

# The Good Oil

MARCH 2017

## Organic input certification from NASAA for Nu-Mega's DHA and ARA products



In a major breakthrough, Nu-Mega Ingredients have achieved organic input certification for omega-3 DHA and omega-6 ARA products, which can now be used in the rapidly growing organic infant formula market.

"We are strongly focused on market-driven innovations, and the global growth in the organic infant formula market has resulted in customers from Europe, Australasia and Asia Pacific asking about organic DHA and ARA," says Bassam Hallak, Nu-Mega's Global Business Manager.

"It has taken about a year, but we have now achieved certification from the Australian organic certifying body NASAA for all ingredients."

### The three stage process involved:

- An initial desktop check of all ingredient listings and formulations which confirmed certification was possible.
- A detailed review of all ingredients including those of suppliers to Nu-Mega.
- Factory audits to ensure our manufacturing facilities and practices are suitable for producing organic input products.

Late last year Nu-Mega received NASAA approval for all products, including omega-3 DHA (both tuna and algal) and omega-6 ARA powders and refined tuna DHA oil, as organic-input certified for organic foods.



"This is a major breakthrough for us in a number of markets," says Peter Davey, Managing Director/CEO of Nu-Mega Ingredients who has twice travelled to China this year with Mr Hallak and Grace Shao, International Business Development Manager – Sales.

"We held discussions with a number of potential clients in China who are seeking licences for infant formula under the new regime in that country (see story this issue), and have established that there are a lot of companies which are very keen to introduce an organic formulation.

"The big benefit for our clients is that there is no change to our formulations. They can continue using their chosen ingredients, but now have the advantage of using them in organic certified products.

"The organic segment is still relatively small, but it's the fastest growing segment within the infant formula market. We think we can attract a significant portion of that market because clients internationally are seeking to add organic infant formulas to their brands," Mr Davey says.

Europe is a particularly large organic market, and Nu-Mega already has an established client base there. Australasia and Asia Pacific also present major opportunities.

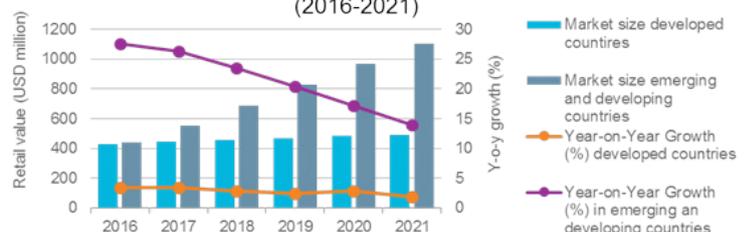
"The USA is somewhat more complicated because it has its own licensing authorities," Mr Davey says. "We have now started the process of becoming organic input certified in the US." ■

## Organic infant formula composition

To gain organic certification, 95% of the ingredients in an infant formula must be organic. The remaining 5% may include ingredients which cannot be delivered in organic format.

Nu-Mega's omega-3 DHA and omega-6 ARA supplements strengthen a manufacturer's organic claim, as they become an organic input certified ingredient in the remaining 5% of ingredients.

Organic Milk Formula Performance, Developed versus Emerging and Developing Countries (2016-2021)



Source: Euromonitor 2016

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## Nu-Mega launches new Hypoallergenic Omega-3 DHA encapsulated powder

Commercial sales are expected by mid-year of Nu-Mega's new Driphorm® HA HiDHA® 30, a hypoallergenic DHA powder which can be used as an omega-3 DHA supplement in goat and sheep milk-based infant formulas for babies and toddlers who cannot tolerate cow's milk.

The new product uses Nu-Mega's patented encapsulation technology and contains no bovine protein. It will also have far wider applications in global marketplaces, from non-protein beverages such as shakes and juices to the medical food market where metabolic disorders mean some patients cannot consume certain amino acids.

Driphorm® HA HiDHA® 30 is one of the first new products to be developed by Nu-Mega in New Zealand, where the company last year invested \$1 million in a new spray dryer. This spray dryer provides greater flexibility for small batch sizes and experimental products, which in turn allows Nu-Mega to more easily commercialise products.

Commercial trials of Driphorm® HA HiDHA® 30 were recently completed in New Zealand, and two major manufacturing clients are now evaluating goat milk infant formulas incorporating the product.

