Nutrition Industry Executive
THE BUSINESS MAGAZINE FOR DIETARY SUPPLEMENT AND NUTRACEUTICAL MANUFACTURERS

Pondering Cognitive Support

Posted on April 3, 2019 by Lisa Schofield in NIE 2019, NIE 2019 04, NIE Features, Nutrition Industry Executive

Young adults are having more "senior moments" than ever. Stress, constant mental and physical activity plus poor diet and sleep-deprived lifestyles necessitate a well-rounded brain-support supplement.

Think about it—who doesn't enjoy learning something new? There's a momentary flush of self-confidence when the "aha!" hits. It's a great feeling.

On the flip side, when we forget simple things, like where we placed our cellphones or keys, or the name of the artist that sang that song we loved in high school, or that word we know we know—the frustration level skyrockets. And of course, these moments do not signify that there's any brain disorder or disease, but that we can improve cognitive function and memory through lifestyle modifications—and dietary supplements.

Shoji Matsukawa, chemical engineer for the New York-based Mitsubishi Gas Chemical, USA explained the difference between cognition and memory: cognition is the mental action or process of acquiring knowledge and understanding through thought, experience and the senses. Memory is the way the mind stores and remembers information. There are four different types of memory: implicit, semantic, episodic and working. "Working memory is one's short-term memory, which includes the

ability to recall relevant information in the middle of an activity. This overlaps with cognition, the creation of knowledge and thought, as they occur simultaneously," he said. "As we age, mitochondrial efficiency decreases, communication between neurons diminishes, and parts of the brain shrink—as much as 25 percent by age 80," he added.

As more people become aware of potential for cognitive decline and memory malfunction, this category has blossomed.

Elyse Lovett, MS, MBA, senior marketing manager for Kyowa Hakko USA, New York, has noticed a shift in the cognitive support supplement market with a new demographic emerging over the past five years, gearing toward the Millennials and Generation X. This demographic is looking for benefits in focus, attention and concentration as there are increases in stress levels in this demographic.

The cognitive support supplement market has been growing steadily over the past decade due to the global aging of the population—more than 2.1 billion people worldwide will be over the age of 65 in 2050, pointed out Stephanie Pres-tesacque, category director, Consumer Health at Diana Food (New Jersey).

She added that in a recent study presented at SupplySide West by Natural Marketing Institute, analyst Steve French asserted that losing mental capacity is the top health concern across all age groups. Interestingly, over the past 10 years, cognition and brain health have emerged as the top health concerns for younger people. "As a result, the market of supplements has broadened the offer to include new products for mental focus, stress management and stamina," she commented.

Aging Baby Boomers are often targeted for cognitive products, but more and more Millennials are seeking effective products that support better focus and cognitive/mental energy without the jitters or crash associated with caffeine intake, observed Mallory Junggren, senior director of marketing, Nutrition 21, LLC of New York. "This uptick in interest in cognitive products by younger consumer demographics is part of an increasing focus on 'active' nutrition," she reported.

Andrew Wheeler, vice president of marketing, FutureCeuticals and Van Drunen Farms, Illinois, said he sees "everyone from Millennials and Generation Z-ers to seniors are seeking cognitive health support today. And athletes are also realizing that the performance 'wall' they hit has a cognitive component to it."

Despite that younger and middle-aged adults are seeking cognitive support for mental performance boosting, they are also mindful—and fearful of developing dementia type illnesses as they get older, pointed out Richard Kozlenko, DPM, MPH, PhD, scientific advisor for California-based GCI Nutrients. "One of the huge forces is the growing attention, fear and anxiety to the epidemic impact of Alzheimer's disease which is terrifying and financially devastating to families. The sense of vulnerability and importance of preserving and protecting our cognitive skills dipped deeper into younger populations."

Kim Colletti, MBA, global product manager-brain health, Kemin Foods agreed that there is growing interest among younger healthy adults in natural cognitive-function-enhancing ingredients that help improve focus, and also boosts physical performance. "Whether it's a young professional juggling work, home and the gym, a gamer wanting a competitive edge for virtual reality play, or an athlete focusing on achieving top mental and physical performance, consumers are looking for that extra edge, and supplementation can be a healthy option. Overall, consumers are interested in cognition with their No. 1 concern being staying mentally sharp."

