

food&health

 **SaraPEPPTM Nu**

Be focused – stay smart



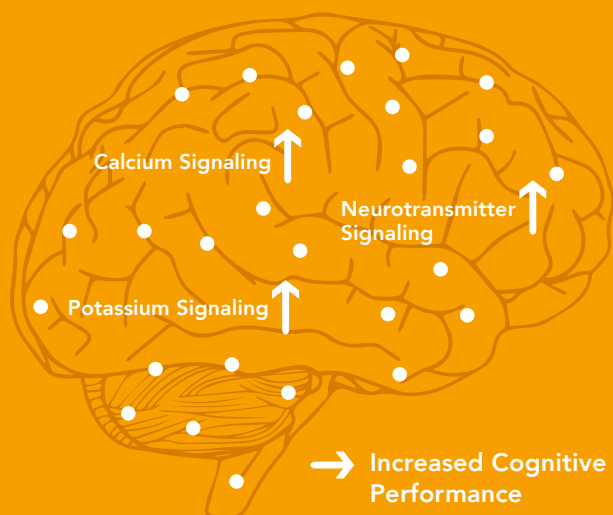
SaraPEPP™ Nu

Biological Source



SaraPEPP™ Nu is a unique, natural and high quality Timut pepper MCT oil extract. Timut pepper (*Zanthoxylum armatum*) is a member of the citrus family (Rutaceae) and is native to the southern parts of the Himalaya, especially Nepal. Also known as Nepalese pepper it has a characteristic grape-fruit-like taste and a tongue-tingling sensation similar to the closely related Sichuan pepper, but is not a pepper as conventionally known. Timut pepper is one of the most important spices in the Nepalese, Bhutanese and Tibetan cuisine, as only a few spices can be grown in the high altitudes of the Himalaya.

The dried fruits of Timut pepper are used to prepare SaraPEPP™ Nu by a gentle extraction process using MCT (Medium-chain triglycerides) oil as extraction solvent. This process ensures a high content of the main lead substance, the alkylamide 'hydroxy- α -sanshool'. MCT oil, also called the "Brain Octane" and well known for its superb bioavailability, is associated with several health benefits like improved cognitive and memory function, energy boost amongst others. The benefits of pure MCT oil are only mediated by a relatively high daily dosage of at least 20 grams.



● SaraPEPP™ Nu

Mode of Action



Extrinsic and intrinsic factors are generally causing brain aging which impacts overall cognitive performance, mood and finally quality of life. Usually starting from midlife, first signs of mild cognitive impairment could occur and mental performance is slowly decreased. Many factors are typically involved in brain aging like a reduced release of neurotransmitters, a decrease in receptor density and sensitivity combined with a reduced cardiovascular function in the brain.

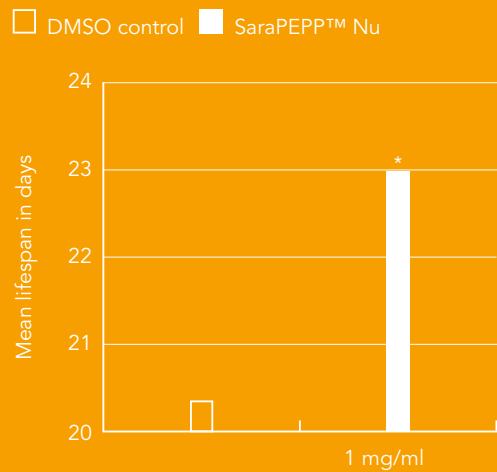
Hydroxy- α -sanshool and *Zanthoxylum*-extracts have been reported to exert many different potential mechanisms to improve brain activity like increased acetylcholine and gamma-aminobutyric acid (GABA) release, interactions with different receptors like the transient receptor potential (TRP) channel receptors and tandem pore domain potassium channels, e.g. KCNK3. Furthermore hydroxy- α -sanshool shows structural similarities to some of the native receptor ligands and to monoamine neurotransmitters like serotonin and dopamine. But most probably not only a single mechanism is involved in mediating the cognitive benefits of SaraPEPP™ Nu but a series of synergistic activation effects.

