

elete Electrolyte Add-In

elete Electrolyte Add-In

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Cost effectively and easily supporting hydration for work safety and performance.

Overview/Purpose:

This paper will help safety managers and business owners/ managers to understand and effectively cope with the following problems:

- Low worker performance due to fatigue and/or heat injury
- Higher costs and potential community concern due to worker injury
- High cost of hydration products
- Cleaning time required for equipment used to dispense standard electrolyte beverages
- Potential workforce illness due to lack of cleaning or improperly cleaning coolers after dispensing sugar-based beverages
- Difficulties in storing standard electrolyte beverages
- Problems with diabetic workers or workers with other illnesses such as high blood pressure in consuming high sugar or high sodium electrolyte beverages
- Problems for general work population hydrating with high sugar electrolyte beverages in large quantities due to prolonged exposure to high heat and physically demanding conditions.

Problem: Providing Safe and Effective Hydration to Employees Working in Heat-Stress Conditions

Safety managers and employers have responsibility to protect the health of workers in potentially dangerous conditions as well as a financial responsibility to the business to cost effectively support worker performance and safety under those conditions if they exists. That being the case, it is critical to consider which of the available tools are essential, cost effective, beneficial and/or detrimental to the overall workforce.

It is generally recognized that employers need to ensure that sufficient and effective hydration be provided to employees working in conditions of heat stress or conditions that are physically demanding.

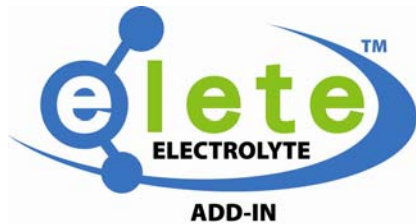
Problem: Sugars May Interfere with Extended Hydration

In the past, sports drinks or electrolyte beverages all contained very high levels of sugars, to the degree that those who are not trained in nutrition or hydration may have been led to believe that sugar is an essential component of hydration when you sweat. In fact, the sugar component of hydration drinks may actually work against the desire to hydrate after a certain point, therefore, leading to potential dehydration.

When workers have a high need for hydration throughout the day, their desire for consuming sweet beverages can wane once their tolerance for sugar consumption has been exceeded. The sugar component of these drinks also adds a significant level of additional cost, as well as storage and clean up concerns. The sugar component of sports drinks comprises the majority of the shipping weight and volume that contributes to storage space being used when these drinks are in concentrate form. Ready to consume beverages are even worse on cost and storage.

Problem: Sugars Create Ideal Conditions for Bacterial Growth in Hydration-Dispensing Systems

Sugar-based beverages, when exposed to the environment, provide ideal conditions for the growth of mold and bacteria (funk), meaning that coolers and other tools used to dispense these beverages need to



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be cleaned daily at the end of each work shift to avoid the risk of dysentery or other digestive illnesses. Further, an additional storage concern relating to bags of powdered sugar-based beverages is that if the packaging is punctured, they can be a food source and thus an attractant for rodents.

What are the essential components for heat tolerance and physical and mental performance necessary from hydration?

Hydration is more than just water. Hydration is the achievement and maintenance of proper fluid balance throughout the body down to the cellular level. The tools that the body uses to accomplish this are water and electrolytes. Electrolytes are charged elements that are water-soluble. They make the fluids that they dissolve in electrically conductive so that they can act as the body's wiring systems. They also give fluids something akin to a magnetic pull that one set of fluids can have toward another set of fluids. The body manipulates electrolyte levels and balance in different parts of the body to use this quality called osmolarity to shift and regulate the balance of fluids as well as other nutrients. The body also uses this charged quality of electrolytes as to act as a catalyst for almost innumerable essential reactions throughout the body. When these nutrients and/or fluids reach low levels fatigue or even life threatening injury can occur.

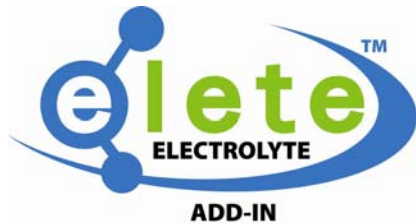
Magnesium, an essential electrolyte, for example, is essential for every form of energy conversion and utilization within the body. If calories are the gas in the tank, then electrolytes are the spark plugs and they are essential to the cooling system. Whenever the body loses fluids, it also loses essential electrolytes. This means that a work environment that increases the need for hydration also increases the need for electrolytes. Helping employees to maintain proper levels of essential electrolytes through the hydration being provided not only reduces risk of liability, but also helps employees maintain strength as well as overall physical and mental performance, ideally improving productivity and, therefore, return on labor investment.

The main electrolytes essential to hydration and physical performance are sodium, the least expensive electrolyte that is most abundant in most diets, potassium, magnesium, the most expensive electrolyte, calcium, and chloride. Chloride is the main negatively charged electrolyte in the body that balances the positive charge of the other electrolytes. Only a small amount of the calcium in the body is in dissolved electrolyte form.

Most sugar-based hydration products place the heaviest emphasis on sodium, where excess can actually be detrimental to the health of many workers. They also leave magnesium, which acts as the team captain of the electrolytes, out. Magnesium is essential to arranging all of the other electrolytes into their proper place and orchestrating their respective functions within the body. It is essential for all forms of energy conversion and utilization within the body as well as for the proper function of the nervous system.

Magnesium is to the muscles what calcium is to the bones. It is stored in the muscles as well as functional to the muscles and when the body needs magnesium for other functions, it robs it from the muscles. The heart is the hardest working muscle in the body, and heart tissue contains more magnesium than any other tissue. The heart is also the last place that the body will rob of magnesium because if you get a cramp or a spasm in the heart it is life threatening.

