

Pacific Deep Ocean Concentrate, life's original source of minerals and trace elements

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Rehydrate and restore your minerals and trace element balance > We have rediscovered ionic concentrated minerals and trace elements from deep ocean water for your direct cell uptake. This translates into high bioavailability and more capacity to face physical and mental challenges with faster recovery phase. Anti-fatigue sports performance clinical trials already confirm statistically significant benefits from Deep Ocean Minerals against placebo. We hope this new ingredient has caught your attention. Now to the facts!

Historical use of Deep Ocean Minerals for holistic nutrition > Deep Ocean Water is a well-documented, safe, pure, stable and infinite resource with a high content of essential minerals and trace elements, including magnesium (Mg), calcium (Ca) and potassium (K), in their highly bioavailable ionic form. The east coast of Taiwan is directly adjacent to one of the largest reservoirs of accessible deep ocean water. The southern islands off Japan and Hawaii also have land access to Deep Ocean Water. Taiwan's east coast is ide-

ally located to siphon Deep Ocean Water directly to the surface from the coast. It is then micro filtered, followed by reverse osmosis to desalinate and concentrate the magnesium and other minerals and trace elements at the expense of sodium chloride.

Seawater has had a long history of therapeutic use, referred to as Thalassotherapy, originating from the Greek word thalassa. Both the Greeks and the Romans used the therapeutic effects of seawater for relaxation, regeneration and stimulation. Books on the healing power of seawater first appeared in the 17th century and until the early 20th century, seaside holidays were firstly therapeutic and secondly recreational holidays.

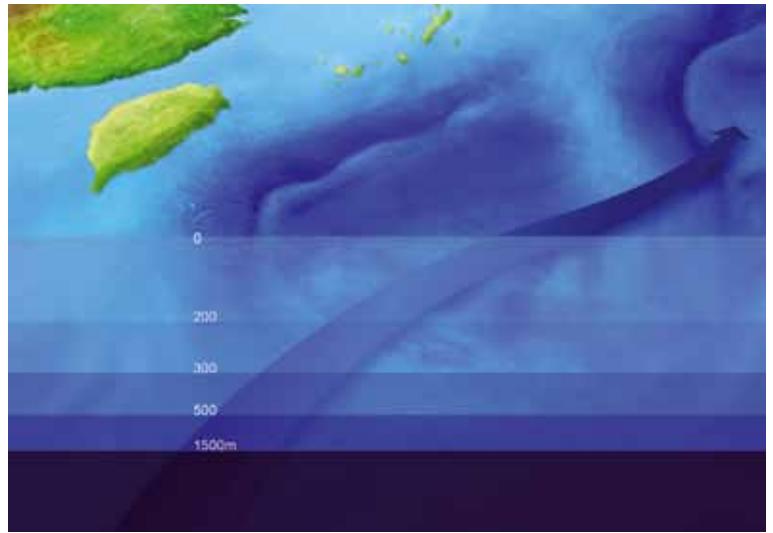
In 1897, René Quinton published the first comprehensive scientific thesis advocating the medical use of seawater in his book, “Seawater Organic Matrix, 1904”. He discovered the similarity between nutrient profile in ocean water and our blood nutrient profile. He noted that the ratios of minerals in both fluids were similar with the exception of sodium chloride, which he adjusted. Quinton selected seawater from regions which also contained micro algae. Today, we are able to access Deep Ocean Minerals and with new desalination technology, adjust mineral ratios to broaden and better target health applications.

Abbreviations:

1. DOW Deep Ocean Water
2. DOM Deep Ocean Minerals

Three separate ocean water layers > There are three distinctly different layers of ocean water. Each layer remains separate and autonomous from the others, moving at different speeds and directions from different kinetic forces and having different temperatures, densities and life form status.

The **Surface Seawater** layer is influenced by sunlight penetration and circulates rapidly in unison with the seasons and wind patterns to



a depth of 250 meters. It supports micro and animal life.

