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Electrolyte Synergy™

Optimal Cellular Hydration*

By Danielle C. Male, MS, CNS, LDN; Bri Mesenbring, MS, CNS, LDN; and David M. Brady, ND, DACBN, IFMCP, FACN

Electrolyte Synergy™ is a great-tasting electrolyte drink mix with a full spectrum of electrolytes, D-ribose, vitamin C, taurine, and bioflavonoids to support hydration, electrolyte balance, and antioxidant status.* This product may be ideal for children 4 years and older and adults with increased hydration and electrolyte needs, such as athletes, older adults, individuals with occasional diarrhea, those taking certain medications, and after exercise or sauna use.* It may be helpful for those who live or work in hot or humid climates where perspiration may be excessive.* This formula is offered in a great-tasting lemon-orange flavor.

Benefits*

- Supports proper hydration[2-5]
- Supports balanced electrolyte replacement[1-5]
- Supports energy production and recovery[1,6,8-11]
- Promotes athletic performance and muscle recovery[6,12-14,16]
- May help support a healthy immune response[14,17,23]
- Promotes antioxidant status[14,17,19,24-27]

Formula Highlights

- Delivers the main electrolytes required for proper fluid balance, including sodium, magnesium, potassium, and chloride*
- Vitamin C, citrus bioflavonoids, quercetin, and rutin to help promote antioxidant status and muscle function*
- D-ribose to promote adenosine triphosphate (ATP) energy production and muscle recovery*
- Great-tasting lemon-orange flavor, sweetened with stevia leaf
- Powdered formula, easily mixes into water or any other beverage, or it can be mixed with water and placed in an ice rack to make popsicles
- Gluten-free, dairy-free, soy-free; non-GMO

Supplement Facts

Serving Size 8 grams (approx. one scoop)
Servings Per Container 30

Amount Per Serving		% Daily Value
Calories		20	
Total Carbohydrate	6 g	2%**
Total Sugars	1 g	**
Includes 1 g Added Sugar		2%
Vitamin C (as Ascorbic Acid, Calcium Ascorbate, Magnesium Ascorbate)	1734 mg	1927%
Magnesium (as Di-Magnesium Malate, Magnesium Ascorbate)	80 mg	19%
Chloride (as Sodium Chloride)	170 mg	7%

Amount Per Serving		% Daily Value
Sodium (as Sodium Chloride)	110 mg	5%
Potassium (as Potassium Bicarbonate, Potassium Aspartate)	170 mg	4%
D-Ribose	757 mg	*
Taurine	379 mg	*
Citrus Bioflavonoids	14 mg	*
Quercetin	13 mg	*
Rutin	7 mg	*

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

Other Ingredients: Natural flavors, tapioca dextrin, silicon dioxide, steviol glycosides (from organic *Stevia rebaudiana* leaf), citric acid.

ELS240-6B

Electrolytes and Hydration

Electrolyte Synergy™ contains the electrolytes necessary to maintain proper fluid balance and conduct action potentials in the nerves, muscles, and other types of cells, including sodium, potassium, chloride, and magnesium.[1,2] Daily water losses occur from respiration, urination, bowel movements, and perspiration.[3] During physical exercise and exposure to hot weather, sweating is the largest source of electrolyte and water loss.[3,4] Drinking water with electrolytes, as featured in Electrolyte Synergy™, may be able to restore hydration more efficiently than water alone.[2-5] According to the American College of Sports Medicine, hydrating before, during, and after exercise is crucial in preventing dehydration (defined as more than a 2% loss in body weight due to water deficit) and electrolyte imbalances.[5] Fluid loss occurs in both intracellular and extracellular fluid compartments and can potentially reduce plasma volume.[3] An electrolyte imbalance can disrupt normal bodily functions and may lead to symptoms like headaches, fatigue, or even severe conditions such as mental confusion.[1,5] Electrolyte minerals are also essential for brain function, heart health, and muscle function.[1,6]

