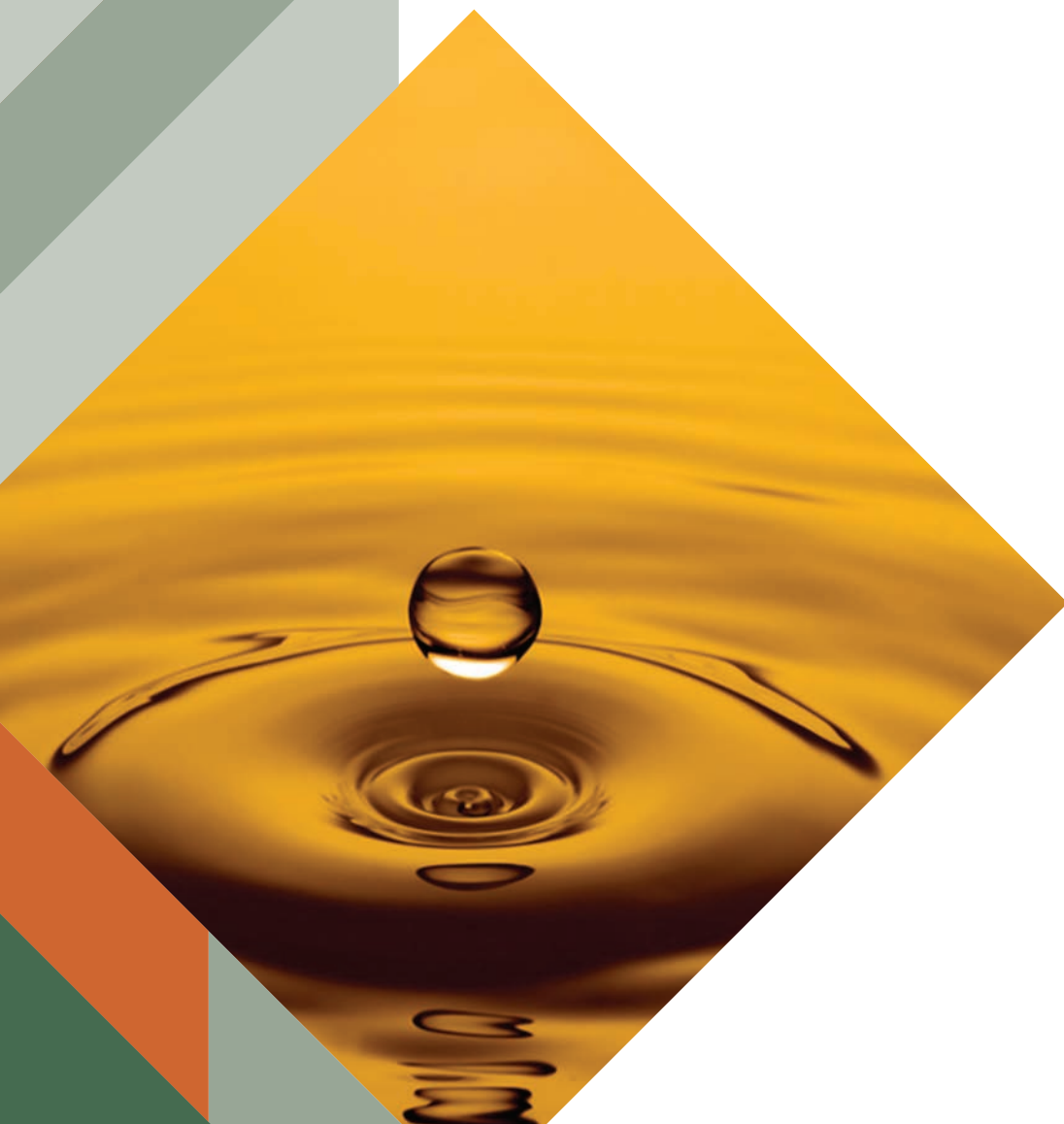


PernaTec® is a purified natural oil extract  
from New Zealand Greenshell™ mussels

**PernaTec**®  
GREENSHELL MUSSEL OIL EXTRACT



**WAITAKI  
BIOSCIENCES**  
A DIVISION OF PHARMAZEN LIMITED



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**PernaTec®**

is manufactured  
from sustainably  
farmed New Zealand  
Greenshell™ Mussels

### **Pure and Natural Oil Extract**

PernaTec® is a pure, clean and natural oil extract manufactured from 100% sustainably farmed New Zealand Greenshell™ mussels (*perna canaliculus*).

This species of mussel, a shellfish that is native and unique to the pristine sea waters of New Zealand, has been the subject of decades of research examining its health enhancing properties, many of which have been directly related to its powerful anti-inflammatory and anti-oxidant action.

### **Unique 3 Phase Lipid Profile**

Three main classes of naturally occurring lipid (triglycerides, phospholipids and sterols) combine together in PernaTec® oil extract, resulting in a unique, highly bioavailable ingredient with a range of nutritional benefits.

### **Omega 3 fatty acids from triglycerides**

One of three major lipid classes in PernaTec® oil extract, triglycerides and free fatty acids make up between 40% and 50% of the total lipid content with over 25 different fatty acids identified. Of these fatty acids, the long chain polyunsaturated fatty acids (PUFA) known as Omega 3's comprise a significant proportion.