The middle layer termed **Deep Ocean Water** is free of sunlight and life forms. It is characterised by its mineral density, cold temperature, cleanliness and trace elements. It is present at depths of between 250 and 1500 meters. This deep ocean current moves very slowly under the influence of density and temperature gradients. The high mineral density is attributed to the depth related pressure and the change in temperature from 20 °C at the surface to 8 °C at 600 meters depth generates the movement of this layer.

Very Deep Ocean Water has been discovered in a number of troughs in the Atlantic and Pacific Oceans. Depths can range from 1500 meters to 15 kilometres and life forms are supported where inner earth core pipes bring heat and minerals to the seabed floor.

Our DOM ingredients are manufactured from the deep ocean layer and are sourced from a depth of over 650 meters.

We are discovering that Deep Ocean Water, due to its mineral and trace element density, can provide co-factors and catalysts for hundreds of necessary physiological processes that keep the body’s performance at its optimum, particularly when the body is being challenged physically or mentally. Over



the past 15 years, there have been many new publications establishing Deep Ocean Minerals as statistically significant with regards improved cardiovascular function. Recent clinical research from Taiwan, Japan and Korea also shows statistically significant therapeutic health benefits from either topical or oral consumption of Deep Ocean Minerals. This paper provides an introduction to recent research covering fatigue. This is a new opportunity for product innovation covering sports nutrition, rehydration and fatigue associated with work, high temperatures, travel and mental over activity.

The origin of life as well as our future has always been linked to the nutrient fertility of the oceans. The process starts with the summer ice melt from both Greenland and the Sub Arctic region as the melting water collects minerals and trace elements during its journey to the ocean. The minerals make the water heavier and hence, this water naturally sinks to the ocean floor where it commences a 2000-year journey. It flows southwards down the Atlantic Ocean, moves around the African Cape and then inches north through the Indian Ocean and also into the western Pacific Ocean, first coming close to land at Taiwan, then Okinawa and Hawaii and then arching back south, towards the Antarctica

where the changing sea water temperatures from the summer sun force the Deep Ocean Water to the surface to feed the largest micro and macro food chain on our planet.

Finding the mineral diet for optimum energy

– ATP > The human body constantly needs macro minerals and micro trace elements that can be found in Deep Ocean Water to maintain its energy management. We particularly need soluble minerals or electrolytes to help us maintain optimum cellular fluid levels and keep our body's pH in balance. Deficiencies in macro minerals and micro trace elements can lead to pre-mature ageing, immune dysfunction and susceptibility to cardiovascular related diseases. Regular dietary consumption of the optimum ratios of macro minerals can greatly increase vitality and one's quality of life.

Macro minerals and trace elements found in Deep Ocean Water have three important functions:

1. Provide the structure to our organs, tissues and bones – calcium, phosphorus, magnesium, fluorine, phosphorus and sulphur, all present in DOW.
2. The electrolyte form facilitates body fluid activity in tissues to maintain fluid balance, acid-base balance, membrane permeability, tissue irritability (including nerve transmission and muscle contraction) – sodium, potassium, chloride, calcium and magnesium in blood, all present in DOW.
3. Magnesium alone, catalyses over 300 enzyme and hormone reactions.

Fatigue Syndromes > We all experience periods of physical and mental fatigue. It is a normal result of working, mental stress, overstimulation and understimulation, jet lag or active recreation, depression, and also boredom, disease and lack of sleep. It may also be caused by mineral or vitamin deficiencies. Recent studies are showing that DOM could

help reduce the time and physical discomfort associated with fatigue.

