

# The Good Oil

NOVEMBER 2018

## New Zealand investment boosts spray drying capacity for Clover Corp

Clover Corp will significantly increase its spray drying capacity in New Zealand through the acquisition of a 35% stake in a new company, Melody Dairies, based at the Waikato Innovation Park in Hamilton.

The company is owned by four partners: New Zealand Food Innovation Waikato, (NZFIW) 10%, Dairy Nutraceuticals Investment Limited (DNL) 20%, Landcorp Farming Limited (LFL) 35% and Nu-Mega Ingredients™ (NZ) Limited (NMI) 35%. NMI is wholly owned by Clover Corporation Ltd.

“The partnership in Melody Dairies is an extension of the relationship Clover has had with NZFIW since 2014, when we invested in the first spray dryer built at Waikato,” says Peter Davey, Clover Corporation’s CEO and Managing Director.

The new spray dryer, which will be owned by the partners in Melody Dairies, will augment the capacity of Clover to manufacture its specialty micro-encapsulated powders for the infant formula, pharmaceutical, nutraceutical and food markets.

“The investment reflects the increasing demand for Clover’s products, with sales growing by more than 20% annually over the past four years,” Mr Davey says.

Clover Corp has a range of patented micro-encapsulated products created through the spray drying process, all of which contain omega-3 oils. These products are recognised in the infant formula sector as best in class for delivering high levels of DHA (a key component in omega-3 oils) with no sensory issues of taste or smell and a two-year shelf life without refrigeration.

These are attractive features for infant formula manufacturers who need to ensure the high quality of their products. Governments are increasingly legislating for DHA in infant formula to match the naturally occurring levels in breast milk.

DHA is clinically recognised as a required nutrient for normal brain, eye and cardiovascular function, and is also

being used to fortify foods targeting sports, children and seniors’ nutrition to support cognitive and physical performance.

“The acquisition of a significant share in Melody Dairies reflects the company’s strategy of vertically integrating its supply chain. This will reduce the risk of product supply disruption which could result from problems of availability or quality at other facilities, and allow for expansion of the supply chain to meet new opportunities,” Mr Davey says.

Since its 2014 investment at Waikato, Clover has increased its production well beyond the original contracted volume, as it has at its alternative manufacturing facilities. The strong relationship with NZFIW has made the new partnership a logical choice for further investment.

Melody Dairies will be managed by the existing NZFIW facility team and board. Clover Corp has invested in the business through debt funding, with the factory being built over the next two years.



*Paul Sherman, Chief Financial Officer of Clover Corp, and Dan Cullen, the company’s Technical Manager, discuss plans for the new spray drying facility.*

## More than 3500 hits for Nu-Mega Ingredients™ review paper on high DHA fish oil

In 2018, a critical review *How does high DHA fish oil affect health? A systematic review of evidence* was steered by Nu-Mega™ Ingredients' research and development team and published in the globally prestigious *Critical Reviews in Food Science and Nutrition* journal.

The review, which focused on 113 studies into the effects of high DHA published since 2000, has been viewed at <https://www.tandfonline.com/doi/full/10.1080/10408398.2018.1425978> more than 3500 times in less than six months.

Dr Samaneh Ghasemi Fard, Nu-Mega™ Ingredients R&D Technologist and Research Liaison Officer and a lead author of the review, said it was the first major review of DHA research studies in nearly 20 years [since Health benefits of docosahexaenoic acid (DHA), Horrocks and Yeo 1999].

"The level of views shows a remarkable global interest in the impact of high DHA on the health of infants, adults and the elderly," Dr Ghasemi Fard says.

"The studies present the important physiological functions of DHA, which differ to those of EPA, in the heart and cardiovascular system, the brain and visual function, inflammation and immune function and growth/body mass index."

Of the 113 studies reviewed, 46% reported statistically significant positive results following the use of high DHA fish oils (65% in the heart, 32% in the brain and 44% in other medical aspects).

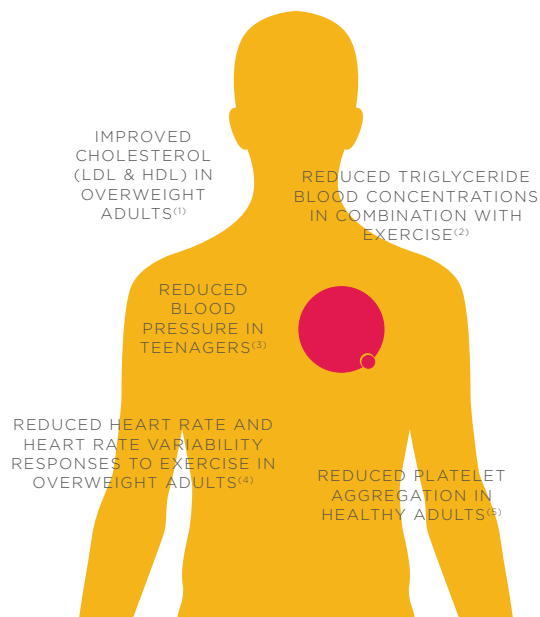
Differences have been reported in the possible physiological responses relative to age, as vastly different roles and effects were noticed in infants, adults and elderly individuals.