All forms of stress deplete the body of magnesium and the main food source for magnesium is green leafy vegetables, which are lacking in many diets. The journal, *Trace Elements and Electrolytes*, suggested that continuous magnesium supplementation might be necessary for athletes to maintain proper levels.



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Problem: Sugar and Salt Content May Be Problematic for Some Workers

It is also critical that hydration be clean and acceptably palatable in order for it to be consistently effective. It is also important that the hydration product provide benefit without harm to all of those who need it. Workers who have either diabetes and/or high blood pressure, which together or paired with other health concerns (high cholesterol) are now being termed Metabolic Syndrome X, can find it harmful to consume excessive levels of either sugar or salt.

When looking at the salt issue it is important to note that sodium is an essential nutrient that can be problematic if either excessive or inadequate levels are consumed. Sweat will increase the need for sodium, but levels of sodium in the sweat are not necessarily indicative of a need for sodium in the diet.

The body works to maintain homeostasis by absorbing more of what is deficient and excreting more of what is in excess. High levels of sodium in the sweat may indicate excessive levels in the diet, and low—or no—sodium in the sweat may be indicative of a deficiency. Sodium is also an essential nutrient that requires the aid of magnesium and potassium to function properly. Increasing potassium and magnesium levels in the diet may be as effective or more effective to maintaining health than reducing sodium for those who are concerned about a sodium imbalance in the body.

Sugar, a cost that is not required for maintaining safety

Calories are essential to the function of the body, but they are not essential to hydration or heat tolerance. It is generally accepted practice in most work organizations that workers are responsible to provide their own food and, therefore, calories. Any employer that decides to provide food for its employees chooses to take on significant additional expense. It is not generally considered the responsibility of the employer to provide calories to the employees as part of maintaining a safe work environment.

elete Electrolyte's Solution: Safe, Effective, Cost-Efficient Hydration and Electrolyte Replacement

elete, a division of Mineral Resources International, an American, family controlled company, provides multiple options for electrolyte replacement and electrolyte-fueled hydration to suit your specific needs.

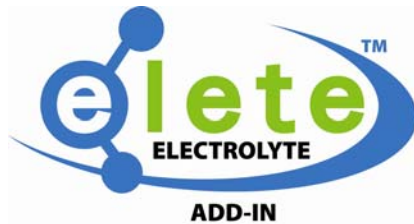
elete Electrolyte Add-In™ is a pure electrolyte concentrate that is very compact and cost effective, a 32-oz. bottle makes 96 gallons with a retail price of only \$40.00. That's only \$2.09 per five gallons mixed.

Clinically Documented

In a clinical study on hydration under arduous condition that was published in the journal *Wilderness and Environmental Medicine*, those who consumed water alone drank 74 percent more water to achieve the same level of hydration as those who had **elete Electrolyte Add-In** mixed as directed with all the water they consumed during the study.

Options for Palatability, Convenience and Value

Mixed as directed, **elete Electrolyte Add-In™** makes pure electrolyte water with only minimal flavor when good quality, good tasting water is available. **elete CitriLyte Add-In™**, our newest addition to the line up, contains citric acid from natural sources, which is essential to energy conversion through the Krebs cycle and provides a light tart flavor that makes the electrolyte water more palatable when less than perfect water is all that is available. **elete CitriLyte's** tart flavor is akin to the lemon wedge on your glass of water at a restaurant



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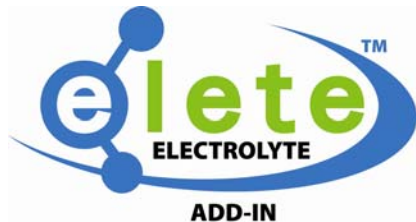
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In some areas, double or more the standard mix may be desirable to achieve sufficient tart flavor to compensate for the flavor of the available tap water. The **CitriLyte** version also contains zinc, which is essential for energy conversion, mental function, and the immune system.



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No Sugars, No Carbs, No Artificial Ingredients

Because both **elete Electrolyte Add-In** and **Citrilyte** are pure electrolyte concentrates, there are no sugars, no carbs, no artificial colors, flavors, or preservatives. Furthermore, both products have a two-year shelf life and can withstand a variety of temperature variations without any damage to the product.

Convenient for Mixing Large Quantities

Citrilyte is also our most convenient product for making large mixes because 2 ounces makes 5 gallons of standard mix. It is available in a 2 oz. bottle, a 4 oz., 32 oz. with a 1 oz cap and a gallon with an available 1 oz. measured pump. Both the original **elete Electrolyte Add-In** and the **CitriLyte Add-In** can be used as an extender for diluted sugar-based hydration products as well.

Lower Sodium Emphasis

Both **elete Add-In** and **elete Citrilyte** contain sodium, but have a much lower emphasis on sodium than the typical sports drink. Furthermore, the sodium in the products is balanced with the electrolytes magnesium and potassium that are required for sodium to function properly as an essential nutrient.

No Extra Clean Up Required

Pure electrolyte water made with either product requires no more clean up than if water alone were used in hydration dispensing systems and is just as stable as pure water.

The Convenience of a Consume As Needed Tablet

tablytes Balanced Electrolyte Tablets are not a beverage add in, but, rather, provide the full range of electrolytes in a tablet form that can be swallowed with water as needed. **tablytes** contain **elete** as an ingredient and also provide multiple forms of calcium for an electrolyte supplement that contains eight essential electrolytes as well as citrate, which is not a mineral, but acts as an electrolyte in the body. **tablytes** contain added salt in the form of sea salt with each tablet providing 150 mg of sodium per tablet where higher levels of sodium are desired.

To learn more:

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www.eletewater.com
<http://www.facebook.com/elete.electrolytes>
<http://twitter.com/eleteaddin>

References for this white paper are available upon request.