NT Mega Ingredients Delivering Active Nutrition

The Good Oil

Ultra-high EPA and DHA powders are powering new markets for Nu-Mega Ingredients

NUMega

Nu-Mega Ingredients' development of ultra-high EPA and DHA microencapsulated powders is driving growth in major international segments including Foods for Special Medical Purposes (FSMP), sports nutrition and general nutraceuticals which can increase immunity.

"Our ultra-high EPA and DHA powders enable food and beverage manufacturers to increase the amount of Omega-3 fatty acids to extremely high levels without compromising on sensory aspects such as taste and smell," says Peter Davey, CEO/MD of Clover Corporation, Nu-Mega's parent company.

"We saw a lot of interest from the FSMP segment at a recent China trade show. Enquiries are also strong from manufacturers of products which can help boost immunity and lower inflammation, from manufacturers of sports nutrition products including beverages and protein bars and from those manufacturing products for the vegan and vegetarian market." (See stories this issue).

There's a growing body of nutrition research linking EPA and DHA with a healthy immune system. As the fatty acid composition of inflammatory and immune cells is sensitive to change according to diet, researchers showed that an increased oral supply of the fatty acids EPA and DHA increased the amount of these fatty acids in human immune cells.

High DHA sports nutrition bars and beverages are also finding favour with elite athletes who are increasingly seeking nutrients and approved supplements that can



"The powders are three times more potent than others in the market, enabling higher fortification rates of up to 500 mg of DHA per serve." Peter Davey, CEO

improve performance. Studies over the past decade show that DHA has many beneficial impacts on muscle condition, metabolic capacity, exercise recovery, cardiac function and oxygen consumption.

Nu-Mega's ultra-high Omega-3 microencapsulated products are: Driphorm[®] High EPA 275, the non-protein Driphorm[®] High EPA 250, Driphorm[®] HiDHA 360 from fish oil, vegetarian option Driphorm[®] SCO DHA-S 50 and vegan option Driphorm[®] HA HAD-S 30.

Nu-Mega increases R&D capability with new Brisbane premises

Nu-Mega's widely acknowledged product innovation has received a major boost with the opening of new Brisbane premises which will deliver an increased R&D capability, particularly for in-house pilot-scale projects.

"The new premises will allow us to fast-track new product development and do more of it, while having more security and control over product development," says Peter Davey, CEO/MD of Clover Corporation, Nu-Mega's parent company. "Our spray drying capacity has also progressed from a desk-top version to a pilot production size version, which will help us with process design of new products."

The premises include offices and a large meeting room upstairs, with downstairs comprising an analytical/applications laboratory, sensory analysis room, meeting rooms and a wet processing module. The laboratory is more than double the size of the previous facility.

"The move to a new site has given us increased capacity for testing and application development purposes, but the main objective was to incorporate pilot scale R&D equipment that will allow us to do the larger scale R&D production runs which we previously outsourced," says Glenn Elliott, Nu-Mega's Research, Quality and Regulatory Manager.

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"We have several R&D projects which are ongoing, but we will have the capabilities of conducting more trials because we have in-house equipment. This is a completely integrated and automated R&D processing setup," Mr Elliott says.

The pilot spray dryer will enable 10kg to 20kg production batch sizes to be produced.

The new premises are in Eight Mile Plains, close to Nu-Mega's previous location.

Study of Omega-3 supplementation shows ready acceptance by children

There's mounting evidence to show that DHA is an essential ingredient in supporting early childhood functions such as normal brain and vision health and development.

However, supplementation with Omega-3 fatty acids must be easy for researchers to administer and readily accepted by children says Dr Samaneh Ghasemi Fard, Research Liaison Officer at Nu-Mega Ingredients.

"Researchers from the University of Wollongong's School of Medicine, Faculty of Science, Medicine and Health investigated the feasibility of a protocol to determine whether Omega-3 fatty acid supplementation improves selfregulation in preschool aged children^[1].

"Supplement palatability is one of the concerns for the feasibility, and for the completion of the study when implemented into a group of children or patients with specific medical conditions," Dr Fard says.

Researchers found a total of 59% of parents reported that their child liked the supplements, with no significant difference between the two groups in the study. Furthermore, 79.3% parents believed the supplements were easy to administer ^[1].

The "Omega Kid Study" was the first study to use Nu-Mega's microencapsulated tuna oil powder (Driphorm[®] HiDHA[®] 50) in preschool-aged children.