She added that research suggests that peak performance in several domains of cognition typically occurs as early as one's 20s. Therefore, she emphasized, formulators may want to concentrate on offering a more natural and gradual approach rather than a quick fix.

In the sector, observed Prestesacque, while the field of memory improvement remains dominant, new products like nootropics with promises around mental focus, resistance to stress, creativity and motivation are becoming more sought after. Millennials, students, business executives and working mothers are interested in supplements and performance beverages/bars that will help them cope with busy and stressful lifestyles, within which is "an emerging trend in dietary supplements designed for e-gamers who are looking for concentration and mental stamina," she described.

In agreement is Inger Larsen, director of North America sales, Oxford, U.K.-based Sibelius Natural Products, who noted, "Young adults are more likely to need to multi-task and perform at a more constant level than previous generations. Performance enhancement for jobs and activities are a key area of interest for young adults. In addition, focus and attention have also been a key trend for sports nutrition and performance (all ages)."

More specifically, observed Kozlenko, the cognitive/brain health performance category is featuring products to help protect DNA, brain and neuron lipoprotein membrane fluidity, enhance mitochondrial function, improve micro vessel elasticity, reduce homocysteine levels, support brain chemical and neurohormones, improve synaptic functioning, support brain nutrition, optimize the relationship of microbiome and brain health, as well as support and replenish the endocannabinoid system (ECS).

According to Junggren, cognitive products on the market can largely be divided into either a stimulant or non-stimulant. The different aspects of cognitive functioning these products provide include increased energy levels, improved mental acuity and focus, and heightened executive functioning. "Many energy-stimulating ingredients such as caffeine, bitter orange and guarana have been shown to increase heart rate, blood pressure, insomnia, nervousness and restlessness," she commented. "As a result, many consumers are beginning to seek non-stimulant options that can "naturally" boost energy and focus for an extended period, without the caffeine, jitters or crash."

Ruminating Ingredients

When deciding to formulate new generation brain/cognitive support products, there are many safe and effective ingredients that are available.

Cerebelle from Diana Foods is a proprietary blend of extracts made from two potent, polyphenol-rich fruits, and according to Prestesacque, it has been clinically shown to prevent age-related cognitive decline in healthy older adults. The extracts of grape and wild blueberry have also been thoroughly studied to exert positive impact on cognition.

The double-blind, randomized, placebo-controlled study, recently published in the Journals of Gerontology by researchers from the Canada-based Institute of Nutrition and Functional Foods (INAF) and the University of Bordeaux, France, showed that Cerebelle improved the memory of healthy older adults, she reported. Specifically, in the study, 215 healthy older adults from 60 to 70 years of age received either a placebo or 600 mg of Cerebelle daily for 24 weeks. Individuals in both groups performed a series of cognitive tests, designed to assess visuospatial learning and episodic memory (Paired Associate Learning, PAL), verbal episodic and recognition memory (VRM) and working memory (SSP). Supplementation with Cerebelle, according to the researchers, improved VRM free recall across the whole cohort. It was further noted that, within a subgroup with mild

cognitive impairment at baseline, six-month supplementation with Cerebelle showed improvements in both PAL and VRM. “These results infer that Cerebelle improves verbal memory in healthy elderly people. The study also demonstrated that it improves visuospatial memory—or the ability to recall previous events, emotions and places—in healthy senior people with a lower level of memory performance at baseline,” summarized Prestesacque.

Sibelius:sage is a botanical supplement that, said Larsen, acts on multiple aspects of cognitive function, including specific aspects of memory, attention, anxiolytic and general aspects of inflammation and anti-oxidant. “While Salvia officinalis has been used for more than two millennia for general cognitive support, we have proven (biochemical, in vitro and in vivo, trials) that the phytochemical profile and activity of Sibelius:sage is unique when compared to other Salvia officinalis varietals,” she said.

