Tri-Fortify®

Published research proves intracellular absorption

Researched Nutritionals®
solutions for life

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

Supplement Facts

Serving Size: 1 teaspoon (5 mL)
Servings per Container: Approx. 48

	Amount Per Serving	% Daily ** Value
Calories	30	
Total Fat	1 g	1%
Vitamin C (Ascorbic Acid)	50 mg	56%
Reduced Glutathione	450 mg	†

** Percent Daily Value based on a 2,000 calorie diet
† Daily Value not established.

Other Ingredients: Glycerin, medium chain triglycerides, phospholipids (soy), natural flavor.

Contains: Ingredients partially derived from soy and tree nuts (coconut).

Manufactured without milk, eggs, fish, crustacean shellfish, peanuts, wheat and gluten. Produced in a facility that may process other ingredients containing these allergens.

Clean Formula, Easy to Take

Squeeze out of tube, hold in mouth, swallow

Suggested Use: As a dietary supplement, gently squeeze the tube to fill 1 teaspoon (5 mL). Hold under tongue for 30-60 seconds, and then swallow. Additional doses may be taken.

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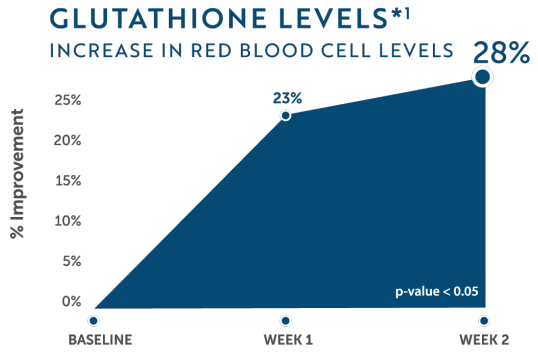
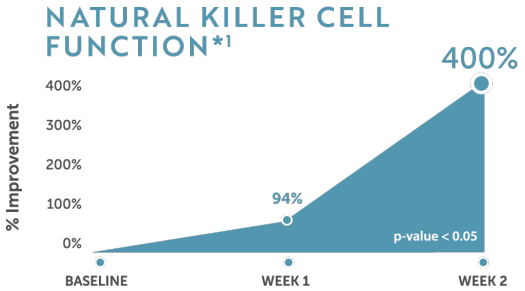
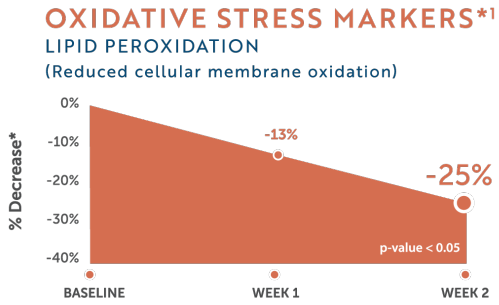


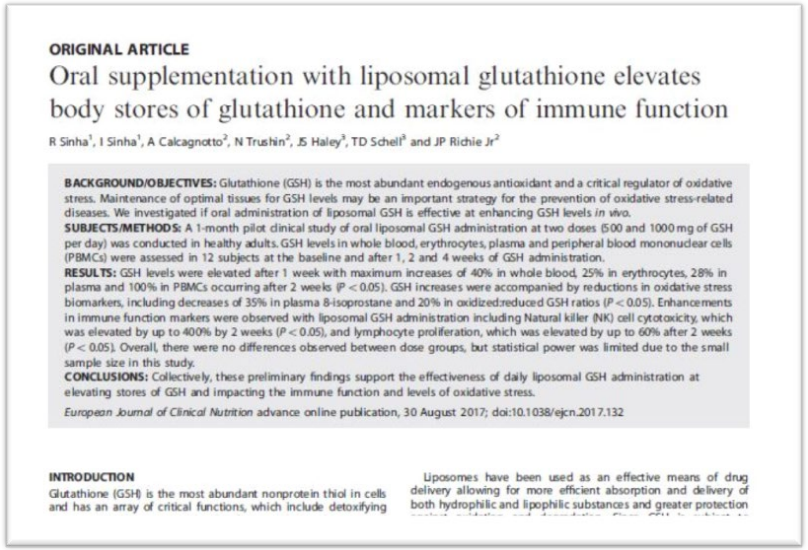




Published Research

Penn State University

Oral supplementation with liposomal glutathione elevates body stores of glutathione and markers of immune function. Sinha R, Sinha I, Calcagnotto A, et al. *Eur J Clin Nutr.* 2018;72(1):105-111



ORIGINAL ARTICLE

Oral supplementation with liposomal glutathione elevates body stores of glutathione and markers of immune function

R Sinha[1], I Sinha[1], A Calcagnotto[2], N Trushin[2], JS Haley[3], TD Schell[3] and JP Richie Jr[2]

