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## L-ergothioneine poised for breakthrough in 2017, experts say

By Hank Schultz, 06-Jan-2017

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**The coming year could be a big one for l-ergothioneine, an ingredient for which the scientific backing has been slowly building. New regulatory approvals and new developments in the supply sphere all augur well for this powerful antioxidant.**

### Positive EFSA ruling

Late last year, the European Food Safety Authority (EFSA) released a positive ruling on a novel food submission from French firm Tetrahedron that l-ergothioneine is safe for use in food and supplements. This ruling allayed fears in some quarters that the ingredient might raise the risk of diabetes and some inflammatory conditions.

The ruling stated that human studies submitted suggest there are “no relationships” between taking l-ergothioneine supplements and fortified foods and the susceptibility to or development of diabetes mellitus, Crohn’s disease or rheumatoid arthritis.

EFSA’s Dietetic Products, Nutrition and Allergies (NDA) panel also said they had no concerns regarding genotoxicity at the proposed daily doses of 30 mg per day for adults and 20 mg per day for children in food supplements and foods like non-alcoholic drinks, cereal bars, milk, fresh dairy and chocolate.

L-ergothioneine was first isolated as a natural compound from rye ergot (*Claviceps purpurea*) in 1909. It is naturally present in small amounts in food sources like mushrooms, some varieties of black and red beans (*Phaseolus vulgaris*) and cereals.

### Characterization as a vitamin

Bruce Ames, PhD, of the Children’s Hospital of Oakland (CA) has done much work on the substance over his long career. The fact that the body has a dedicated transporter for the molecule was a clue that it performed a vital function.

*“It’s a very effective antioxidant. The body clearly wants it, and it doesn’t make it itself. I think it’s pretty clear that it is some kind of ‘vitamin’ that affects aging, and I use the term vitamin to mean anything that helps keep the body free of disease that the body is specifically pumping in,”* Ames told NutraIngredients-USA.

*“There are a whole series of specialized antioxidants that the body is taking in specifically and having enough of those helps extend the body’s healthy lifespan,”* he said.

Jan Trampota, CEO of L-ergothioneine (also referred to as EGT) supplier Mironova Labs concurred with Ames’ assessment.

*“It well established that EGT is a uniquely powerful and versatile antioxidant; the EGT-transporter is manifested in nearly every species on the planet, having been genetically conserved in biological kingdoms over millions of years of natural selection. In human, the EGT-transporter is expressed specifically in those key cells and tissues that are highly sensitive to forces of aging—principally inflammation and free radical damage—which indicates that EGT’s antioxidant protection in those cells is critically important to their survival,”* he said.

Benoit Turpin, spokesman for Tetrahedron, said the substance is known to accumulate selective to those tissues most subject to oxidative stress. As such, he said it can be thought of as a “physiological antioxidant.” He anticipates ever wider application for his company’s ingredient, branded as Ergoneine, for which the company has self-affirmed GRAS status.

*“We also know that, since specificity is key, the body utilizes an active transport mechanism in order to deliver L-ergothioneine specifically to the tissues and organs that need it the most. Since it cannot be synthesized by the body and needs to be consumed, we anticipate that, as formulators and end users become more knowledgeable about its physiological benefits, it will start getting used in body system specific formulations such cardiovascular, cognitive, sports, joints, anti-aging, eye health and skin health products,”* he said.

### Low public awareness, cost issues

Turpin said the public awareness of L-ergothioneine is currently low, which has stunted market growth. Ames’s characterization of the substance as a ‘vitamin’ notwithstanding, there is no known deficiency state for the substance in the body. And commercial-scale sources have been slow to develop. One advantage of Tetrahedron’s ingredient, Turpin said, is its long shelf life.

*“L-Ergothioneine is, for sure, not a household name. This being said, folks who are familiar with mushroom biochemistry and their beneficial physiological impact on various body systems will be more knowledgeable. Truth be told as well is that, since this wonderful ingredient has only recently been commercially available, we would not expect it to be on everyone’s lips,”* he said.

The cost of the ingredient has been another hurdle to more rapid growth. Like some other suppliers of synthesized ingredients, Turpin focuses on the high purity of the Tetrahedron ingredient, which he said could lead to a price competitive cost-in-use.

*“We are very confident that formulators can develop condition specific formulas using the 5 mg recommended daily dose of Ergoneine, along with other science based condition specific ingredients targeting specific body systems and offer a finished product with a cost of less than \$1/day to the end user,”* he said.

Trampota said Miranova has been focused on the cost issue and recently, after years of development, had a process breakthrough that made the cost question much more advantageous.

*“Historically high price and lack of commercial availability have prevented EGT from use in food and dietary supplements. Following nearly 10 years of development, Mironova Labs was granted a patent this past September for a process that delivers pure EGT at a commercially viable price. Over the past two years we have made significant investments in process validation and in the completion of GRAS self-affirmation, and we are now offering Mironova EGT+ for widespread use in nutritional health and cosmetic applications,”* he said.

Blue California launched a fermentation-based version of L-ergothioneine branded as ErgoActive in late 2015 that the company said also solves the cost issue.

*“I believe the high cost has been a major problem for product developers and marketers in the past. Fermentation allows us to produce this product at a significantly lower cost, high purity, and with guaranteed availability,”* said Cecilia McCollum, executive vice president of Blue California.

### Science piles up

The scientific backing for the ingredient has been accumulating over the past decade. A 2005 paper *Gründemann et al. published in PNAS (Vol. 102, pp. 5256-5261, doi: 10.1073/pnas.0408624102)* reported the existence of a specific transporter for l-ergothioneine, where cells accumulate the amino acid and *“avidly retain it”*. Gründemann went on in a 2012 review (*Preventive Medicine*, Vol 54, pp. S71-S74) that the existence of the transporter implied an important physiological benefit. And a paper published in 2010 by Solomon Snyder, MD, Professor of Neuroscience at Johns Hopkins University School of Medicine, describes the amino acid echoed Ames’s characterization of the substance as a possible vitamin. And more recently, an intriguing small scale study looking at the makeup of the medulla oblongata of infants that have died from Sudden Infant Death Syndrome and comparing that to age-matched controls found that [L-ergothioneine status is one of the biomarkers that might be predictive of infants who are at higher risk of SIDS](#).

### Anti aging target

The infant information notwithstanding, the science as it stands seems to best support an anti-aging positioning for the ingredient.

*“Over the last ten years, EGT research has been accelerating rapidly, and there is mounting evidence to support the theory that EGT it is part of your body’s response, part of its natural defense mechanism, and that the EGT-transporter functions to accumulate EGT for protection of those tissues most affected by inflammation and oxidative stress—primary factors of aging,”* Trampota said.

*“To this day, there has been numerous in vitro, in vivo and 3 human clinical studies, including [the latest using the Tetrahedron’s product](#) that clearly shows an excellent bioavailability and tolerance of Ergoneine by the body. This being said, additional clinical studies need to be undertaken,”* Turpin said.

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