Futureceuticals’ NeuroFactor, derived from the whole coffee fruit, “is clinically shown to significantly increase levels of a key neuroprotein (BDNF) vital to learning, memory, and higher thinking,” Wheeler described. NeuroFactor contains a unique profile of polyphenols that have been shown in clinical study to stimulate the production of BDNF (brain-derived neurotrophic factor), a key neuroprotein involved in overall brain health. BDNF has been widely reported to play a critical role in neuronal development, maintenance, repair and protection against neuro-degeneration.

“Futureceuticals will be coming out with some exciting functional news in this regard this year, that’s the gold standard, functional outcomes in human subjects,” he revealed. “This cognitive space has lacked that up until this point, so this is an exciting time for science geeks like us. It’s great to see the mouse complete a maze, but to document human cognitive improvement is where it’s really at,” he emphasized.

Kemin Foods’ Neumentix is a water-extracted, naturally-sourced nootropic that is derived from a patented line of spearmint bred for high polyphenols, specifically rosmarinic acid, which has demonstrated brain benefits, according to Colletti. “The nootropic benefits from a recent Neumentix clinical study were sustained over a long period of time—improved attention and reactive agility were observed at 30 days and were still present at 90 days,” she reported.

Neumentix has three intervention studies as well as preclinical, mechanism of action, safety and plant characterization studies supporting its positioning as a cognitive performance ingredient. Colletti noted that the research supports cognitive performance claims such as, improves working memory, improves short term memory, supports sustained attention and focus as well as supports physical agility and choice reaction performance with continued use when taken as recommended.

In a recent, randomized, placebo-controlled, double-blind study with 142 young healthy and active women and men, Colletti described, Neumentix supplementation was shown to improve sustained attention in young, healthy adults. These statistically significant effects compared to placebo were observed as early as 30 days following daily supplementation with 900 mg of Neumentix and these significant improvements were still present after 90 days of supplementation. “Therefore, Neumentix is great solution for consumers looking for an ingredient that works more naturally and over time to support working memory, sustained attention and focus, without disrupting sleep,” she commented.

Kemin Foods’ FloraGlo Lutein has been more widely known for its vision-support capabilities for the better part of two decades, but its cognitive support-promoting abilities has emerged, according to Ceci Snyder, MS, RD, global vision product manager. Specifically, she reported, FloraGLO Lutein now has four randomized, double-blind, placebo-controlled trials to support its use in brain supplements, with three new studies just in the last year. “For formulators looking for strong support of brain ingredients, the new studies show how FloraGLO Lutein and R,R’-zeaxanthin support blood

flow to specific brain regions, enhance neural activation, support complex attention and cognitive flexibility, improve visual memory and (with increased macular pigment optical density) reasoning ability," she described.

When looking at the observational data on lutein, she added, some of the more compelling new research reveals the relationship between macular pigment optical density (MPOD), which is a measure of lutein/zeaxanthin status in the eye, and outcomes in children. Associations have been seen between MPOD and cognitive performance, memory and academic achievement in children. In Hassevoort et al., children with higher MPOD made fewer errors while reconstructing previously studied spatial layouts, indicating that MPOD was related to greater relational memory performance.

PQQ (pyrroloquinoline quinone) is an ingredient gaining interest as a dietary supplement and nutra-food ingredient geared toward cognitive support. And, according to Kozlenko, while only discovered about 50 years ago, researchers have been exploring its benefits in brain health. "PQQ (and GCI Nutrients' PQQ-Sure) has recently been found to increase the formation of new nerve cells. In addition, researchers have found that PQQ can promote growth of new mitochondria! This is an important longevity strategy that can help prevent the diseases of aging."

During the life span, the brain suffers from multiple sources of damage, he explained. As these effects accumulate, the development of neurodegenerative disorders can result, as well as the risk of stroke from progressive injury to brain blood vessels. Brain trauma is yet another way that the delicate microstructure of brain cells is disrupted, leading to loss of cognition and function. "PQQ has been found to help guard the brain against these major insults," he said. "Researchers are uncovering how PQQ functions as a neuroprotective agent that can help protect memory and cognition."