In 2014, the top three global goat infant formula manufacturers alone had a combined revenue of AU\$235 million. This is estimated to reach AU\$507 million by 2017, more than doubling over four years.



"Goat formula sales are growing rapidly worldwide, and we expect our first commercial sales mid-year," says Glenn Elliott, Nu-Mega Ingredients Research, Quality and Regulatory Manager.

"Supplementation with omega-3 DHA and omega-6 ARA fatty acids is desirable for all infant formula, whether it is based on cow, goat or sheep milk, so this market has very significant potential for us."

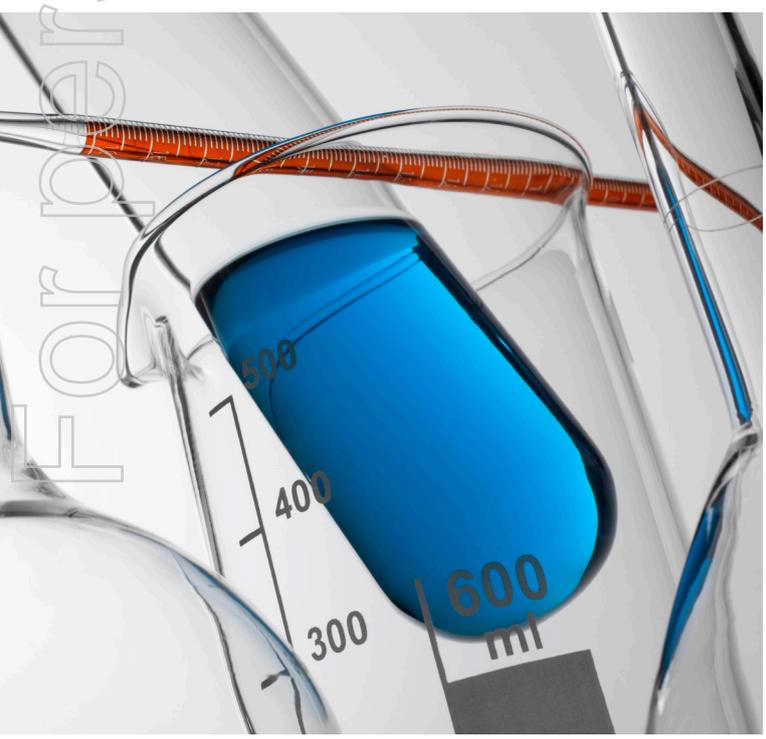
Goat milk and goat formula are easier to digest and, compared to cow's milk, are closer in their protein structure to human breast milk.

Driphorm® HA HiDHA® 30 contains highly refined tuna oil encapsulated in a protein-free microencapsulation matrix. Existing Nu-Mega microencapsulated products contain bovine milk protein whereas the new Driphorm® HA HiDHA® 30 has this protein replaced with a modified starch.

"Our tailored product formulation should also enable us to make strong inroads to the global market for protein-free DHA microencapsulated powders," Mr Elliott says. "One of the important regulatory aspects relates to the percentage of modified starch within the formulation for infant and toddler formula.

"Driphorm® HA HiDHA® 30 is fully compliant with the Codex Alimentarius (the internationally recognised standards, codes of practice and guidelines relating to food production and food safety) recommendations for the maximum permitted carry-over of modified starch into infant formula products.

"There are also continuing international concerns over food allergens generally, so this new product enables fortification of food and beverage products without creating dietary issues for children and adults with milk allergies." ■



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## Nu-Mega's ARA and DHA range assists China infant formula manufacturers in product differentiation

Impending new regulations covering infant formula in China have resulted in Nu-Mega working closely with a number of manufacturers, providing detailed information on the company's DHA and ARA ingredients to assist with the registration of different product formulations.

In June 2016, the China Food and Drug Administration (CFDA) announced the new regulations aimed at reducing the number of infant formula brands on the Chinese market. From January 1 2018, a manufacturer can register a maximum of three brands and nine product recipes with the CFDA.

Recipes for the same product type require significant differentiation in formulations based on scientific research.

Peter Davey, Managing Director/CEO of Nu-Mega Ingredients travelled to China in February and March with Bassam Hallak, Global Business Manager, and Grace Shao, International Business Development Manager – Sales.