Electrolyte Synergy™ features sodium and potassium for optimal electrolyte support.* Sodium (Na) is the major extracellular cation that maintains normal extracellular fluid volume and cell membrane potential.[1] It also helps to stimulate thirst and water retention.[2,5] Hyponatremia is the most common electrolyte disorder, characterized by clinically low levels of sodium.[1] Potassium (K) is the major intracellular cation.[1] Sodium and potassium are exchanged across the cell membrane as part of active transport, specifically through the Na+/K+ pump, which maintains the cell membrane potential, regulates cell volume, and facilitates the active transport of other ions and nutrients in all tissues, including the brain. The Na+/K+ pump plays a central role in proper muscle contraction.[1,6] Potassium also plays a role in storing muscle glycogen, and when potassium levels are too low, it may reduce energy and endurance.[6]

A healthy Na/K ratio is associated with healthy aging and reduced risk of cardiovascular disease.[7] A high Na/K ratio is often associated with a diet high in processed and packaged foods and low in fruits and vegetables.[6] A cross-sectional study (n = 735) assessed the urinary Na/K ratio in older adults (≥ 65 years) and its association with hydration status and handgrip strength. Handgrip strength can be used to assess healthy aging, providing insights into limitations of daily life activities and determining adequate nutritional status.[6] Participants with higher values of urinary Na/K ratio had a twofold higher odds ratio for presenting with low handgrip strength. Moreover, dehydration was observed to be directly associated with low handgrip strength in older women.[6]

Magnesium is another critically essential mineral and electrolyte that is needed for ATP production, muscle function, and neurotransmitter release. Chloride is an important electrolyte and a predominant extracellular fluid anion.[1]

D-Ribose for Energy Production and Exercise Recovery*

D-ribose is a five-carbon molecule essential for synthesizing nucleotides, coenzymes, nicotinate adenine dinucleotide phosphate, and nucleic acids.[8] D-ribose is often referred to as "molecular currency" due to its critical role in supporting ATP energy production during periods of high energy demands, such as high-intensity exercises or in certain conditions like cardiovascular disease.[8-10] After prolonged or high-intensity exercise, it may take days for muscle ATP status to return to normal through the adenine salvage pathway or de novo ATP synthesis.[8] For athletes, this can result in excessive muscle fatigue, cramping, pain, and stiffness, or inability to recover sufficiently in the days following physical activity.[8,9,11]

The body may rely on D-ribose for an alternative metabolic pathway to generate ATP, as D-ribose can bypass the rate-limiting enzyme (glucose-6-phosphate dehydrogenase) required for ATP production.[8] This may help maintain energy production during heightened energy demands and support athletic muscle performance, recovery, and exercise metabolism.[8,9] Clinical studies also suggest that D-ribose may help mitigate the effects of oxidative stress in the body, particularly during and after exercise.[8,12]

Vitamin C to Promote Antioxidant Status*

Electrolyte Synergy™ includes vitamin C to promote antioxidant status and support exercise recovery.* Vitamin C is essential for collagen synthesis, which supports bone strength, normal soft tissue healing, and skeletal muscle function.[13,14] Ascorbic acid (vitamin C) also promotes the synthesis of norepinephrine from dopamine in adrenal chromaffin cells by serving as a cofactor for chromaffin granule dopamine beta-hydroxylase (DBH).[15] As a potent water-soluble antioxidant, vitamin C can scavenge reactive oxygen species (ROS).[14] This may help to attenuate the effects of oxidative stress associated with exhaustive exercise, particularly in non-trained athletes.[14] A cross-sectional analysis of 957 older women (aged 70 to 84) reported that a higher plasma vitamin C level was significantly correlated with higher muscle strength (handgrip strength), balance capability (standing on one leg with eyes open), and normal walking speed.[16]

