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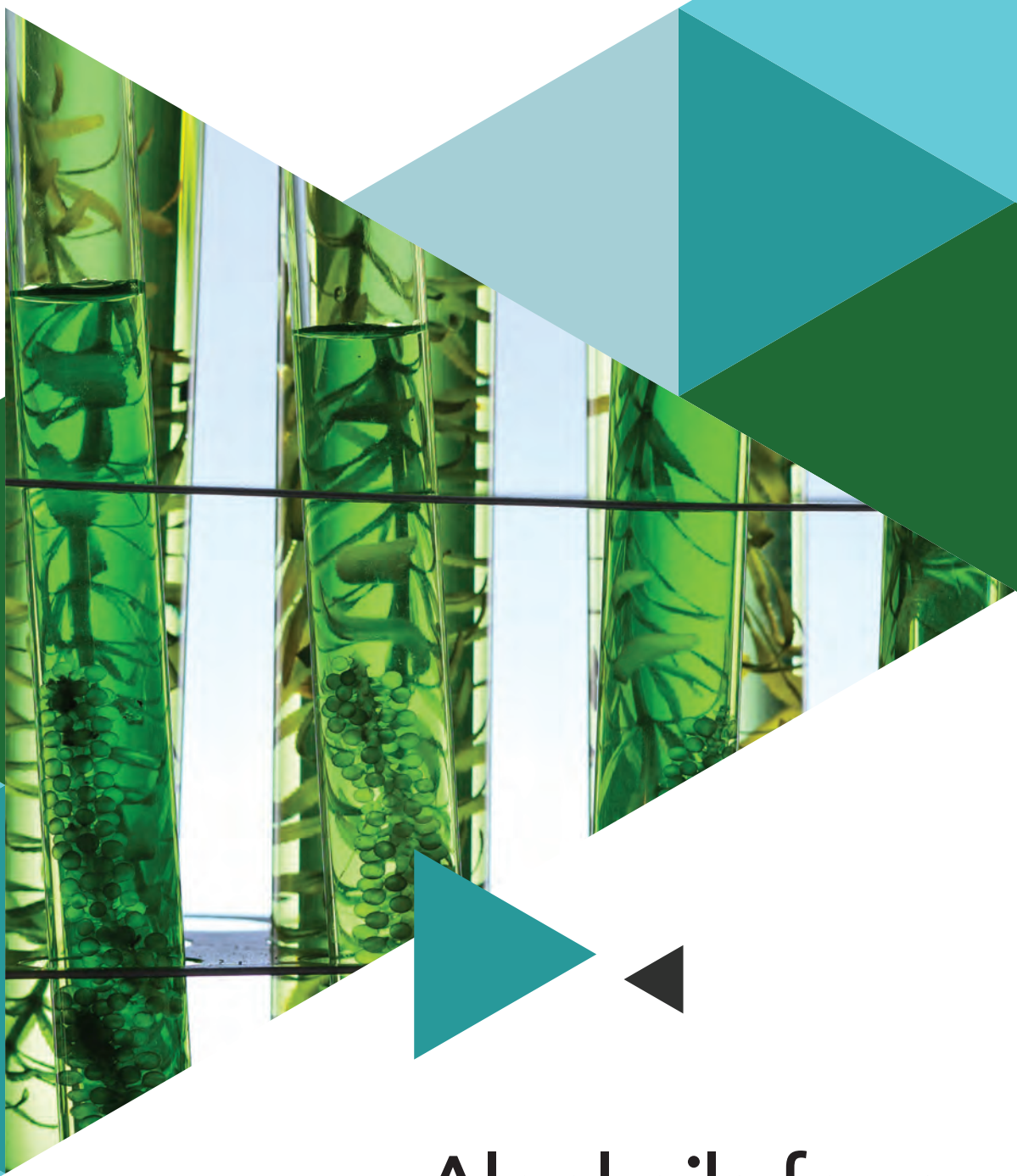

Algal oils for a cleaner, sustainable alternative

Progress Biotech

High-quality biotech products for food, nutraceutical and pharma applications

OMEGA 3

Decades of research have supported the many health benefits of Omega 3 fatty acids. Several health claims are defined by EFSA and they support the positive effect of Omega 3 fatty acids. Algal oil has a high concentration of Omega 3 and especially of DHA, one of the most important Omega 3 fatty acids.

Our products are made by fermentation of algae of the species Schizochytrium.

Algae oil

PURE

free of odour

flavour

Our products are made in Europe to the highest standards available and have an excellent flavour and odour profile.

FULL Traceability

From the starting culture of fermentation to the final product all steps of the process can be traced, monitored and if required audited.

