

A form of choline for brain, nerve health, and muscle function*

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WHAT IS GPC LIQUID?

GPC, or L-alpha-glycerylphosphorylcholine, is a source of choline, a semi-essential nutrient most well-known for supporting brain health and mitochondrial function, but is emerging as a potential ergogenic aid.* Choline, found naturally in egg yolk, milk, and liver, acts as a building block for cell membrane phospholipids and the neurotransmitter acetylcholine.¹ GPC Liquid by Designs for Sport comes in a liquid that supplies 600 mg of GPC per serving size and allows for calibrated and flexible serving sizes.

FORMULA HIGHLIGHTS

- Offers 600 mg of GPC (glycerophosphocholine from sunflower lecithin) per serving
- Gluten-free, dairy-free, soy-free; non-GMO
- NSF Certified for Sport®



WHY IS CHOLINE SUPPLEMENTATION IMPORTANT?

Choline is made endogenously but not in sufficient amounts to meet biological needs.¹ Certain genetic polymorphisms, aging, and pregnancy may require a higher daily intake of choline.² The recommended adequate intake (AI) of choline for women is 425 mg/day and 550 mg/day for men.³ However, it is estimated that low consumption is common, according to data from the 2009 to 2012 National Health and Nutrition Examination Survey (NHANES; n = 16,809) which reported that only 10% of participants 2 years of age and older consumed the recommended AI of choline.⁴ In addition, The Nurses' Health Study of 1,477 healthy women aged 30 to 55 found

that 95% of women had a choline intake of 411 mg/day or less, suggesting that women of this population are not meeting the suggested intake.² Based on the critical roles choline plays in the body, such as neurotransmission, cellular membranes, and muscle health, low intake may impact systemic health.¹⁻⁴

SUPPORTS ATHLETIC PERFORMANCE*

GPC is a precursor to the neurotransmitter acetylcholine, which supports many bodily functions, including brain health, muscle contractions, muscle strength, and power output.⁵⁻⁸ Choline plays a role in mitochondrial health and adenosine 5' triphosphate (ATP) production through a variety of mechanisms.⁹⁻¹¹ It is a component of phosphatidylcholine, a constituent of mitochondrial membranes, along with its role in the inner mitochondrial membrane where it influences oxygen consumption and ATP production.⁹⁻¹¹

One double-blind placebo-controlled study evaluated the effects of GPC (600 mg/day, taken as 300 mg in the morning and 300 mg in the night) for six days on isometric strength in 13 healthy college-aged men. The GPC group experienced significantly greater isometric pull peak force in their thighs from baseline than the placebo group.⁵

Another double-blind placebo-controlled study looked at the impact of seven days of combined supplementation with GPC (300 mg), branched-chain amino acids (8 g), and L-citrulline (6 g) on exercise performance in 30 trained cyclists.⁷ The researchers found that the supplemental group had significantly improved peak power output (11%) and increased the time to fatigue (36.2%) during a 20 km time trial compared to the placebo group.⁷ These studies suggest the potential role of GPC as an ergogenic aid, especially when combined with other performance-supporting supplements.^{5,7,8}

MAY SUPPORT MUSCLE HEALTH*

Growth hormone (GH) plays a central role in anabolism, supporting the growth of muscles.¹² GPC has shown the ability to help maintain healthy GH status in clinical studies.^{12,13} One double-blind, placebo-controlled study

evaluated seven men who supplemented with 600 mg of GPC one time, 90 minutes before resistance exercise.¹² Key findings of this study included a significant increase in serum GH levels post-exercise in the GPC group (44-fold) compared to the placebo group (2.6-fold), suggesting a role of GPC in muscle development and recovery. Additionally, peak force production was also 14% higher in the bench press of the GPC group compared to the placebo group.¹² Another notable but also small, double-blind, randomized study explored the effects of a single intake of 1,000 mg of GPC or placebo on growth hormone and fat oxidation in eight healthy men.¹³ The findings indicated that when taking GPC, participants experienced increased free choline levels, growth hormone, and markers of hepatic fat oxidation, while no changes were observed when taking the placebo.¹³ Although these studies are small, they point to the potential role of GPC

in supporting growth hormone and muscle health; larger studies would be ideal to further evaluate these roles.*

BENEFITS*

- Supports healthy choline status²⁻⁴
- Supports muscle power output^{5,7}
- Supports cognition and a healthy memory^{6,8}
- Supports endurance⁷
- Supports mitochondrial health⁹⁻¹¹
- May support growth hormone and muscle health^{12,13}

HOW TO TAKE

Take 2 mL (approx. 2 droppers full) per day. To help optimize workouts, take 2 mL 20 minutes prior to performance.*



SUPPLEMENT FACTS

Serving Size 2 mL (approx. 2 droppers full)
Servings Per Container about 30

Amount Per Serving	% Daily Value
Glycerophosphocholine (from sunflower lecithin)	600 mg *

*Daily Value not established.

Other Ingredients: Vegetable glycerine, purified water.

SUPPORTS BRAIN FUNCTION, FOCUS & MEMORY*

SUPPORTS PRODUCTION OF DOPAMINE, SEROTONIN, AND GABA*

AIDS IN MITOCHONDRIAL FUNCTION DURING OXIDATIVE STRESS*



 SOY-FREE

 GLUTEN-FREE

 DAIRY-FREE

 0 GRAMS SUGAR

 NON-GMO

 HIGHLY ABSORBABLE*

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

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