Nu-Mega Ingredients provided microencapsulated tuna oil powder (Driphorm[®] HiDHA[®] 50, containing 11.6% w/w DHA and 2.7% w/w EPA) to the researchers. The trial powder delivered 1.3 g of DHA and 0.3 g of EPA per day, whilst the placebo powder contained an equivalent amount in weight of high oleic acid sunflower oil instead of the n-3 LCPUFA fish oil. Both powders were supplied in a vanilla-flavoured powder in individual sachets. Researchers were advised to ask participants to prepare samples on a daily basis by mixing an individual sachet into either warm milk or vanilla yoghurt.

A number of interventions have been carried out in children and adolescents (aged 2 to 17 years) to improve self-regulation and executive function. The majority of these interventions have shown improvements in self-regulation and also beneficial effects in distal outcomes such as academic achievement, substance abuse, conduct disorders, social skills, depression, behavioural problems and school suspensions ^[2]. However, such interventions are resource-intensive and difficult to disseminate widely and therefore not feasible for large cohorts ^[1].

The stability and bioavailability of microencapsulated tuna oil powders (Driphorm[®] HiDHA[®] 50) has been previously investigated in healthy toddlers compared with high DHA fish oil for a one-month period and was assessed from both blood and faecal fatty acid levels ^[3]. Results obtained from the toddler study strongly support the bioavailability and digestion of microencapsulated tuna oil, therefore the administration of this form of Omega-3 is highly recommended for the feasibility of clinical studies.

Nu-Mega Ingredients is internationally recognised for its collaboration with research institutions into the scientifically validated benefits of high DHA fish oil. For published human clinical trials, Nu-Mega Ingredients has also been the largest supplier of high DHA fish oil supplements over the past two decades and has provided researchers with supplements in the form of either fish oil capsules or emulsion ^[4].

Although fish oil can be provided for future studies, Nu-Mega Ingredients also offers researchers microencapsulated DHA fish oil, EPA fish oil and algal DHA oil powders. All have a remarkable 24-month shelf life at ambient temperatures and higher active levels with no negative sensory impact. Research enquiries can be sent to samanehf@nu-mega.com.

[1] L.A. Roach, et al. The feasibility of the "Omega kid" study protocol: A double-blind, randomised, placebo-controlled trial investigating the effect of omega-3 supplementation on self-regulation in preschool-aged children, Nutrients 13(1) (2021) 213. [2] A. Pandey, D. et al. Effectiveness of universal self-regulation-based interventions in children and adolescents: A systematic review and meta-analysis, JAMA pediatrics 172(6) (2018) 566-575. [3] S. Ghasemi Fard, et al. Microencapsulated tuna oil results in higher absorption of DHA in toddlers, Nutrients 12(1) (2020) 248.
[4] S. Ghasemi Fard, et al. How does high DHA fish oil affect health? A systematic review of evidence, Critical reviews in food science and nutrition 59(11) (2019) 1684-1727.

Demand grows for supplementation with high DHA plant-based powders

The global plant-based market continues its solid growth, as consumers turn to foods which can lower the risk of heart disease, hypertension, Type 2 diabetes, obesity and some cancers.

Alpha linolenic acid (ALA) is the major plant-based Omega-3 long chain polyunsaturated fatty acid and is the metabolic precursor of EPA and DHA. In humans, the conversion from ALA to EPA and DHA appears to be very ineffcient. To achieve an adequate level of Omega-3 for the maintenance of good health, consumption of fish and fish oils (the most concentrated sources of EPA and DHA) is recommended.

But when people on a 'planet-friendly' diet eliminate all animal products, the lack of fatty seafood means vegans and vegetarians are also eliminating their primary sources of the essential Omega-3 DHA and EPA and are likely to be at risk of low or inadequate Omega-3 levels. The Food and Agriculture Organization of the United Nations and The European Food Safety Authority recommend a daily intake of 250 mg of DHA in combination with EPA for adult males and non-pregnant/non-lactating adult females, and a minimum daily intake of 300 mg EPA plus DHA for pregnant and lactating women, with at least 200 mg being DHA.

The American Heart Association recommends about 1 g per day of EPA plus DHA for patients with known coronary heart disease, and 2 to 4 g per day for patients needing triglycerides lowered.