HEALTH DHA™

DHA powder

Encapsulate

10% DHA

For the application of algal oil in food the oil can be encapsulated. This process results in a highly stable, food grade, free flowing powder that can easily be mixed with other ingredients. Our Encapsulate contains 10% Vegan DHA concentrate.

HIGH CONCENTRATE

70%

80%

40%

Standard WINTERIZED

50%

HALAL

FOOD SAFETY SYSTEM DNV·GL ISO 22000

FDA

VEGAN

Progress Biotech

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In the name of progress

The food, nutraceutical and pharmaceutical markets are all eagerly searching for innovations in health, omega-3 and fortified-food-based products. Such innovations come in a wide range of forms, but the most successful move in step with changing customer and consumer demands to match dietary requirements and lifestyle choices, such as veganism.

High-DHA algal oil, free of odour and taste

After years of development, **Progress Biotech** is supplying a zero-flavour and taste high-docosahexaenoic-acid (DHA) algal oil to the global market. This opens up possibilities for product development teams around the world to create innovative products for a demanding market.

The benefits of omega-3 are becoming increasingly well known, with over 22,000 scientific studies published on its uses. Traditional high-omega-3 oils from fish, krill and algae are available on the market, all with specific applications..

The European Food Standards Agency (EFSA) generally recommends consumption of 250mg of omega-3 – eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) – a day to maintain general health and well-being. DHA-specific health claims supported by EFSA are:

- DHA contributes to the maintenance of normal brain function (250mg/day)
- DHA contributes to the maintenance of normal vision (250mg/day)
- maternal DHA intake contributes to normal brain development of the foetus and/or breastfed infant
- DHA intake contributes to normal vision development of infants up to 12 months (100mg DHA/day).

In other markets, similar or higher daily dosages are recommended by authorised bodies.

High-DHA oils – in high demand

Over the past few years, the demand for high-DHA oils combined with a minimal smell and odour footprint has been growing. Such products would expand the field of oil application and present new opportunities to product development teams. The availability of such products would also enable more creative and niche-oriented companies to develop products for new markets.

Progress Biotech has successfully combined a pure and stable algal oil product with the best available refining and processing techniques, resulting in a flavourless and odourless high-DHA algal oil. Algal oil that is free of odour and flavour opens up a whole new range of applications that were previously off limits for traditional omega-3 products.

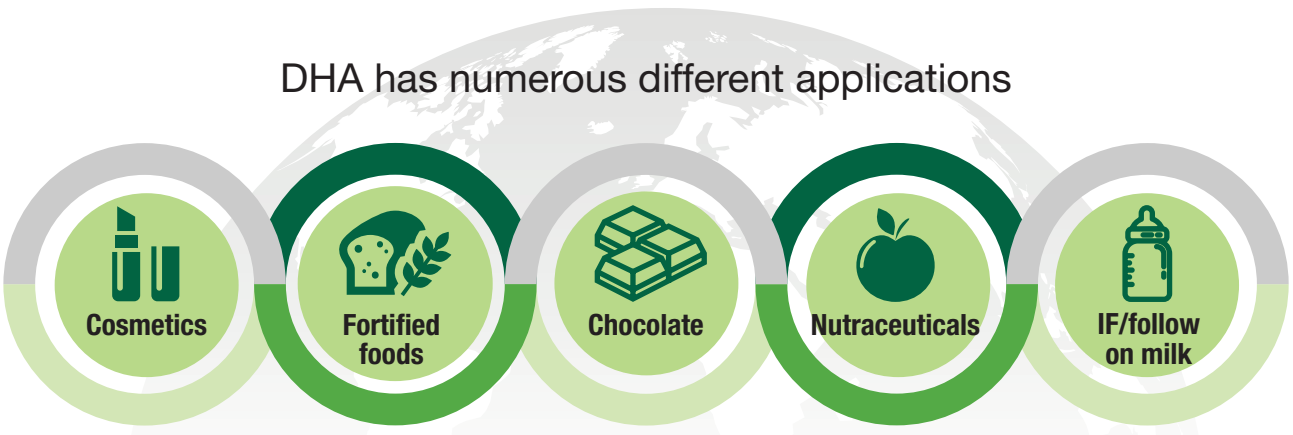
This oil can be incorporated in a variety of delivery systems that are off-limits for traditional omega-3 oils, such as gummies, chewables and direct-intake emulsions. In addition to the use of oils, encapsulated products are available when dry-mixing of ingredients is required.

