



eSports - The Gamer Opportunity! A natural nootropic ingredient connecting focus & reaction performance



**GET YOUR HEAD
IN THE GAME!**

Neumentix™ now also supports improved concentration and reaction performance, with continued use.



FOCUS AND REACTION PERFORMANCE REDEFINED – A QUICK FIX ISN'T ENOUGH ANYMORE

Key Takeaways:

- Neumentix™, a patented nootropic ingredient rich in polyphenols, is redefining focus by delivering lasting benefits
- Young, healthy, active men and women experienced an 11% improvement in focus in a 90-day clinical study
- Gamers are looking for a natural cognitive performance option that improves focus and reaction performance, like Neumentix™

THE GAMER OPPORTUNITY

For gamers who take supplements, 80% take them at least 5 days per week.¹ Gamers are part of an electronic sports industry, called eSports, where viewers watch gamers play in real time. In 2018 eSport worldwide game sales reached \$138 billion, up 13.3 percent from the prior year.² This represents a substantial supplement business opportunity in eSports. Whether gamers are competing in a professional event or playing for the love of the sport, they are looking for a competitive edge. Neumentix could be a secret weapon to blow away their competition!

GAMERS WANT REACTION PERFORMANCE

NEUMENTIX RESEARCH LINKS FOCUS TO PHYSICAL REACTION PERFORMANCE

There is immense and growing interest in ingredients with cognitive benefits that can enhance physical performance. However, most ingredients in the eSports nootropic market do not typically tout lasting benefits for both cognitive and physical performance.

Yet, more recently, new research with Neumentix Phenolic complex K110-42 (Neumentix) revealed exactly that improvements in cognitive and physical performance were achievable after 30 days of supplementation and sustainable through the length of the 90-day study.³

Also unique was the use of the Makoto Arena II⁴ (Fig 1), a novel physical assessment tool that links mental to physical performance. Participants taking Neumentix showed statistically significant improvements compared to placebo in various aspects of the Makoto Arena II including choice reaction performance, agility and cross-body movements. **These findings are directly indicative of the benefits of Neumentix for performance in gaming and athletic environments requiring focus, multitasking and agility.**

The novelty of the Makoto Arena II lies in its ability to bridge mental and physical performance in a multi-dimensional and dynamic manner. The device uses lights and tones coming from targets on three towers and three corresponding footplates. After the light turns on and the tone sounds, the participants react as quickly as possible to contact the correct target with their hands (towers) and feet (footplates). Makoto testing protocols include a one-tower stationary, two-tower lateral and a three-tower multi-directional protocol. For each test, the Makoto Arena II records choice reaction time, which is measured from stimulus to successful hit for the 30 second test. The total number of successful hits was also recorded for each test.

As such, the Makoto Arena II requires full body movements to measure choice reaction performance and agility.



FIGURE 1

Makoto Arena II, Makoto USA, Elk Grove Village, IL
<http://www.makoto-usa.com/>

The Makoto Arena II provides a novel means of assessing choice reaction performance related to physical movements on a millisecond scale and may translate better to real world applications.^{5,6,7}

Although some debate exists about the required physical activity in eSports performance, it is clear that movement and coordination are important for success^{8,9}. Like traditional sports, eSports require mental and physical training related to hand-eye coordination and complex game theory¹⁰. In fact, professional gamers can train up to 14 hours per day to maintain their elite status; which requires high levels of physical stamina and characteristics like fast reflexes, manual dexterity and excellent hand-eye coordination⁹. Improved reaction performance can contribute to success in this highly competitive field where rapid complex decisions and corresponding movement are essential.

For example, millisecond intervals of time can have significant impact on common athletic activities. A delay in reaction can result in missed shots in eSport games, missed shots on the tennis court, failed goal keeping attempts in a soccer game, or a failed effort at blocking a spike on the volleyball court.^{9,10,11,12}

NEUMENTIX AS A NATURAL NOOTROPIC FOR PERFORMANCE

The use of the Makoto Arena II, provided the opportunity to demonstrate the nootropic benefits of Neumentix using a novel device.¹⁵ However, this study clearly broadens the application of Neumentix allowing for the evolution of a cognitive ingredient into the eSports nootropic market. Both gamers and athletes searching for natural, safe and non-stimulant nootropic solutions that support both physical reaction performance and focus are likely to benefit from an ingredient like Neumentix.

GAMERS WANT FOCUS

NEW CLINICAL STUDY SHOWS CONTINUED USE OF NEUMENTIX™ SUPPORTS SUSTAINED ATTENTION.