Mitsubishi Gas Chemical's BioPQQ is a natural source of pyrroloquinoline quinone created using a patented fermentation process, according to Matsukawa, who explained that BioPQQ supports cognitive health by promoting nerve growth factor in the brain, as well as the creation of mitochondria, the energy furnace in cells. BioPQQ also has "robust" antioxidant effects that potentially protect neurons susceptible to lethal damage from oxidative stress.

Matsukawa described one human clinical study, which found that taking BioPQQ for eight weeks may reduce confusion, anxiety and depression and improve vigor. Other studies suggest that taking BioPQQ for 24 weeks may increase memory recall, reverse the decline in cognitive function and improve other higher brain functions like spatial awareness; it also has the potential to improve working memory—such as learning, reasoning and comprehension.

BioPQQ, he added, has been successfully filed as a new dietary ingredient (NDI) with the FDA (U.S. Food and Drug Adminsitration), is GRAS (generally recognized as safe) and has earned Informed-Choice and Informed-Sport certification. Additionally, it is newly listed on the European Union's list of Novel Food Ingredients and marketed under its European sister-brand name, MGCPQQ.

Nutrition 21, LLC's Nitrosigine complex bonds arginine and silicon and is stabilized by inositol, and has been shown in a study to significantly increase nitric oxide production over arginine AKG, agmatine sulfate, citrulline malate, L-arginine and citrulline, according to James Komorowski, chief science officer. High levels of nitric oxide lead to better blood flow, which accelerates transport of nutrients and glucose to the brain; "this increase in nitric oxide levels is the proposed mechanism of action for how Nitrosigine significantly boosts cognitive function," he asserted.

Recent clinical data on Nitrosigine has shown it can enhance mental flexibility, processing speed, executive functioning, mental focus and acuity—before and after workouts. Komorowski reported

that results from a randomized, double-blind, placebo-controlled, crossover clinical trial demonstrated that Nitrosigine “prevents the decline in cognitive function that can be seen following strenuous exercise. This clinical study utilized the Trail Making Test (TMT), which is a widely used instrument designed to assess cognitive processing speed and executive functioning.”

In the study, participants took either Nitrosigine or placebo, and the TMT was used to measure cognitive function prior to dosing and immediately after intense exercise at increasing workloads until exhaustion. According to Komorowski, results showed that Nitrosigine significantly improved cognitive function parameters of mental acuity, focus and processing speed after exercise when compared to placebo. “Specifically, results showed that Nitrosigine prevented the exercise-induced cognitive function decline of 51 percent seen in the placebo group. A post-hoc analysis of a separate clinical study, which also utilized a TMT, showed that after taking just a single dose of Nitrosigine, subjects demonstrated significantly improved cognitive flexibility measured by the TMT B-A score,” he elaborated.

Further, additional new clinical study results show that Nitrosigine inhibits the metabolic pathway that catabolizes arginine, thereby enhancing arginine bioavailability, Komorowski added. The study also shows that Nitrosigine decreases levels of arginase, an enzyme that impedes nitric oxide production by limiting arginine availability. “This is especially noteworthy because arginine as an ingredient itself, or when converted from citrulline, is highly susceptible to being broken down by arginase, while Nitrosigine is not,” he clarified.

Kyowa Hakko’s Cognizin Citicoline, Lovett described, “is a potent brain health nutrient found naturally in the body. Cognizin is made by a innovative fermentation process to yield high quality and purity and is backed by research studies to support focus, attention and mental energy. Cognizin is GRAS, non-GMO (genetically modified organism), stable and soluble so really great for any delivery form.”

Of course, there are other ingredients shown to be beneficial for cognitive support, such as vinpocetine and ginkgo. But the opportunities to be successful with brain-support products for younger adults continue to be vast. Life is busier than ever and the demands placed upon adults today require more cognitive acuity and output for a longer duration. NIE

For More Information:

Diana Food, www.diana-food.com/cerebelle
Futureceuticals, www.futureceuticals.com
GCI Nutrients, www.gcinutrients.com
Kemin Foods, www.kemin.com/health
Kyowa Hakko, www.kyowa-usa.com
Mitsubishi Gas Chemical USA, www.biopqq.com
Nutrition 21, www.nutrition21.com
Sibelius Natural Products, www.sibeliusnaturalproducts.com