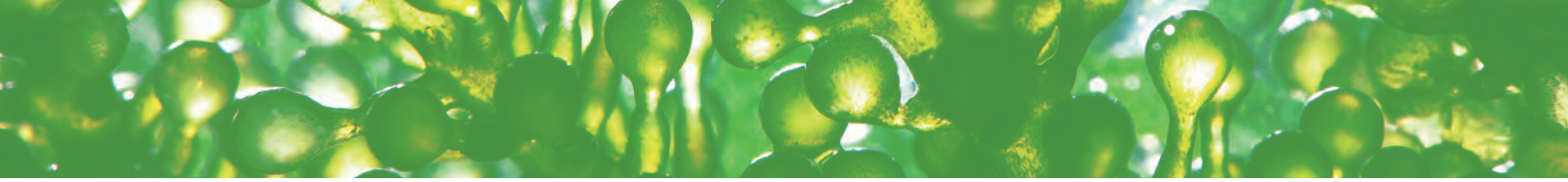
Compared with traditional pills and capsules, supplements in the form of gummies can be more appealing and convenient. The chewiness and flavourings (such as orange, cherry and raspberry) make them attractive to children and adults alike.

Progress Biotech's own quality-assurance methods guarantee superior standards and specifications that stand out in this rapidly developing market.

Product characteristics include:

- high DHA concentrations of 40–80% in ethyl ester (EE) and triglyceride (TG)
- flavourless and odourless oil
- special winterisation ensures clear oil
- vegan, kosher and halal-certified
- full traceability from fermentation to final product
- no solvent extraction.





This flavourless, odourless algal oil is available in commercial quantities and customer feedback suggests this is probably the best high-DHA algal oil on the market. Progress Biotech's client support specialists advise manufacturers in food, nutraceuticals, cosmetics and pharma on existing and new applications.

Encapsulates and powders

Because of the excellent characteristics of the oil, the encapsulate also has outstanding features.

The dissolution of DHA-containing powders is an important quality characteristic. If the product takes too long to dissolve or requires effort for the consumer to mix, it will give a negative impression. The right product needs to dissolve easily, preferably without mixing. In a successful production process, the free-fat content will be very low, enabling the powder to dissolve without stirring, even in relatively low-temperature water.

Progress Biotech conducted a test using its 10% powder to determine the relationship between the temperature of the water and the time to dissolution (see graph, below).

For this test, 7.5g of the powder was added to 400ml of water in a laboratory beaker. The time between the moment the powder was added to the water and the moment all the powder was below the surface of the water was then measured. After the powder was put on the surface of the water, no effort was made to dissolve the powder. The experiment was repeated with water of different temperatures, ranging 10–70°C.

The experiment yielded the following results:

- at all temperatures tested, the powder dissolves in the water without stirring
- the free-fat content is sufficiently low to result in auto-dissolution
- an increase in temperature accelerates the dissolution – the time it takes is reduced by 50% when the temperature is increased from 10°C to 70°C
- the powder dissolves effortlessly even in 10°C water.

Scan the QR code to see a video impression of the encapsulate dissolution.

Traceability concerns

Current discussions on the traceability of omega-3 products have revealed the sensitivity of complicated supply chains. The risk of accidental or intentional adulteration multiplies with each step, especially when many companies are involved. Progress Biotech can support full traceability of its products, from fermentation of the biomass to the final product.

Launch into action

Progress Biotech has recently launched a new website – www.healthdha.com – which aims to provide business developers with scientific benefits and information on DHA. The company's scientists (medical doctors, biochemical doctors and such) are deeply involved with the developments on DHA and health. They supply Progress Biotech with relevant information, new studies, new WHO recommendations and other available materials, which the company publishes or links on the website. With the help of www.healthdha.com, business developers can easily look up the relevant information instead of having to spend hours surfing the internet, combing through advertisements. ●