Bioassay Study Results



The nematode *Caenorhabditis elegans* (*C. elegans*) is frequently used as a model organism to investigate aging processes and the neuronal development of the nervous system, as the simple nematode has a relatively high similarity to humans on a genetic level. Several compounds known to be active on the human central nervous system are extending lifespan in *C. elegans*, mediated mainly by serotonin and dopamine pathways. In this study it could be demonstrated that SaraPEPP™ Nu is able to significantly extend the mean lifespan of *C. elegans*.

Longevity effects in nematode *C. elegans*



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Clinical Study Results



The acute and chronic effects of SaraPEPP™ Nu on cognitive performance and cerebral blood flow (CBF) were evaluated in a randomized, double blind, and placebo controlled study using the Computerized Mental Performance Assessment System (COMPASS) and quantitative Near Infrared Spectroscopy (qNIRS). COMPASS allows assessments across major cognitive abilities like attention, alertness, executive function and memory. The clinical trial was performed with 81 healthy humans (both genders) with an average age of 42.4 years. A total quantity of 2800 mg of SaraPEPP™ Nu was taken on a twice-daily basis over a period of 57 days. Cognitive performance was assessed post-dose on day 1 (acute effects) and day 57 (chronic effects). SaraPEPP™ Nu was well tolerated during the clinical study without any signs of potential side effects.

Acute effects

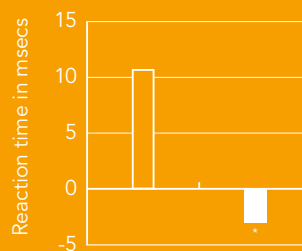
- Significantly faster performance on the reaction times of all attention tasks
- Improved accuracy of RVIP (Rapid Visual Information Processing) performance, a test to measure working memory and attention
- Improvement of neural efficacy demonstrated in the CBF study arm in response to task performance.

Chronic effects

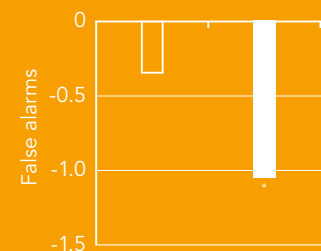
- Significantly faster performance across all cognition tasks
- Reduced ratings of mental fatigue
- Improvement of neural efficacy demonstrated in the CBF study arm in response to task performance, mostly pronounced during RVIP attention task

□ Placebo ■ SaraPEPP™ Nu

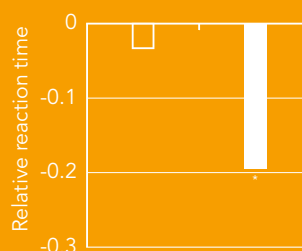
Acute cognitive effect Speed of Attention



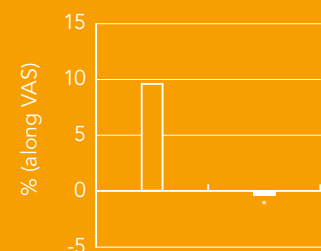
Acute cognitive effect RVIP performance



Chronic cognitive effect Speed of Performance



Chronic cognitive effect Mental Fatigue



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Suitable Product Applications

- Cognition enhancers
- Nootropics
- Brain energizers
- Mental performance enhancers
- Anti-aging products for the brain

Product Attributes

- Oil-soluble liquid that is suitable for dietary supplement applications, MCT-oil-based functional foods and food-grade emulsions
- Suitable to be blended with other lipid-soluble nutrients, e.g. Omegas, Vitamins A & E
- Grapefruit-like taste and odor
- None-pungent and no off-taste properties
- Suitable for students, working professionals and golden agers
- Recommended daily dosage of 1400 mg (chronic use) – 2800 mg (acute use)

Benefits

- SaraPEPP™ Nu is a natural and innovative ingredient that is prepared from dried Timut pepper and MCT oil
- SaraPEPP™ Nu extends life-span in nematodes, indicating an anti-ageing effect on the neuronal system
- Improvement of overall cognitive function, working memory and attention demonstrated by a randomized, double blind and placebo controlled clinical trial after acute and chronic administration
- Improvement of neural efficacy demonstrated in the cerebral blood flow study arm after acute and chronic administration



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