Neumentix is a water-extracted natural dietary ingredient that is derived from spearmint and selectively bred to be high in polyphenols. Targeted to support cognitive performance, this distinct ingredient is redefining the approach to cognitive improvements, including domains such as focus and attention.

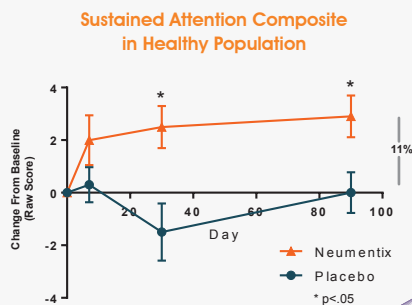
In today's fast-paced culture, adults of all ages require sustained attention and concentration for tasks related to work, family life, sports, e-sports, and daily activities such as reading and driving. **Sustained attention is the capacity to maintain focus on a specific item or task over an extended timeframe.** This ability is essential to daily life and is becoming more important for younger adults who may be juggling the demands of work and home life. **An ingredient like Neumentix offers a safe, natural and non-stimulant nootropic solution that supports the ability to focus.**

In a recent, randomized, placebo-controlled, double-blind study, Neumentix Phenolic Complex K110-42 (Neumentix™) supplementation was shown to improve sustained attention in a group of 142 young, healthy, active men and women with an average age of 27.¹⁶ Cognitive performance was measured using a computerized test battery for sustained attention on days 0, 7, 30 and 90. Those taking Neumentix achieved an 11% improvement in focus at day 90 over baseline levels, significantly higher than the adults taking a placebo.(Fig 2) Effects were observed as early as 30 days following daily supplementation with 900 mg of Neumentix and were maintained throughout the duration of the 90-day study.

These findings build on earlier work on older adults and further emphasize the uniqueness of this special ingredient. Unlike caffeine and most other cognitive ingredients on the market today that offer quick fixes and short-term benefits, Neumentix works over time to improve focus.



FIGURE 2¹⁶



11% ↑

Those taking Neumentix achieved an 11% improvement in focus at day 90 over baseline levels



WHAT IS NEUMENTIX?

Neumentix is a water-extracted natural ingredient sourced from spearmint that is selectively bred to be high in polyphenols such as rosmarinic acid. This exciting cognitive ingredient is targeted to support cognitive performance, specifically focus and working memory, without disrupting sleep at night. These benefits are clinically supported for healthy young adults as well as older individuals with age-related memory issues.

Kemin developed Neumentix from patented, non-GMO, spearmint plant lines. These plants are grown on family farms in the USA in accordance with good agricultural and sustainable farming practices. In fact, Kemin's spearmint lines are the first spearmint to be certified sustainably grown in the USA.

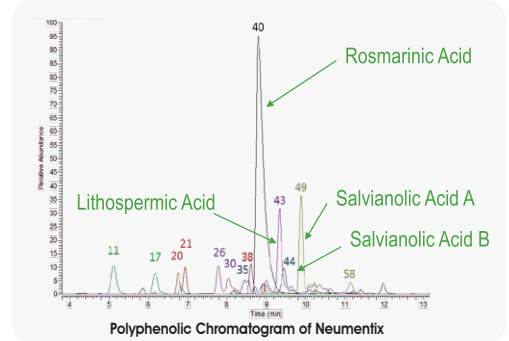
These special plants serve as the source for this innovative dietary ingredient. A patented drying technology, followed by a gentle water-extraction method, preserves and maintains the more than 50 natural phenolic constituents in the plant. The resulting extract is dried and undergoes rigorous quality testing prior to release.



NEUMENTIX POLYPHENOLS

The family of polyphenols includes compounds such as anthocyanins found in blueberries, cocoa flavanols, and stilbenes such as the resveratrol found in red wine, as well as the types of polyphenols in Neumentix. Salvianolic, lithospermic and caftaric acids are among the more than 50 phenolic compounds¹⁷ (Fig 3) that are naturally present in Kemin's selectively bred spearmint plants KI110 and KI42. Additionally, Neumentix contains higher levels of rosmarinic acid than those typically found in the commercial mint sold in the grocery store.¹⁸ The synergy between these bioactive constituents likely contributes to the clinical benefits of Neumentix.