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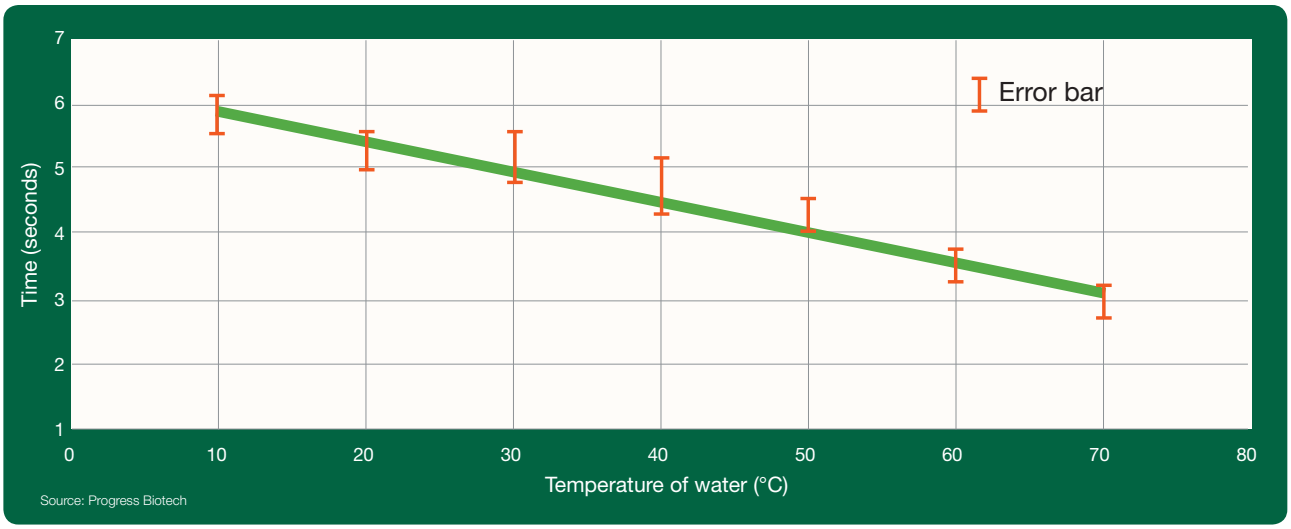
Dissolution speed of 10% DHA powder



Algal oils – a cleaner, sustainable alternative

As demand for omega-3 rich supplements continues to grow, **Progress Biotech** has created a range of algal oils that provide consumers with a cleaner and sustainable alternative to traditional fish oils. Jaap Peters, CEO and founder of the company, discusses the merits of this innovative approach.

Since the 1970s, when Danish researchers Hans Olaf Bang and John Dyerberg published studies connecting the low rate of heart disease among Inuit residents in Greenland to their oily diets, fish oil supplements have become a major health supplement.

Even so, these products have their drawbacks. Most krill and cod liver oil supplements are strongly flavoured, and not suitable for vegetarians and vegans. Progress Biotech has addressed this problem by extracting the omega-3 fatty acid docosahexaenoic acid (DHA) from algae, producing a flavourless, colourless and vegan-certified alternative to rival fish oils.

Through its innovative extraction practices, Progress Biotech produces algal oil from the species *Schizochytrium*, without using any solvents. The company then refined and concentrated the oil according to EU standards. This method results in a pure, very stable oil, rich in DHA, which is available in a range of concentrates of 40–80% DHA.

The search for sustainability

For Jaap Peters, founder and CEO of Progress Biotech, the decision to move towards algal oils was triggered by a more sustainable approach to food. "These days, we need to be careful what we do and what we eat," he says. This move was spurred by two main factors – an awareness of the decreasing volume of fish in the ocean and a sense that completely clean fish are hard to come by.

Progress Biotech's move towards algal oils was triggered by a more sustainable approach to food.

"We have taken that requirement for fish oils," he says, "and asked, 'can we find a different way to make these fatty acids without using fish waste as a source'."

Speaking of the various clean standard organisations in the fish oil market, Peters is sceptical as to whether fish can ever be fully classed as 100% clean.

"Even if you know where fish are caught, you can not be sure where the fish has been or what it has been feeding on," he says. Contaminants and pollutants accumulate in the food chain and will remain present in the fish oil.

The greater awareness of how fish and marine organisms are contaminated is supported by evidence from increasingly sophisticated analysis techniques. Many of the chemicals accumulated in the food chain of the fish are very persistent and should be avoided.

"For Progress Biotech," says Peters, "algal oil production is an obvious way to bring a new type of plant-based omega-3 product to the market, ensuring that customers get a high-quality and ultra-clean product.

"It is the ideal alternative to fish oils – it's much cleaner," he continues. "We can trace the produce all the way back to the first cultivation. We grow it in stainless steel tanks instead of open ponds. So we meet all the highest standards of nutrition."

Progress Biotech's founder is quick to clarify that algal oils aren't just for vegans; rather, they satisfy a more widespread approach towards conscious eating. "Lots of people are debating the carbon footprint that is associated with meat," he says.

The commercial opportunities that come with developing a more palatable product are also an exciting factor for Peters, and look set to shape his company's future aspirations for years to come.

"The oil has no flavour or odour," he says. "This opens new possibilities for product development in food bars, nutritional products, yogurts, drinks and so on. You can make powders with it, you can combine it in infant formula and follow on milk. There are lots of possibilities."

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