Intense exercise can increase the production of ROS, free radicals, or reactive nitrogen species.[17,18] In the long term, exercise-induced oxidative stress can play a healthy role in the body by stimulating muscle regeneration and increasing the capacity of the endogenous antioxidant system.[17,18] However, in the short term, exercise-induced oxidative stress may exceed the body's antioxidant capacity, causing damage to cells and tissues.[17] This can impair normal muscle contraction and potentially lead to muscle fatigue and reduced athletic performance.[18] A meta-analysis of 18 randomized controlled trials (n = 313) investigated the effects of vitamin C following acute exercise. The individuals who received vitamin C exhibited reduced oxidative stress (lipid peroxidation) and inflammatory responses (interleukin-6) immediately after a single exercise session and between one and two hours post-exercise.[17] However, human clinical studies suggest that vitamin C supplementation may be more effective in helping to promote exercise performance and reducing oxidative stress in individuals with suboptimal vitamin C status.[17,19]

Taurine

Taurine is a sulfur-containing amino acid with activity across a broad range of tissues, including the cardiovascular system, immune system, central nervous system, and skeletal muscle.[20-22] Taurine also plays a role in maintaining proper fluid balance and regulating cell volume by acting as an osmolyte.[22] Interestingly, it is the most abundant amino acid present in leukocytes and granulocytes.[23] Taurine has been reported in ex vivo experiments to assist with the uptake and utilization of the calcium cation (Ca^{2+}) in the sarcoplasmic reticulum, which may partly explain why lower concentrations of taurine are associated with faster time to exhaustion in mice.[24,25] A meta-analysis was performed to evaluate the effectiveness of oral taurine supplementation on endurance performance in athletic participants. Compared to the placebo group, participants (N = 116) who received taurine at a daily dose of 1 to 6 grams exhibited a small to moderate improvement in endurance performance.[26]

These findings are corroborated by earlier work that supports the notion that taurine may help promote other variables of aerobic and anaerobic exercise, including performance, recovery, $VO2_{max}$, time to exhaustion, timed trials, muscle damage, peak power, and recovery at doses of at least one gram.[21] Further research is needed to investigate how lower doses of taurine — especially when combined with other ingredients — may impact exercise performance across different populations and timeframes. However, based on the ex vivo findings, taurine has been suggested to be "as ergogenic as caffeine,"[26] which may help support athletes seeking a competitive edge.*

Citrus Bioflavonoids, Quercetin, and Rutin

Vitamin C and bioflavonoids are found together in nature as they work synergistically.[27] For instance, citrus fruits, like lemons, oranges, limes, and grapefruits, are rich in both ascorbic acid and flavonoids.[28] The inclusion of quercetin and rutin in Electrolyte Synergy™ may help support the proper absorption and utilization of vitamin C in the body; they also work in synergy with it to help protect cells from oxidative stress and free radicals.[29] Quercetin is a flavonol found in many foods that are recognized for their health benefits, such as red and yellow onions, apples, olive oil, dark berries and grapes, capers, broccoli, salad greens like watercress and radicchio, and culinary herbs such as dill and cilantro.[30] Rutin, found in apples, buckwheat, and other plants, is a flavonoid that may help support healthy inflammatory responses and antioxidant status.[31] These bioflavonoids may help support immune health and promote a normal inflammatory response in times of acute or prolonged stress, such as chronic illness, physical or psychological trauma, overexertion, and intense exercise.[30-34]

Recommended Use: Mix 8 grams (approx. one scoop) in 10-12 ounces of water per day or as directed by your health-care practitioner.

For a list of references cited in this document, please visit:

https://www.designsforhealth.com/api/library-assets/literature-reference---electrolyte-synergy-tech-sheet-references

Dosing recommendations are given for typical use based on an average 150-pound healthy adult. Health-care practitioners are encouraged to use clinical judgement with case-specific dosing based on intended goals, subject body weight, medical history, and concomitant medication and supplement usage.

***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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