FIGURE 3

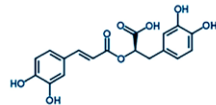


NEUMENTIX POLYPHENOLS CAN ACT IN SEVERAL WAYS

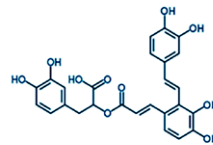
The key polyphenolic constituents identified in Neumentix (Fig 4) have been studied to determine how they may work to promote cognitive performance. Research suggests that these polyphenols are capable of improving cognitive performance in humans through at least four potential mechanisms of action:¹⁹ i) reduction in oxidative stress; ii) increase in acetylcholine, a neurotransmitter actively involved in learning and memory processes; iii) neurogenesis, promoting the healthy growth of new neurons; and iv) neuroprotection, the ability to help keep neural cells healthy.



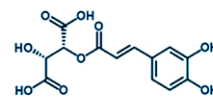
Figure 4 Neumentix Polyphenols



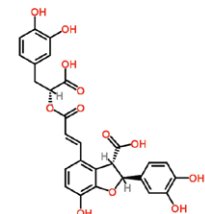
Rosmarinic Acid



Salvianolic Acid A



Caftaric Acid



Lithospermic Acid



**REDUCE
OXIDATIVE STRESS**



**INCREASE
NEUROTRANSMITTER LEVELS**



**PROMOTE
NEW NEURONAL GROWTH**



**PROTECT
NEURONS IN THE BRAIN**

WHY CHOOSE NEUMENTIX?

Consumers are interested in cognition²⁰, with their number one concern being “staying mentally sharp”.²¹ They also realize that in many areas of mental performance, including focus, they may not be performing as well as they used to. In fact, research suggests that for several domains of cognition, peak performance likely occurs in one’s 20s.²² Hence, a more natural and gradual approach to improvement rather than a quick fix may be important for consumers looking for trusted solutions that are scientifically-backed, safe, and natural, and offer sustainable benefits to meet cognitive demands.



NEUMENTIX SUPPORTS WORKING MEMORY

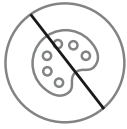
Improvement of working memory is one of the unique benefits of Neumentix. Working memory is part of short-term memory that allows for the storage and manipulation of information. It is controlled by the prefrontal cortex and hippocampus. Working memory is a critical cognitive function and is closely associated with cognitive abilities such as sustained attention and concentration. Due to the nature of working memory, improvements in this domain will likely help improve one’s ability to manage workloads and improve productivity.

This working memory benefit was recognized in a randomized, double-blind, placebo-controlled clinical trial where participants between the ages of 50 and 70 with age-related memory impairment took either placebo or 900 mg of Neumentix for 90 days. A 15% improvement in overall quality of working memory and a 9% improvement in accuracy in spatial working memory over placebo were observed.²³ The clinical relevance of these findings is noteworthy since research suggests that as we age working memory can begin to decline by about 5-10 percent per decade starting as early as in our 20s.²⁴





Non GMO



No Artificial Colors or Preservatives



Plant Based



Water Extracted



World Friendly



Vegetarian



US GRAS



Gluten Free

NEUMENTIX IS SAFE AND WELL-TOLERATED

Consumers today expect safe and quality ingredients. Neumentix (standardized to a minimum of 14.5% rosmarinic acid) is recommended for healthy adults at a dose of 900 mg taken once daily, preferably with meals in the morning. Neumentix is affirmed as Generally Recognized As Safe (GRAS).²⁵ The four human clinical trials lasting between 15 and 90 days^{16,23,26,28} did not report product related adverse events.



NEUMENTIX IS STABLE AND EASY TO INCORPORATE INTO DELIVERY FORMATS²⁹

Neumentix is water soluble, stable during processing at a pH between 2 and 7, and fully recoverable at temperatures up to 300° F (149° C), which makes it easy to use in various delivery formats, including vegetable juices, coffee/tea, beverage drink sticks, effervescent, chews/gummies, baked goods, softgels and capsules.^{27,29}

TO READ MORE ABOUT THE FOCUS OUTCOMES IN THIS STUDY IN NUTRITION RESEARCH
[CLICK HERE.](#)

TO READ MORE ABOUT THE REACTION PERFORMANCE OUTCOMES IN THIS STUDY IN INTERNATIONAL SOCIETY OF SPORTS NUTRITION
[CLICK HERE.](#)



