Giving baby the best start with vegetarian nutritional lipids

Sustainably sourced solutions to support optimal growth and development.

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Nutritional lipids for healthy infant development

The first 1,000 days of a baby's life – between the onset of a woman's pregnancy and the child's second birthday – are well-recognized to be an important time in an infant's growth and development. Good nutrition during this stage of life for both mother and baby is therefore crucial to ensuring the best start and a happy, healthy future.

Breastmilk is the gold standard for infant nutrition. It contains both omega-3 docosahexaenoic acid (DHA) and omega-6 arachidonic acid (ARA), which are long chain polyunsaturated fatty acids (LCPUFAs) that play a central role in brain development.[1,2] While a range of nutrients have a role to play in making breastmilk ideal for infant nutrition, scientific evidence continues to demonstrate the critical impact of DHA and ARA on early life and beyond. But for mothers who cannot or choose not to breastfeed, it is essential that infants receive these all-important LCPUFAs from other reliable sources.

For brands and supplement producers, a growing body of evidence supports the importance of developing infant nutrition solutions featuring an optimal composition of high-quality and efficacious omega-3 and omega-6 ingredients that reflect the profile of breastmilk to help babies and infants get the vital nutrition they need.

At the same time, parents – like many consumers across the world – are increasingly on the lookout for more sustainable infant formula and dietary supplement products. Advances in ingredient technologies are creating opportunities to explore more sustainable sources of nutritional lipids, which can help safeguard delicate marine ecosystems and protect the health of the planet.

Why should infant nutrition solutions contain a combination of DHA and ARA?

DHA and ARA and are important dietary fatty acids that offer multiple health benefits throughout the life cycle. Both nutrients accumulate in the brain and are key components of cell membrane phospholipids that play a critical role in cell division, differentiation and signaling.[3,4,5,6,7] For babies and infants, their impact is particularly prominent, and a growing body of research shows the unique benefits DHA and ARA offer when used together in infant nutrition.

Cognitive development

DHA is the main omega-3 fatty acid in the brain, representing 97% of total omega-3 fats present.8 Studies suggest that DHA has a positive impact on a child's brain development, including mental adaptability and problem solving, as well as attention and information processing.[9,10,11,12] ARA, on the other hand, constitutes around 48% of the omega-6 fatty acids in the brain.[13] DHA and ARA are both critical to overall brain health throughout life, supporting almost every area of brain function as a child grows.

Visual development

DHA is the most abundant omega-3 fatty acid in the retina of the eye, representing about 93% of its omega-3 content. Together, DHA and ARA have been shown to have positive effects on visual development when provided in efficacious levels during pregnancy and throughout infancy.[14] But for babies born prematurely, it isn't always possible to obtain the required intake of these nutrients before birth. In fact, research shows that pre-term babies have lower levels of DHA and ARA, which increases the risk of developing retinopathy of prematurity (ROP) – an eye disease caused by abnormal development of the blood vessels in the retina.[15] While rare, severe ROP can have life-long effects for infants who develop the condition. However, studies show that supplementation with both DHA and ARA can effectively reduce the risk of severe ROP by 50%, demonstrating the incredible potential of these nutrients for ensuring the best start in life.[16]

Striking the right balance between DHA and ARA requirements

While their impact in cognitive and visual development is particularly well-recognized, DHA and ARA are also vital for immune system development and function during infancy, and ARA promotes healthy bone formation, blood flow and blood vessel function.[17,18,19] Because these myriad benefits are derived from a combination of DHA and ARA, infant nutrition experts recommend using both nutritional lipids to support proper growth during this critical window of development.[20,21,22,23,24]

Approximately 25-50% of people in Europe, Asia and Oceania and up to 97% of the Latin American population carry a variation in the fatty acid desaturase (FADS) gene that limits their ability to synthesize DHA and ARA.[25] ARA synthesis is disproportionately affected with up to 28% of the variation in ARA blood levels attributed to FADS polymorphisms.[26] Due to low enzymatic activity levels in the first months of life, infants – especially those carrying variations of the FADS genes – are unable to supply their own DHA and ARA needs from precursors linoleic acid (LA) and α-linoleic acid (ALA).[30] To meet their nutritional requirements for optimal growth and development, it is vital that infants receive enough DHA and ARA, alongside the LCPUFA precursors LA and ALA.