"The recipe registration requires a vast amount of product information to be submitted by the manufacturer within their product dossier," Mr Davey says.

"This includes an R&D report of the product recipe, and material that supports the R&D, production and testing capabilities. All are to be submitted and approved before January 1 2018, otherwise the brands cannot be imported into China."

Overseas companies must manufacture their infant formula in a CNCA (Certification and Accreditation Administration of the People's Republic of China) approved plant before it can be sold in China.

The registration allows each manufacturing site to licence only three brands, each of which must be clearly distinguished by particular ingredients or formulations. Three different product types may be licensed under each brand.

"Nu-Mega can also support manufacturers which need to clearly distinguish their formulations for two or three brands," Ms Shao says. "We offer different forms of DHA and ARA powders which can be used to differentiate formulations."

Over the past few years, China brand owners have been seeking established overseas manufacturers in Australia, New Zealand, Europe and Canada. Nu-Mega's existing status as an overseas supplier of very high quality ingredients adds further weight to the company's sales strategy for China. ■



## Early product development phase now more efficient with new Buchi benchtop spray dryer

New product formulations can be more quickly fine-tuned and products brought to market faster following the purchase of an \$80,000 Buchi Mini Spray Dryer B-290 for Nu-Mega's research and development centre in Brisbane.

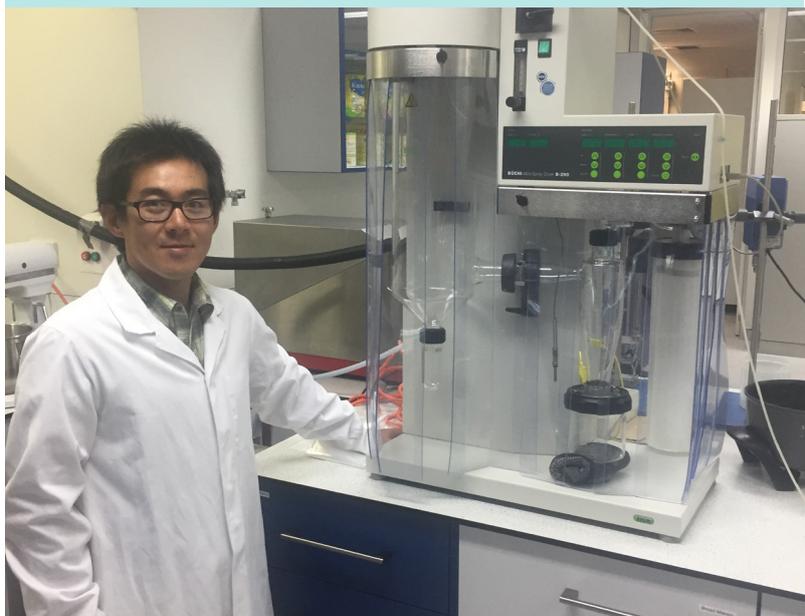
The European Buchi brand is recognised as an equipment leader internationally in the spray drying and microencapsulation fields.

"While we will still rely on external partners such as the CSIRO for larger pilot scale projects, the benchtop spray dryer will enable us to bring more preliminary innovation work inhouse," says Glenn Elliott, Nu-Mega Ingredients Research, Quality and Regulatory Manager.

"Where we are trialling different formulations, we can do that very efficiently instead of waiting for results from external partners. We can quickly fine-tune formulations before we go to the next R&D stage for a product, and can virtually lock in a formulation through the feedback we get from assessing the powder produced on the benchtop spray dryer.

"Moving quickly through that early development stage also enables us to get products to market a lot faster."

Current product testing on the new equipment includes high concentrate DHA oil powders. ■



Above: Bo Wang, Nu-Mega Ingredients' R&D Technologist, with the new Buchi benchtop spray dryer which is allowing the R&D team to bring more preliminary innovation work inhouse.

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## Nu-Mega achieves high concentration of omega-3 DHA supplementation for USA sports nutrition market

Nu-Mega Ingredients has increased its market development activities into the USA sports nutrition market, recently appointing a new USA distributor and co-exhibiting at the USA's largest food ingredients exhibition 'Supply Side West'.