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REFERENCES

1. Kemin/DSM A&U Study
2. <https://www.cnbc.com/2018/07/18/video-game-industry-is-booming-with-continued-revenue.html>
3. Falcone, P., et al. (2018) Effects of Natural Nootropic Spearmint Extract on Physical Performance in Young, Healthy Individuals. *Int Soc. Sports Nutr.* 90(c):1-4
4. Spradley BD, Crowley KR, Tai CY, et al. *Nutr Metab (Lond)*. 2012; 9:28
5. Hoffman, J. R., et al (2009). *J Int Soc Sports Nutr* 6: 2.
6. Hoffman, J. R., et al (2010). *J Int Soc Sports Nutr* 7: 39.
7. Spradley, B. D., et al (2012). *Nutr Metab (Lond)* 9: 28.
8. Hilvoorde, I.v. and N. Pot, Embodiment and fundamental motor skills in eSports. *Sport, Ethics and Philosophy*, 2016. 10(1): p. 14-27.
9. Jenny, S.E., et al., Virtual (ly) athletes: where eSports fit within the definition of "Sport". *Quest*, 2017. 69(1): p. 1-18.
10. Wagner, M.G. On the Scientific Relevance of eSports. In *International conference on internet computing*. 2006.
11. Kosinski, R. J. (2008). *Clemson University* 10.
12. Delignières, D., et al (1994). *Journal of Human Movement Studies* 27(4): 173-188.
13. Guizani, S. M., et al (2006). *Journal of Sports Medicine and physical fitness* 46(2): 344.
14. Beise, D. and V. Peaseley (1937). *Research Quarterly. American Physical Education Association* 8(1): 133-142.
15. Falcone, P. et al. In: *International Society of Sports Nutrition*, 2017, Phoenix, AZ.
16. Falcone, P. et al. (2019) The attention-enhancing effects of spearmint extract supplementation in healthy men and women: A randomized, double-blind, placebo-controlled, parallel trial. *Nutrition Research*, 64, 24-38.
17. Cirlini, M. et al. (2016) Phenolic and Volatile Composition of a Dry Spearmint (*Mentha Spicata* L.) Extract. *Molecules*, 21(8).
18. Narasimharoomorthy, B., et al. (2015) Differences in the chemotype of two native spearmint clonal lines selected for rosmarinic acid accumulation in comparison to commercially grown native spearmint. *Industrial crops and Products*, 63, 87-91.
19. KHTL-017-134 (TL-16-00075) Key Polyphenols in Neumentix Can Act in Multiple Ways to Support Cognitive Performance. The MOA claims are based on in-vitro/animal/clinical data with Neumentix™ and a review of the literature on the key phenolic constituents present in Neumentix™.
20. Kemin AU data, NMI – Brain Health Study #6503.
21. David, P. & Gelfeld, V. (2014) AARP Brain Health Research Study 2014, AARP Research.
22. Park, D.C., & Reuter-Lorenz, P. (2009) The adaptive brain: Aging and neurocognitive scaffolding. *Annual Review of Psychology*, 60, 173-196.
23. Herrlinger, K. et al. (2018) Spearmint Extract Improves Working Memory in Men and Women with Age-Associated Memory Impairment, *The Journal of Alternative and Complementary Medicine*, 24, 37-47.
24. Wesnes, K. The Cognitive Drug Research Computerised Assessment System: Application to clinical trials. In: de Deyn P, Theiry E, D'Hooge R, eds. *Memory: Basic Concepts, Disorders and Treatment*. Vol Leuven: Uitgeverij Acco, 2003, 453-472.
25. KHTL-017-139 (TL-17-00033) GRAS Status for Neumentix Phenolic Complex K110-42.
26. Nieman et al. (2015). *Functional Foods in Health and Disease*, 5, 165-187) evaluated healthy men and women between the ages of 50 and 70 with self-reported memory issues. Please contact Kemin for details on clinical findings.
27. KHTL-017-122 (TL-14-00063) Stability of Neumentix Phenolic Complex K110-42.
28. Ostfeld, I., Ben-Moshe, Y., Hoffman, M. W., Shalev, H., & Hoffman, J. R. (2018). Effect of Spearmint Extract Containing Rosmarinic Acid on Physical and Executive Functioning After a Tactical Operation. *Journal Of Special Operations Medicine: A Peer Reviewed Journal For SOF Medical Professionals*, 18(4), 92-96.
29. KHTL-017-130(TL-16-00002) Neumentix Formulator's Guide

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Recommended conditions of use: * 900 mg per day of Neumentix Phenolic complex K110-42, typically taken in the morning with breakfast, by healthy adults. Cognitive focus and physical performance improvements were observed after 30 to 90 days of continued use. This product is not intended/recommended for children. If pregnant, nursing, under a physician's care or taking medication, consult your health care professional before use. For references and/or more information about Neumentix, please contact Kemin at <https://www.kemin.com/en/north-america/products/neumentix>.

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