Infant and follow-on formula currently marketed in many parts of the world are sometimes supplemented with higher levels of DHA than are typically found in breastmilk, while ARA is completely omitted. Although many studies have evaluated clinical outcomes associated with DHA and ARA supplemented infant formula, there is a lack of clinical research regarding the safety and suitability of infant and follow-on formula with DHA but not ARA.[27,28,29,30]

To ensure that infant nutrition products are safe and effective, internationally recognized pediatric and nutrition specialists have therefore called for the inclusion of both DHA and ARA in infant and follow-on formula in a ratio of 1:1 to 1:2 to mirror the composition of these components in breastmilk.

Meeting infant nutrition needs, sustainably

Omega-3s and omega-6s are clearly crucial for healthy infant development. At the same time, however, today's eco-conscious consumers want options that are good for their health and good for the planet. But not all solutions can deliver on both fronts.

Dive into sustainable lipid innovation

Traditionally, omega-3s like DHA have been derived from fish oil, which has contributed to major overfishing challenges and a decline in entire ocean ecosystems. This, combined with a rapidly growing global population, climate change and environmental shifts, is putting immense strain on the world's finite resources – driving the need for omega-3s derived from more planet-friendly sources. And consumers are proactively seeking vegetarian sources of omega-6s too.

This growing demand is creating an urgent need for more sustainable omega-3 and omega-6 sources. Alternative vegetarian sources have become a top priority for brands looking to innovate sustainably. dsm-firmenich's enhanced *life's*® portfolio, including *life'sDHA*® and *life's*®*ARA*, is sourced with sustainability in mind – offering potent solutions that also support the health of the planet.

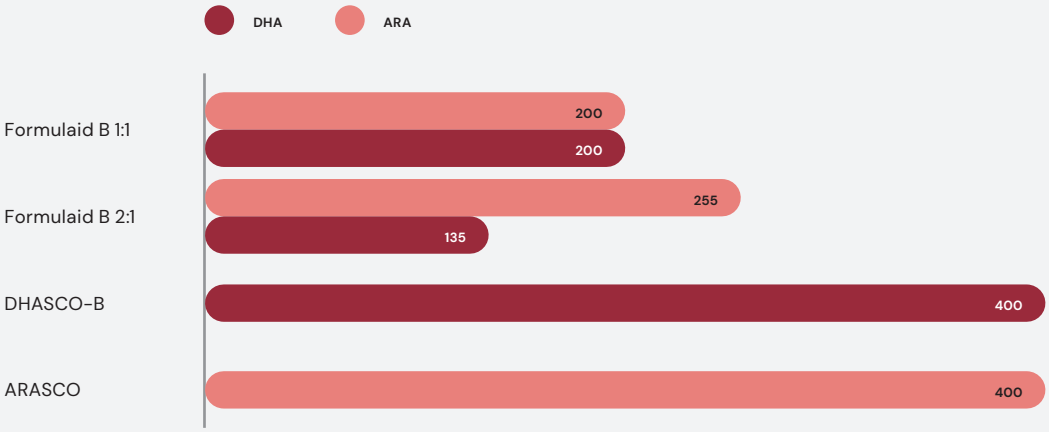
Grow your sales with purpose-led products

dsm-firmenich's enhanced *life's*® portfolio offers vegetarian, fermented ingredients that deliver the health benefits of both DHA and ARA – offering the essential building blocks needed to create a healthy future for infants. These clinically studied nutritional lipids are sustainably sourced and come in non-GMO, solvent-free and natural triglyceride oil and powder forms that are free from environmental and marine contaminants.

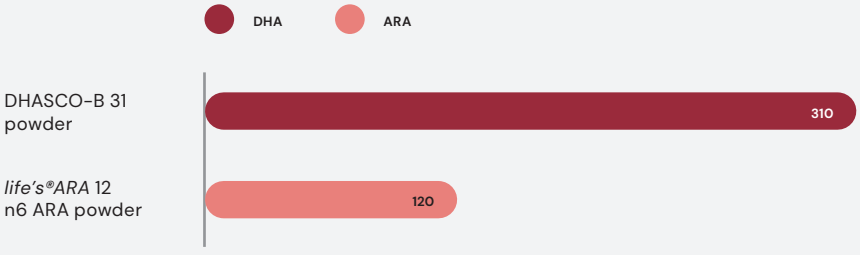
life's® portfolio for infant nutrition

DHA or ARA content (expressed as mg of fatty acid/gram)

Oils



Powders



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