder production thereby eliminating any damage to the vitamins and amino acids in the mussels.

The Green Lipped Mussel Powder can then be mixed with Green Source Organic’s [flax seed products, natural apple, carrot, beet or other fruit and vegetable fibers] into a consistent powder and then extruded or pressed into pellets or pucks to produce solid, chewable treats used daily to enhance animal performance, nutrition and health.

**Dosage:** Suggested dose rate is 1,000 - 1,500 mg per day. It should be noted, however, that in some cases the benefits of taking Green Lipped Mussel Powder may take two to three months to become evident.