

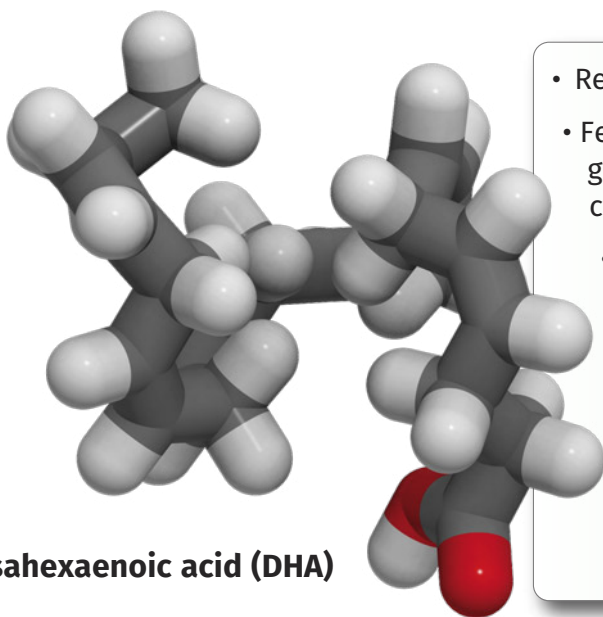
DHAgold[®]

**SUSTAINABLE ALGAE DERIVED DHA OMEGA-3
FOR COMPANION ANIMALS**





WHY DHAgold?



Docosahexaenoic acid (DHA)

- Reliable source of high quality DHA omega-3
- Fermentation derived product from algae grown consistently under controlled conditions
- Provides health benefits through all life stages
- Sustainably produced independent from fish sources
- Non-marine origin and free from ocean-borne contaminants
- Suitable for all common pet nutrition products

ABOUT DHA

NUMEROUS NUTRITIONAL STUDIES CONFIRM THAT BOTH, HUMANS AND PETS, FROM INFANCY TO ADULTHOOD TO SENIOR AGE, BENEFIT FROM AN ADEQUATE INTAKE OF DHA.

WHAT IS DHA?

DHA, or Docosahexaenoic acid, is a polyunsaturated omega-3 fatty acid found throughout the body. It is a major structural component of

Healthy brains contain about 60% structural fats and 30% DHA in the gray matter. DHA is the most abundant fatty acid in the brain representing about 95% of the total omega-3's.

brain tissue and the retina, a key component of the heart, located in healthy joints and plays a significant role in the control of multiple cell functions like inflammation or

immune response. DHA omega-3 is therefore essential for proper body function and considered the most important nutritional lipid in our diet.

NOT ALL OMEGA-3'S ARE EQUAL

Many pet food products claim to be a good source of omega-3 fatty acids, but not all omega-3's are equal. While DHA provides a broad range of health benefits, shorter chain omega-3's are mainly a source of energy. Additionally, shorter chain omega-3's do not efficiently convert to long-chain DHA in the body, partly because of the presence of omega-6 fatty acids competing for this conversion.

Therefore, the supplementation of a preformed source of DHA is the preferred nutritional strategy.

ALGAE AS A CONSISTENT SOURCE OF DHA

There are many ingredients that contain omega-3 fatty acids – but many of them are not adequate sources of DHA omega-3. For example, flax seed and vegetable oils are mainly a source of shorter chain omega-3's. Fish oils and fish by-products are the most common sources of DHA omega-3 used in pet nutrition products. However, the DHA content in fish can vary significantly dependent on fish species, geographical origin and the way the raw materials are processed and stabilized.

At this point modern biotechnology helps. Cultivating algae under controlled conditions provides a consistent alternative source of DHA-omega-3 which is unaffected by seasonal fluctuations, the availability of marine sources, any geographic variability or unwanted shifts in quality.



DHA OMEGA-3

BENEFICIAL THROUGH ALL LIFE STAGES



VISUAL DEVELOPMENT

A DHA enriched diet fed to dogs before whelping and during lactation allows puppies having a significantly improved DHA level in their retina, leading to improved visual performance in the developing dogs.

BRAIN DEVELOPMENT

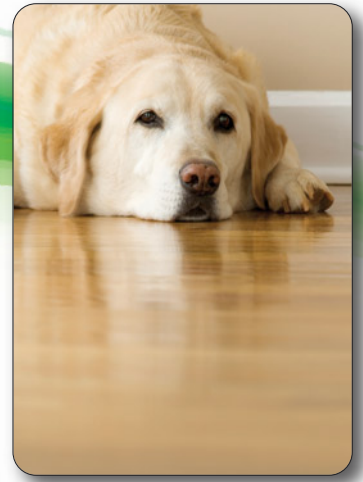
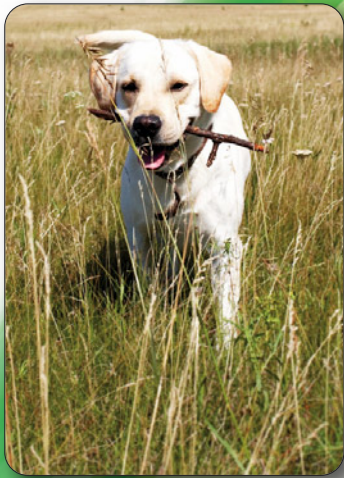
Feeding dams a diet enriched with DHA during gestation and lactation has been associated with improvements in the neurologic development of their puppies.

