Nutritional Products from Space Research

An algae-based oil, a key ingredient of infant formulas, heads a selection of spinoffs for consumer, home and recreational use.

It is difficult to imagine a connection between planetary space flight and baby food, but the connection does in fact exist. Commercially available infant formulas now contain a nutritional enrichment ingredient that traces its existence to NASA-sponsored research that explored the potential of algae as a recycling agent for long duration space travel.

The ingredient is an algae-based, vegetable-like oil known as Formulaid®. It was developed and is manufactured by Martek Biosciences Corporation, Columbia, Maryland, which has pioneered the commercial development of products based on microalgae; the company’s founders and principal scientists acquired their expertise in this area while working on the NASA program.

Formulaid is Martek’s leading product. Its value as a dietary supplement lies in the fact that it contains two essential polyunsaturated fatty acids known as DHA (docosahexaenoic acid) and ARA (arachidonic acid). DHA and ARA, found in human milk but not in most infant formulas, are believed by many researchers to be associated with mental and visual development.

Martek literature amplifies that statement: “DHA and ARA are the predominant fatty acids in the grey matter of the brain and DHA is particularly enriched in the retina. Children and adults obtain DHA primarily from their diets, since humans synthesize only small amounts of DHA. Infants acquire DHA and ARA initially in utero during pregnancy, and then from their diets via their mothers’ milk. DHA and ARA dietary supplementation may be particularly important for premature and low birth weight infants, who may not get their full allotment in utero.”

Left: The formula being fed to the baby contains an algae-based additive highly enriched in nutrients believed to be beneficial to infant mental and visual development; called Formulaid, the additive is an offshoot of space research. The additive has been introduced in Europe in the formula Neunatal (right) produced by Nutricia of The Netherlands.
There are also reasons to believe, Martek says, that DHA-supplemented formula can be beneficial to full-term infants as well as pre-
terms. Two major nutritional authorities—the British Nutrition Foundation and the United Nations Food and Agriculture Organization/World Health Organization—support that belief. Both have endorsed use of DHA and ARA as additives in both preterm and full-term infant formulas and as nutrients for women during pregnancy and lactation.

In 1985, Martin Marietta dropped out of the CELSS program when the company decided to discontinue support for bioscience research. Several of the Laboratories' scientists saw an opportunity to start a company and seek to commercialize their expertise in deriving compounds from algae and plants. In May 1985 they left Martin Marietta to form Algatex, Inc., which became Martek Biosciences Corporation in September of that year. Three of the group are still with the company: Dr. Richard J. Radmer, president and chief scientific officer; Dr. David J. Kyle, vice president, head of research and development; and Dr. Paul W. Behrens, director of physiology. Henry Linsert, Jr., is chairman and chief executive officer of Martek.

Martek has devoted more than a decade to research on microalgae, which the company calls "biochemically rich and diverse kingdom of organisms that have been overlooked by science and commercial interest because of culturing difficulties." Now, staffed by some 60 scientists representing all of the life sciences, Martek has solved many of the culturing problems and developed a number of patented products and processes, of which Formulaid is the "flagship" product.

In 1994, Martek was granted a U.S. patent for Formulaid and, in the same year the company signed an agreement with Nutricia, a leading European nutritional product manufacturer. Formulaid was added to Nutricia's infant formula for sale in Europe. In 1995, Martek was awarded a U.S. license to add Formulaid to the line of infant formulas for sale in the United States, with Food and Drug Administration approval. U.S. licenses are pending for other markets around the world.

Martek has also concluded licensing agreements with the Swiss company Sandoz, the Israeli firm Malevot, and the American company Nestle, which will introduce Formulaid into their infant formula lines. The company is also in the process of expanding its use of Formulaid in other products, including food and beverage applications.

Formulaid is a registered trademark of Martek Biosciences Corporation.