Thanks to decades of international research the functional properties of Omega 3 fatty acids, particularly in the area of inflammation are widely understood. Clinical studies over this time have suggested potential benefits of Omega 3 oils for osteoarthritis, rheumatoid arthritis, heart disease, asthma and irritable bowel disease.

## **20% Omega 3 Fatty Acids**

### **Omega 3 fatty acids from marine phospholipids**

Phospholipids are another important source of Omega 3 fatty acids. Omega 3's from marine phospholipids have been shown to be better absorbed than from other oil sources and more resistant to oxidation<sup>1</sup> making them ideally suited for nutraceutical applications.



Phospholipids contain a diglyceride (glycerol group, with two fatty acids) and a phosphoric acid group, and are amphipathic in nature (containing both a polar and non-polar region), a chemical structure that gives the phospholipids particular functionality within cell membranes.

Much international research has been focused on marine phospholipids recently with promising results in the areas of inflammatory diseases, brain and heart health. In fact, the research around marine phospholipids is so exciting that they have been called "the new generation of Omega 3 lipids<sup>2</sup>."

Over 15 different phospholipids have been identified in PernaTec<sup>®</sup>

### 30% Phospholipids

#### Sterols

PernaTec<sup>®</sup> oil extract contains a wide range of sterols including the phytosterols sitosterol and methyl cholesterol, which are typically only found in plants. Phytosterols have shown blood cholesterol lowering activity in humans as well as anti-inflammatory activity<sup>3</sup>.

### Up to 5% Total Sterols

#### Carefully Controlled Manufacture

Manufacture of PernaTec<sup>®</sup> oil extract is tightly controlled throughout the supply chain.

We start by sourcing sustainable Greenshell<sup>™</sup> mussels of the highest export quality from approved suppliers whose marine farms and primary processing facilities meet strict government licensing criteria.

Freeze drying and further specialised processing to extract the oils is completed in our own purpose built manufacturing premises in Christchurch, New Zealand.

Our manufacturing premises are fully licensed with the New Zealand Ministry for Primary Industries (MPI) and operate an approved risk management programme (RMP) based on HACCP principles of food safety. Regular independent auditing ensures compliance of processes and procedures and enables us to manufacture a product of exceptional quality and safety.

PernaTec®

# Natural Anti-inflammatory Activity

Much of the research surrounding Greenshell™ mussel extracts focuses on the ability of the freeze dried product to reduce inflammation in animal models<sup>4</sup> and symptoms of inflammatory illnesses such as osteo and rheumatoid arthritis in human clinical studies<sup>5</sup>.

These research studies suggest that it is the naturally occurring Omega 3 fatty acids that have an important role in the anti-inflammatory activity of Greenshell™ mussels by effectively inhibiting eicosanoid biosynthesis.

Eicosanoids are involved in a wide range of cell signalling activities within the body, including inflammation. Pro-inflammatory eicosanoids (prostaglandins and leukotrienes) are derived from dietary long chain Omega 6 polyunsaturated fatty acids (PUFA). The Omega 3 fatty acids found in Greenshell™ mussel oil however have been shown to interfere with this process, resulting in down regulation of pro-inflammatory eicosanoid production<sup>6</sup>.

The carefully controlled PernaTec® manufacturing process extracts these anti-inflammatory Omega 3 fatty acids, resulting in a concentrated oil with a range of applications.

## PernaTec® Advantages

- Highly effective anti-inflammatory ingredient
- Rich in essential Omega 3 fatty acids, EPA & DHA
- Additional health benefits of phospholipids and sterols
- Sustainably farmed
- Non GMO
- 100% natural
- Fully traceable

## PernaTec® Profile

<b>Raw Material:</b>	New Zealand Greenshell™ mussels ( <i>perna canaliculus</i> ), sustainably grown in an aquaculture environment
<b>Physical Characteristics:</b>	Dark amber coloured liquid
<b>Packaging:</b>	Heat sealed foil bags inside sealed plastic pails
<b>Triglycerides and Free Fatty Acids:</b>	40% - 50%*
<b>Omega 3 Fatty Acids:</b>	20%*
<b>Phospholipids:</b>	30%*
<b>Sterols:</b>	1% -5%*

\* Typical values

<sup>1</sup> Burri, N., et al., Marine Omega -3 phospholipids: Metabolism and biological activities., International Journal of Molecular Sciences, 2012; 13(11): 15401-15419.

<sup>2</sup> Schneider M., Omega 6/3 fatty acids: Functions, sustainability, strategies and perspectives; Chapter 15; Marine phospholipids and their applications. : Next generation Omega-3 lipids. Edited by: F.De Meester et al;2013; DOI 10.1007/978-1-62703-215-5\_15;p.297.

<sup>3</sup> Navarro A., et al., Anti-inflammatory and immunomodulating properties of a sterol fraction from Sideritis foetens. Clin. Biol Pharm Bull., 2001; 24:470-473.

<sup>4</sup> Rainsford, K.D., Whitehouse, M.W., Gastroprotective and anti-inflammatory properties of green lipped mussel (*perna canaliculus*) preparation. Drug Research 1980; 30(II) Nr-12: 2128-2132.

<sup>5</sup> Gibson, R., et al., Perna canaliculus in the treatment of arthritis. The Practitioner Clinical Trials, 1980; 224: 995-958

<sup>6</sup> Slim G., Health effects of mussel extracts. Proceedings of the NZ Mussel Industry Council Ltd. Research Workshop. 1999; 4-11.