The studies used fish oil from different suppliers all over the world. Nu-Mega™ Ingredients, which is internationally recognised for its collaboration with research institutions, was the largest supplier. Thirty-six per cent of trials utilised the organisation's fish oils, however Nu-Mega™ Ingredients had no influence on the design, outcome or publication of any studies.

A poster presentation of the critical review will be featured at the Nutrition Society of Australia conference from November 27-30 in Canberra. The review has also been submitted for consideration at another major Australian conference in 2019.

The critical review is also available at Clover website <http://www.clovercorp.com.au/en/explore-the-latest/new-science/>

65% of recent studies showed that high DHA had positive effects on the heart and reduced the risk of sudden cardiac death. High DHA studies were associated with:



Dr Samaneh Ghasemi Fard of Nu-Mega™ Ingredients (centre) with two co-authors of the critical review: (left) Professor Giovanni M. Turchini, School of Life and Environmental Sciences, Deakin University; (right) Professor Andrew J. Sinclair, Department of Nutrition, Dietetics and Food, Monash University.



## 1g/d high DHA fish oil sufficient to lower plasma triglycerides by 20%

The ability of high dose of fish oil to reduce plasma triglycerides (TAG), which is an independent risk factor for cardiovascular disease, is well established. There is a growing number of observational studies reporting that fish oils containing a greater amount of DHA relative to EPA, are more effective in reducing TAG levels than fish oils with a higher amount of EPA <sup>(6)</sup>, Dr Ghasemi Fard says.

A dose response trial with high DHA fish oil supplementation showed a 6%, 20% and 25% TAG level reduction following supplementation with approximately 0.7, 1.2 and 2g of high DHA fish oil per day, over a period of 6 weeks <sup>(2)</sup>.

The beneficial TAG-lowering effects of high DHA fish oil was supported by a new study published in October 2018. Nu-Mega™ Ingredients supplied HiDHA® tuna oil and placebo oil for this study with no influence on its design, outcome or publication.

The study showed a 20% TAG level reduction following supplementation with a dose of just 1g of high DHA fish oil per day over an 8-week period in 53 healthy pre-menopausal women <sup>(7)</sup>.

“This is very promising as high dose prescriptions of omega-3 are commercially available for treatment of hypertriglyceridemia <sup>(8)</sup>,” Dr Ghasemi Fard says.

## Synergic effects of DHA + vitamin D3 on Multiple sclerosis

Multiple sclerosis (MS) is one of the most common causes of chronic neurological disability in adults and affects approximately one million people worldwide. The disease usually starts in early adult life (20–45 years) and is more common in women than men (ratio of 2:1).

The effect of HiDHA® tuna oil plus vitamin D3 on MS symptoms was studied by Kouchaki et al <sup>(9)</sup>. Findings of this study suggested that combined DHA and vitamin D3 supplementation improve MS-related symptoms and Expanded Disability Status Scale compared with the placebo group.

Authors also reported that serum high-sensitivity C-reactive protein and plasma total antioxidant capacity were significantly improved in the supplemented group.



## DHA can modify air pollution effects on allergic disease

Allergic diseases are among the fastest growing chronic conditions in Australia, and recent research suggests that susceptibility to allergies can be reduced simply by changes in diet.

Specifically, eating DHA-rich fish oil may mitigate excess risk of allergic sensitisation associated with higher exposure to traffic related air pollution (TRAP) in NSW children who were expected to be at higher genetic likelihood of allergies because of a family history of asthma <sup>(10)</sup>.

This is a secondary analysis of the Childhood Asthma Prevention Study birth cohort, where children were randomised to HiDHA™ tuna oil capsules or placebo from early life to 5 years.

Authors reported statistically significant interactions between high DHA fish oil supplementation and TRAP for house dust mite, inhalant and all-allergen skin prick tests at age 5.

“Not only can asthma and allergy be affected by the consumption of omega-3 fatty acids by patients themselves, but consumption by patients’ mothers may also have an influence. The few studies conducted last decade showed that if pregnant women took supplements of omega-3, their children were less likely to develop asthma,” Dr Ghasemi Fard says.

The benefits imparted by DHA omega-3 fatty acids may occur through the minimisation of inflammation. Other mechanisms by which fish oils may modify effects of TRAP include indirect influence on immune responses, via potential to influence the composition of the microbiome.