TRAINABILITY

Puppies nourished with high levels of DHA were found to be more trainable than puppies given low levels of DHA, supporting the effect of DHA on neurological function.

IMMUNE AND INFLAMMATION RESPONSE

Supplementation with omega-3's positively influences the cell-mediated immune response. In dogs DHA supports anti-inflammatory effects along with positive effects on immune function.



HEART HEALTH

DHA is beneficial in dogs with cardiac disease and support anti-arrhythmic effects along with positive effects on heart rate and blood pressure.

MEMORY AND VISUAL PERFORMANCE

A DSM study showed that a group of 8 to 11 year old dogs fed food containing DHAgold for 6 months had significantly improved memory and visual performance.

SKIN AND COAT CARE

Dogs with canine pruritic skin disease, supplemented with DHA, showed significant improvements in skin health and coat character over time. The quality of a dog's paw pad is also linked to its DHA nutritional status. Dietary omega-3 supplementation is useful in the treatment of feline skin disorders including miliary dermatitis.

DIGESTION AND GUT HEATH

Omega-3 fatty acids help decrease intestinal inflammation.

METABOLIC SYNDROME

Management of hyperlipidemia in dogs can be achieved through low fat diets also providing DHA as a lipid lowering agent. In obese cats diets high in omega-3 fatty acids may improve long-term glucose control and decrease plasma insulin concentration, reducing the risk of developing diabetes mellitus.

MOBILITY AND JOINT CARE

In dogs with osteoarthritis, omega-3's help reducing the use of pain medication required. Omega-3 fatty acid supplementation can also lead to an improvement in weight bearing for dogs with osteoarthritis.

DHAgold – A SUSTAINABLE

GROWING DEMAND FOR FISH MAY SOON OUTSTRIP SUPPLY

While the global population has swelled to more than 7 billion people, the world's natural resources are considered nearly static. The ever increasing global consumption of fish, and our heavy reliance on fish material as a protein source, is bringing us to the critical point where ocean supplies will fail to meet the

From a 2015 U.S. survey, 64% of pet owners are concerned we are overfishing the oceans

growing demand. Since ocean fish is a critical food component in the aquaculture industry, farm raised fish will not alleviate the pressure.

Projections indicate that continuing to overfish our oceans will result in a shortage of commercially harvested fish and potentially lead to extinction of certain species.

THERE IS A PRESSING NEED FOR ALTERNATIVE SOURCES OF DHA OMEGA-3

A factor in the recent surge in the popularity of fish products, both as a supplement and dinner staple, is the consumer recognition of the important health benefits of omega-3s. Due to the uncertainty surrounding this traditional source of dietary DHA omega-3, the quest to determine a sustainable alternative is underway.

DHAgold FROM ALGAE PROVIDES A SOLUTION

Most people believe that fish produce their own DHA, when in fact it is the algae in their food chain that makes them a rich source of DHA. Algae are consumed by plankton which the small fish eat, then larger fish feed on the smaller fish, a process that transitions the DHA from the algae to the fish we eat.

Being based on algal fermentation, **DHAgold** bypasses the fish and goes directly to the source. Because **DHAgold** gets its DHA from algae and not fish, **DHAgold** is a consistent, sustainable, none marine source of DHA which is free of ocean-borne contaminants.



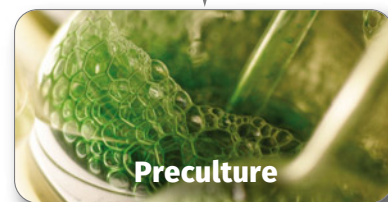
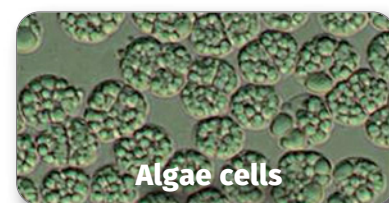
OMEGA-3 SOLUTION

MAKING DHAgold

Algae have many biochemical pathways distinct from plants, animals, fungi, and bacteria that represent a virtually untapped genetic resource that can greatly benefit human and animal health. What began as a study on the beneficial use of algae in long-term space flight resulted in the identification of strains of algae that were naturally high producers of DHA.

The DHA-producing algae are grown in large, stainless steel fermentation vessels commonly used in the pharmaceutical and food industries via a closed process in cGMP, FDA-inspected facilities. After fermentation, the algal biomass is carefully dried to produce **DHAgold**. These microalgal flakes contain a high

level of DHA ideal for use in pet nutrition products. The natural protection of the cell walls and the additional natural antioxidants create the stability needed for a longer shelf life. Because it is a whole cell algal, **DHAgold** has better sensory performance compared to fish oil and fish meal.



PRODUCT PROFILE DHAgold S17-B

Source	Whole cell <i>Schizochytrium</i> sp. algae
DHA content	Minimum of 17% DHA (total fat content \geq 40%)
Appearance	Golden brown flakes
Preservative system	Lecithin, rosemary extract, mono- and diglycerides, citric acid
Nutritional density	580 Kcal/100 g
Application	Suitable for all common pet nutrition products Applicable for vegetarian and vegan pet nutrition products
Shelf life	18 months
Packaging	15 kg/bag, 50 bags/pallet (750 kg)



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