BACKGROUND/OBJECTIVES: Glutathione (GSH) is the most abundant endogenous antioxidant and a critical regulator of oxidative stress. Maintenance of optimal tissues for GSH levels may be an important strategy for the prevention of oxidative stress-related diseases. We investigated if oral administration of liposomal GSH is effective at enhancing GSH levels *in vivo*.
SUBJECTS/METHODS: A 1-month pilot clinical study of oral liposomal GSH administration at two doses (500 and 1000 mg of GSH per day) was conducted in healthy adults. GSH levels in whole blood, erythrocytes, plasma and peripheral blood mononuclear cells (PBMCs) were assessed in 12 subjects at the baseline and after 1, 2 and 4 weeks of GSH administration.
RESULTS: GSH levels were elevated after 1 week with maximum increases of 40% in whole blood, 25% in erythrocytes, 28% in plasma and 100% in PBMCs occurring after 2 weeks ($P < 0.05$). GSH increases were accompanied by reductions in oxidative stress biomarkers, including decreases of 35% in plasma 8-isoprostane and 20% in oxidized:reduced GSH ratios ($P < 0.05$). Enhancements in immune function markers were observed with liposomal GSH administration including Natural killer (NK) cell cytotoxicity, which was elevated by up to 400% by 2 weeks ($P < 0.05$), and lymphocyte proliferation, which was elevated by up to 60% after 2 weeks ($P < 0.05$). Overall, there were no differences observed between dose groups, but statistical power was limited due to the small sample size in this study.
CONCLUSIONS: Collectively, these preliminary findings support the effectiveness of daily liposomal GSH administration at elevating stores of GSH and impacting the immune function and levels of oxidative stress.

European Journal of Clinical Nutrition advance online publication, 30 August 2017; doi:10.1038/ejcn.2017.132

INTRODUCTION

Glutathione (GSH) is the most abundant nonprotein thiol in cells and has an array of critical functions, which include detoxifying

Liposomes have been used as an effective means of drug delivery allowing for more efficient absorption and delivery of both hydrophilic and lipophilic substances and greater protection

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Why is Intracellular Glutathione Absorption Essential?

- Glutathione plays major roles in the different intracellular compartments[1]
  - Mitochondria
    - mitochondrial glutathione depletion induces increased mitochondrial ROS (reactive oxygen species) exposure, which is implicated in the pathogenesis of many liver diseases
    - plays a key role in regulating cell death
  - Cell Nucleus – glutathione is a key regulator of healthy cellular division

- Highest Levels of Glutathione are in red blood cells (intracellular) while the concentration in plasma is substantially lower[2]

- Lungs are clearly adversely affected by both reduced intracellular and extracellular glutathione[2]

- Intense exercise damages red blood cells due to increased generation of reactive oxygen species (ROS)[2]

- **Testing just whole blood glutathione levels does not adequately reflect the potential intracellular damage as a result of high oxidative stress levels[2]**
  - Most commercial labs "estimate" glutathione by looking at oxidative stress markers in plasma.
    The published Tri-Fortify® research measured reduced glutathione levels within the cell, the gold standard.

[1] Glutathione: Overview of its protective roles, measurement, and biosynthesis. Henry Jay Forman et al. *Mol Aspects Med. 2009; 30(1-2): 1–12.*
[2] Red Blood Cell and Whole Blood Glutathione Redox Status in Endurance-Trained Men Following a Ski Marathon. Eve Unt et al. *J Sports Sci Med. 2008 Sep; 7(3): 344–349*

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The State of Glutathione Published Research

- Much confusion exists regarding glutathione absorption, especially intracellular absorption
- Due to the cost of human research & inability of most nutritional products to demonstrate the actual intracellular absorption, very few products are backed by *peer-reviewed published research*.
- The others rely on marketing puffery, including liposome size (which is only one element in the intricate liposomal manufacturing process)

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Two Human Published Research Studies

Tri-Fortify® - Significant results in just 2 weeks

	Tri-Fortify®[2]	Setria®[1]
Natural Killer Cell Function	+400% in 2 weeks 450mg/day	+200% in 6 months 1,000mg/day
Intracellular Glutathione	+28% in 2 weeks 450mg/day	+35% in 6 months 1,000mg/day
Daily Dose	450mg	1,000mg

[1] Randomized controlled trial of oral glutathione supplementation on body stores of glutathione. Richie JP Jr, Nichenametla S, Neidig W, Calcagnotto A, Haley JS, Schell TD, Muscat JE *European Journal of Nutrition. May 2014: 1436-6207.*
Setria® is a registered trademark of Kyowa Hakko U.S.A., Inc.

[2] Oral supplementation with liposomal glutathione elevates body stores of glutathione and markers of immune function. Sinha R, Sinha I, Calcagnotto A, et al. *Eur J Clin Nutr*. 2018;72(1):105-111

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Tri-Fortify® Stability & Packaging

- **No refrigeration required**
- **24-month stability**
  - Tested by 3rd party lab
- **High Heat Stability – No refrigeration required**
  - Even when product was subjected to 104^0 and 75% humidity for 180 consecutive days, product still exceed label claim.
- **Daily Tube Opening – does it impact stability?**
  - 3rd party lab tested opening tube, withdrawing a daily dose. At end of study, product in tube still exceeded label claim
- **Packaging Quality**
  - 3rd party lab tested product for hexane and other potential leaching
    - high-quality packaging did not leach into product
  - Packaging does not include BPA or BPS

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Tri-Fortify® Packaging

Orange flavor

20 individual servings per box

8 fl oz 48 servings 5 fl oz 30 servings

Watermelon flavor

20 individual servings per box

8 fl oz 48 servings 5 fl oz 30 servings

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Science-based formulations backed by peer-reviewed published research.

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