"Vegans and many vegetarians won't use DHA supplementation from fish oil. Their search for vegan alternatives has resulted in Nu-Mega Ingredients' algal oil DHA powders becoming the company's fastest growing product segment in 2019/2020 globally," says Bassam Hallak, Nu-Mega's Global Business Development Manager.

Nu-Mega Ingredients offer both the vegan option Driphorm[®] HA DHA-S 30 and vegetarian option Driphorm[®] SCO DHA-S 50.

Nu-Mega's patented microencapsulation technologies protect sensitive Omega-3 oils from oxidation and provide a best-inclass sensory outcome for manufacturers wanting to achieve high fortification levels in a wide variety of applications including baked goods, beverages, dry blended powders and products requiring high temperature processing.

Please contact Nu-Mega Ingredients for product flyers on plant-based powders.

Nu-Mega exclusive presenter on DHA/ARA at China conference

Nu-Mega's high level of expertise in microencapsulated DHA and ARA was recognised in China when the company was the sole invited presenter on encapsulated DHA and ARA at a forum earlier this year.

Organised by the Chinese Infant Formula Manufacturers' Association, the forum was held to assist manufacturers whose products are required to meet new regulations on the addition of minimum levels of Omega-3 fatty acids DHA and ARA to infant formula sold in China.

Over 20 infant formula manufacturers in northwest China sent more than 160 delegates to listen to presentations which included 'High DHA/ARA solutions to solve the new GB high DHA/ARA challenge' presented by Harry Wang, Nu-Mega's Business Development Manager for China.

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He was joined at the forum by Emma Li, Nu-Mega's Commercial Head in China.

Mr Wang highlighted Nu-Mega Ingredients' worldrecognised microencapsulation technology, including high potency products, outstanding sensory performance and maximum bioavailability of DHA/ARA. High DHA/ARA formula prototypes were sampled, and technical advice given on testing DHA/ARA in infant formula products.

Nu-Mega Ingredients' DHA and ARA microencapsulated powders have up to double the potency of comparable products, with no sensory impact.

Fortification in China is still optional, however from February 2023 the minimum level will be 15mg of DHA / 100 kcal for formulas for infants aged 0-6 months and 6-12 months, with a maximum of 40 mg / 100 kcal. ARA is required at equal levels to DHA and up to a maximum 2:1 ratio.

These new standards follow similar changes to the EU infant formula regulations which came into play in February 2020.

Nu-Mega Ingredients

Nu-Mega[™] Ingredients is a wholly owned subsidiary of publicly-listed Australian company, Clover Corporation. It specialises in the manufacture and supply of Omega-3 DHA and Omega-6 ARA powders, the nutritional ingredients which are added to infant formulas, general foods and nutraceuticals.

Clover Corp has a tuna oil refinery in Melbourne, where it takes crude tuna oil from various supply sources and converts it into a food and infant grade quality tuna oil.

Nu-Mega's spray dried microencapsulated powders use a CSIRO patented technology to stabilise the sensitive Omega-3 and Omega-6 oils which can then be dry blended into a variety of foods, beverages, infant formulas and nutraceutical products. The oils can be heated with no impact on product smell or taste, and have a shelf life of two years.

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Nu-Mega attends its first Food Ingredients China trade event

Food Ingredients China (FIC) is one of the world's largest trade shows in its sector, this year attracting some 1500 exhibitors and 50,000 visitors despite the global impact of COVID-19. Nu-Mega booked its first-ever stand at FIC and had appointments with around 40 existing and potential customers during this June event.

Emma Li, Nu-Mega's Commercial Head in China, says there was great interest in products including high EPA D013 and concentrated fish oil DHA D307.



"We had a number of FSMP (Foods for Special Medical Purposes) customers visit us and request samples of high EPA and tuna DHA for trials. A month later, one then ordered 20kg for a production trial," she says.

This market is experiencing rapid growth in many countries due to increasing recognition of the importance of nutritional support and dietary management for people with certain diseases, medical conditions or health disorders.

FSMP can only be accessed via medical practitioners, dieticians or pharmacists.

While visitor numbers were fewer than in previous years because of COVID-19, those who met with Nu-Mega were high-value visitors.

The company plans to attend FIC in 2022. This annual trade event covers all fields of the food industry, including novel foods and ingredients, food-related packaging materials and machinery, test equipment and manufacturing techniques. Exhibitors and customers attended from 33 countries and regions around the world this year.