In 2009, scientists at the National Taiwan Ocean University, Keelung, Taiwan, published the first notable wistar rat treadmill fatigue study. Researchers used desalinated Deep Ocean water, processed with ultrafiltration and reverse osmosis to increase magnesium levels and hardness. The water was sourced from the east coast of Taiwan. The study showed that the DOM experimental groups were significantly better than the control group with regards exhausting time and the ratio of lactic acid elimination to lactic acid increment. Summarising the results, the researchers suggested that endurance, adaptation for exercising load and accelerating elimination in fatigue of rats could be improved when fed with DOM of higher hardness and quantity¹. In 2014 scientists at

the Hung Kuang University, Taichung, Taiwan, published a gerbil animal trial, endorsing the findings of the wistar rat trial and again demonstrating that profiled Deep Ocean Water, significantly improved exercise performance in gerbils subjected to treadmill exercise².

In 2013, researchers at the department of Sports Sciences, Taipei University conducted a randomised double blind placebo controlled cross-over human study to evaluate the effect of Deep Ocean Water on time recovery from a fatiguing exercise conducted at 30 °C. DOM supplementation resulted in complete recovery of aerobic power within 4 hours. Muscle power was also elevated above placebo levels within 24 hours of recovery. Increased circulating creatine kinase (CK) and myoglobin, indicators of exercise-induced muscle damage, were completely eliminat-

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*Wegmüller et al.: Zinc Absorption by Young Adults from Supplemental Zinc Citrate Is Comparable with That from Zinc Gluconate and Higher than from Zinc Oxide. (Journal of Nutrition 144 (2) 2014)

ed by DOM in parallel with attenuated oxidative damage. Researchers concluded that the results provide compelling evidence that DOM contains soluble elements, which can increase human recovery following an exhaustive physical challenge³.

Conclusion > Deep Ocean Minerals provide a new dimension for improved performance by reducing fatigue. Formulators can choose from liquids of varying concentrations or powder.

There are further studies currently being conducted to confirm and understand the benefits of DOM to combat fatigue in its various forms. If you would like to receive a full list of DOM clinical trial publications and be advised of new publications, please contact the authors.

References >

Chien-Wen Hou, Yung-Shen Tsai, Wei-Horng Jean, Chung-Yu Chen, John L Ivy, Chih-Yang Huang and Chia-Hua Kuo. 2013. "Deep ocean mineral water accelerates recovery from physical fatigue." *Journal of the International Society of Sports Nutrition* 10:7 1-7.

MJ Sheu, PY Chou, WH Lin, CH Pan, YC Chien, Yi-Chung Chien, Yun-Lung Chung, Fon-Chang Liu and Chieh-Hsi Wu. 2013. "Deep Sea Water Modulates Blood Pressure and Exhibits Hypolipidemic Effects via the AMPK-ACC Pathway: An in Vivo Study ." *Marine Drugs* 11 (6) 2183-2202.

Shang-Ta WANG, Deng-Fwu Hwangi, Rong-Huei Chen, Yoo-ChiI Chen., 2009. "Effect of Deep Sea Water on the Exercise-Induced Fatigue of Rats." *Journal of Food and Drug Analysis, Vol. 17, No. 2, 133-141.*

Shin-ichiro KATSUDA, Takeshi YASUKAWA, Koji NAKAGAWA, Masao MIYAKE, Masao YAMASAKI, Kiyooki KATAHIRA, Motohiko MOHRI, Tsuyoshi SHIMIZU, and Akihiro HAZAMA. 2008. "Deep-Sea Water Improves Cardiovascular Hemodynamics in Kurosawa and Kusanagi-Hypercholester-

olemic (KHC) Rabbits ." *Biol. Pharm. Bull. Japan* 38-44.

Wang M.-L., Chen Y.-J., Cheng F.-C. 2014. "NIGARI (Deep Seawater Concentrate) enhances the treadmill exercise performance of Gerbils." *Biology of Sport, Vol 31 No1.* 69-72.

ZY Fu, FL Yang, HW Hsu, YF Lu. 2012. "Drinking Deep Seawater Decreases Serum Total and Low-Density Lipoprotein-Cholesterol in Hypercholesterolemic Subjects ." *Journal of Medicinal Food* 15 (6) 535-541.

¹Shang-Ta WANG 2009

²Wang M.-L. 2014

³Chien-Wen Hou 2013

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