1. Combining fish-oil supplements with regular aerobic exercise improves body composition and cardiovascular disease risk factors. Hill AM, et al. *The American journal of clinical nutrition*. 2007.
2. Dose-dependent effects of docosahexaenoic acid-rich fish oil on erythrocyte docosahexaenoic acid and blood lipid levels. Milte CM, et al. *Br J Nutr*. 2008.
3. Effects of fish oil supplementation on markers of the metabolic syndrome. Pedersen MH, et al. *The Journal of pediatrics*. 2010.
4. Docosahexaenoic acid-rich fish oil improves heart rate variability and heart rate responses to exercise in overweight adults. Ninio DM, et al. *Br J Nutr*. 2008.
5. Effects of omega-3 polyunsaturated fatty acids on platelet function in healthy subjects and subjects with cardiovascular disease. McEwen BJ, et al. *Semin Thromb Hemost*; 2013.
6. How does high DHA fish oil affect health? A systematic review of evidence. Ghasemi Fard S, et al. *Crit Rev Food Sci Nutr*. 2018.
7. Effect of Low Dose Docosahexaenoic Acid-Rich Fish Oil on Plasma Lipids and Lipoproteins in Pre-Menopausal Women: A Dose(-) Response Randomized Placebo-Controlled Trial. Sparkes C, et al. *Nutrients*. 2018.
8. Prescription omega-3 fatty acids and their lipid effects: physiologic mechanisms of action and clinical implications. *Expert Rev Cardiovasc Ther*. Bays HE, et al. 2008.
9. High-dose omega-3 Fatty Acid Plus Vitamin D3 Supplementation Affects Clinical Symptoms and Metabolic Status of Patients with Multiple Sclerosis: A Randomized Controlled Clinical Trial. Kouchaki E, et al. *J Nutr*. 2018.
10. Trafficrelated air pollution and development of allergic sensitization in children during the first 8 years of life. Gruzieva O, et al. *J Allergy Clin Immunol*. 2012.



## Vitafoods Europe 2018 exhibition boosts Nu-Mega™ Ingredients' profile and sales

International trade shows have become a critical marketing tool for obtaining market insights, developing new products and promoting brand awareness, according to Bassam Hallak, Nu-Mega™ Ingredients' Global Business Manager.

"Three years ago the brand was known by a relatively small circle of clients. Since then we have exhibited in Europe and the USA, including at Vitafoods Europe in Geneva in 2017 and 2018, and we will exhibit there again in 2019. We will also co-exhibit again at Supply Side West in the USA in November this year.

"Our European client base has diversified, and the number of clients - including those coming on stream in the next 12 months - has increased in the past three years," Mr Hallak says.

"We gather a lot of insights from trade shows, and that's what has driven Nu-Mega™ Ingredients in developing new products to meet market needs. Our product range has more than tripled in the last two years and will increase further."

While the infant formula market is still a key segment for Nu-Mega™ Ingredients, the business is expanding into the general food markets. Three products were launched into the European market at Vitafoods:

Driphorm 360® is an ultra-high DHA powder developed to meet the needs of food and beverage manufacturers who want to increase the amount of DHA to an extremely high level without compromising on sensory aspects such as taste and smell.

Low protein DHA and ARA products and a vegan DHA powder were also launched.

"Within the infant formula market, two segments are growing," Mr Hallak says.

"Hypoallergenic infant formulas are increasingly important for children who display allergies from birth. As our normal DHA products have milk protein, we have developed these low protein products which contain no bovine protein.

"The vegan market is also growing very quickly, and we have launched a vegan DHA powder to serve this market."

Various finished products fortified with high levels of DHA were available for sampling on the Nu-Mega™ Ingredients' stand, including high DHA gummies, sports bars and beverages.

Nu-Mega™ Ingredients' presence at Vitafoods 2018 was a significant success, based on feedback from potential new customers which far exceeded expectations.



From left to right, Grace Shao, Nu-Mega™ Ingredients Business Development Asia; Peter Davey, Clover Corp CEO and Managing Director; Conor Buckley, Vice President of Socius Ingredients, distributor partner in the USA; Glenn Elliot, Nu-Mega™ Ingredients Quality and Regulatory Affairs Manager; Bassam Hallak, Nu-Mega™ Ingredients' Global Business Manager.

## Nu-Mega™ Ingredients opens new sales offices in Europe and New Zealand

Growth in the New Zealand and European markets for Nu-Mega™ Ingredients has resulted in the company opening its first sales offices in New Zealand and Amsterdam.

"We're experiencing solid growth in these markets, and expect sales to increase from current and new clients," says Bassam Hallak, Nu-Mega™ Ingredients' Global Business Manager.

The New Zealand sales office, led by Tania Williams, is based in the Waikato innovation park where Nu-Mega™ Ingredients has spray drying facilities for production of its microencapsulated powdered DHA and ARA products. The Amsterdam office and a warehouse to service the European market is headed up by Lukas Hohnke, Business Development Manager Europe. Product is being supplied from Australia and New Zealand.

"We chose Amsterdam because it provides Nu-Mega™ with the best distribution network throughout Europe and improves our customer engagement experience," Mr Hallak says. "Nu-Mega™ Ingredients closed its London office some time ago, and this is the first time the company has operated an office in Europe."

### 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 pharmaceuticals.

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 pharmaceutical 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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