

ProtoFocus™ with Cera-Q™

TECHNICAL SUMMARY

ProtoFocus™ features Cera-Q™, a unique combination of peptides derived from silk protein. Cera-Q's unique structure allows it to easily bind to proteins present in the brain and impact their function in such a way that positively affects cognition.* Cera-Q™ has been clinically evaluated in children and adults and has been shown to enhance normal brain activities including learning, attention, focus and information retention.*

Composition: Cera-Q™ is a unique blend of functional peptides derived from the hydrolysis of *Bombyx mori* silk fibroin. The molecular weight range of peptides typically found in Cera-Q™ is 500-5,000 DA. These peptides are constituted of repetitive sequences of amino acids, mainly glycine, alanine and serine.

Allergen and Additive Disclosure: Not manufactured with yeast, wheat, gluten, soy, milk, egg, fish, shellfish or tree nut ingredients. Produced in a GMP facility that processes other ingredients containing these allergens.

Delivery Form: Chewable tablet

ROLE AS NUTRIENT/FUNCTION

The functions of Cera-Q™ peptides are not fully elucidated. However from *in vitro* and studies performed on animal models, it is postulated that the distinctive alanine-glycine sequences found in Cera-Q™ allow these peptides to form a ribbon-like structure called beta-sheet. This unique conformation of Cera-Q™ peptides may explain its ability to interact with amyloid beta peptide in cells and limit its effects.* Cera-Q™ peptides may also help maintain healthy acetylcholine levels in the brain.*

NATUROKINETICS®

Liberation: As a chewable tablet, Cera-Q™ peptides are released during mastication of the tablet.

Due to the complex nature of the Cera-Q™ peptide blend, pharmacokinetic studies could not be done to evaluate the absorption, distribution, metabolism and elimination of this blend of peptides. However, by extrapolation of known mechanisms of peptide digestion, the following Naturokinetics® behavior can be expected.

Absorption: It is well established that some peptides can reach hepatic portal circulation intact after intestinal absorption.

Distribution: There are no published data regarding the fate of Cera-Q™ peptides once they reach the bloodstream. There are no direct published data confirming that Cera-Q™ peptides cross the blood-brain barrier; however, in an open label, non-controlled, clinical study on four healthy young adults receiving 400 mg/day of Cera-Q™ for three weeks, SPECT brain images showed a significant increase (vs. baseline, $p < 0.05$) in Tc uptake in the parahippocampal gyrus and medial temporal areas. These images suggest the existence of increased blood flow and glucose consumption in these areas of the brain that are typically associated with learning and memory.

*These statements have not been evaluated by the FDA. This product is not intended to diagnose, treat, cure, or prevent any disease.

Supplement Facts

Serving Size 1 Chewable Tablet

	Amount Per Serving	% Daily Value
Calories	5	
Total Carbohydrate	1 g	< 1%*
Silk Protein Hydrolysate Complex	200 mg	†

* Percent Daily Values are based on a 2,000 calorie diet.

† Daily Value not established.

Other ingredients: Xylitol, Organic Turbinado Sugar, Cellulose, Organic Cocoa Powder, Organic Gum Acacia, Sorbitol, Natural Flavors, Silica and Stevia Leaf Extract (Rebaudioside A).

- **Enhances Focus and Attention***
- **Supports Memory Retention***

SUGGESTED USAGE: Adults and children ages 7 and up, chew 1 tablet twice daily.

Metabolism: Cera-Q™ peptide metabolism is expected to be similar to that of other proteins with respect to entering the bloodstream. They may be used for energy or their constituent amino acids can be recycled to synthesize other compounds. Glycine, alanine and serine are the main amino acids found in Cera-Q™. Glycine is used for the synthesis of creatine, glutathione, porphyrins and purines. Alanine and serine are glutamate precursors, and serine is also used to synthesize ethanolamine and choline.

Elimination: Cera-Q™ elimination is expected to be similar to that of other proteins entering the bloodstream, with nitrogen being removed from the body via the urea cycle in the liver and further excretion into urine.

CLINICAL VALIDATION

- Cera-Q™ was successfully used in two randomized, double-blind, placebo-controlled studies in healthy school-aged children for up to 16 weeks at a daily dose of 400 mg. In the first study, using a connecting numbers test, children in the Cera-Q™ group were able to significantly improve their speed and make fewer mistakes after 16 weeks of supplementation ($p < 0.05$ vs. baseline).* In the second study, over a 4 week period, in children as young as 7, Cera-Q™ supplementation led to significant memory test improvements in the domains of immediate recall, delayed recall, direct copying, immediate figure recall, and delayed figure recall ($p < 0.001$ vs. baseline).* Cera-Q™ was also successfully clinically evaluated in healthy high school and college students.
- Cera-Q™ was also clinically tested in two randomized, double-blind placebo-controlled studies in healthy adults. The largest study encompassed 99 healthy volunteers receiving 200 mg or 400 mg

Cera-Q™ per day for 3 weeks and demonstrated significant dose-dependent improvement of memory testing ($p < 0.05$ vs. baseline and placebo).* (Figure 1)

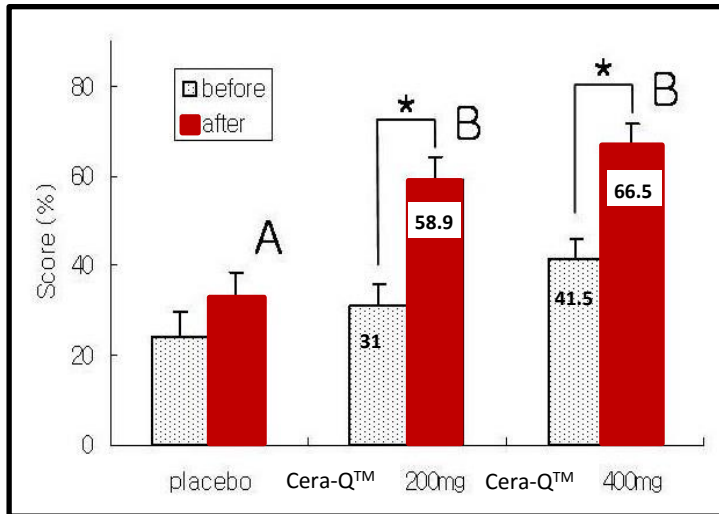


Figure 1: Increased memory recall efficiency by Cera-Q™. The values were represented as mean \pm S.E.M. The scores before and after administration of Cera-Q™ were compared using paired t-tests, and significant differences are shown as * ($p < 0.05$). Relationship among placebo, 200 mg of Cera-Q™, and 400 mg of Cera-Q™ groups were analyzed using one-way ANOVA (Tukey's multiple comparison test), and their statistically significant differences are shown as different characters (A and B) ($p < 0.05$). Adapted from Lee et al. 2004.

SAFETY INFORMATION

Tolerability: In clinical studies, Cera-Q™ was well tolerated.

Contraindications: No known contraindications.

INTERACTIONS

Drug Interactions: No known drug interactions.

Supplement Interactions: No known supplement interactions.

Interaction with Lab Tests: No known interaction with lab tests.

STORAGE

Store in a cool, dry place after opening.