During this exhibition Nu-Mega launched a new encapsulated DHA powder to meet demand from manufacturers wanting a very high concentration of omega-3 DHA in sports nutrition products.

"Through market insights we have identified a gap in the USA market for higher DHA fortification of sports nutrition, including beverages and protein bars, and in the general food markets," says Bassam Hallak, Nu-Mega's Global Business Manager.

"There was a clear demand for fortification of food products of greater than 250mg of DHA per serve whilst maintaining superior sensory attributes.

"Traditionally, the rate of fortification was about 50mg of DHA per serve, or less. Manufacturers are seeking a much higher rate of 250mg to 300mg of DHA per serve because of the benefits of increased DHA intake to athletes during training regimes."

Nu-Mega's research and development team has developed a microencapsulated powder product that delivers 35% DHA. A highly refined, concentrated DHA fish oil has been used, and there has been no negative impact on product stability or sensory aspects such as smell and taste.

Product trials using the highly concentrated DHA powder have already been conducted with manufacturers, including adding a high fortification rate of DHA into gummies, protein bars and sports powders.

"We've had one client fortify a sports powder with 500mg of DHA per serve with excellent sensory results, which has never been achieved before," Mr Hallak says.

More product trials will take place over the coming months. ■

### Omega-3 DHA and exercise

"A number of studies have showed the efficacy of omega-3 DHA supplementation on the physiological response to exercise," says Dr Samaneh Ghasemi Fard, Nu-Mega's R&D Technologist and Research Liaison Officer.

"Several animal and human studies have been conducted to assess the efficacy of Nu-Mega high DHA tuna fish oil on inflammation, speeding up exercise recovery, improving cognitive function, reducing heart rate and oxygen demand during exercise.

"As our Nu-Mega microencapsulated powders have a much higher level of DHA than competitor products, they are particularly well suited to this market. However no level of intake has yet been recommended for athletes."

Support	Comments
<b>Reduce delayed onset muscle soreness</b>	9 days DHA supplementation (3 g per day) reduced exercise-induced muscle soreness and stiffness in 27 healthy women after eccentric strength exercise (Corder et al., 2016)
<b>Speed up exercise</b>	21 days of DHA-rich fish oil supplementation (0.37g EPA + 0.23g DPA + 0.51g DHA) improved aspects of neuromuscular function and performance in male athletes compared to olive oil placebo (Lewis et al., 2015).
<b>Improve cognitive function</b>	An increase in the erythrocyte membrane DHA composition is positively correlated with dorsolateral prefrontal cortex activation and inversely correlated with reaction time (McNamara et al., 2010). 4 weeks of DHA-rich fish oil supplementation produced perceptual motor benefits (improvements in complex reaction time and efficiency which are keys to success) in 24 female elite soccer players (Guzmán et al., 2011).
<b>Burn fat and slow muscle loss</b>	Incorporation of DHA into skeletal muscle membranes increases the efficiency of oxygen use over a range of contractile force in rats and this is expressed as a higher sustained force and prolonged time to fatigue possibly by facilitating fat oxidation (Peoples and McLennan, 2014).
<b>Reduce heart rate and O<sub>2</sub> demand during exercise</b>	The fish oil supplementation lowered heart rate during incremental workloads to exhaustion. In addition, the fish oil supplementation lowered steady state submaximal exercise heart rate, whole body O <sub>2</sub> consumption and rate pressure product (Peoples et al., 2008). 6 g per day of DHA-rich fish oil supplementation (DHA: EPA: 4.3: 1) for 12 weeks improved heart rate variability by increasing high-frequency power in 65 overweight men and women. It also reduced heart rate at rest and during submaximal exercise (Ninio et al., 2008). 6 g of DHA-rich fish oil lowers heart rate during submaximal exercise in elite Australian Rules footballers (Buckley et al., 2009). Mediterranean diet or a high-protein diet with a 3g per day DHA-rich fish-oil (DHA: EPA ratio 1.5: 0.9) increased the omega-3 index and reduced the mean exercise heart rate and improved heart rate recovery (Macartney et al., 2014).
<b>Antioxidant Defence</b>	8 weeks of almond-based beverage enriched with DHA (160mg/100 ml) in 9 male professional athletes provided antioxidant defence and reduced protein peroxidative damage in the red blood cells (Martorell et al., 2015)

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