

# THE SCIENCE OF GATORADE®



## From elite athletes to everyday hard workers, no other hydration beverage is as tested as Gatorade

### Gatorade has an ideal formula to sustain hydration and performance

Over 40 years of research demonstrates that Gatorade contains an optimal balance of flavor, electrolytes and carbohydrates to keep your workers hydrated and fueled for optimal mental and physical performance.

#### Why Gatorade for your workers?

- Gatorade has been shown to increase endurance and manual work productivity in hard workers compared to a carbohydrate-free beverage.<sup>1,2,3</sup>
- Gatorade containing 110 mg of sodium per 8 oz. stimulates drinking to prevent dehydration, helps complete rehydration after hard work in the heat and helps fully replace electrolytes lost in sweat.<sup>4,5,6</sup>
- Gatorade, containing multiple types of carbohydrate such as glucose, fructose and sucrose, promotes fast water absorption and enhances rehydration.<sup>7,8</sup>

#### Why is Gatorade more effective than water?

- Plain water will not replace the electrolytes lost through sweat, nor will it replace the energy that working muscles need. Gatorade replaces both.
- Research shows that people will stop drinking water before they are properly hydrated, and the flavor in Gatorade promotes drinking.<sup>9</sup>

#### What is osmolality?

- Osmolality is an indicator of the total number of particles (e.g., sodium, carbohydrate) dissolved in a beverage.
- Beverage osmolality influences the movement of water across a membrane (e.g., the intestinal wall) such that water is pulled from a lower concentration of particles (lower osmolality) to a higher concentration of particles (higher osmolality).

#### Why is osmolality essential in a hydration beverage?

- Osmolality of a hydration beverage is an important factor, influencing water absorption and rehydration.
- Ingestion of a beverage with a higher osmolality reduces water absorption from the small intestine to the blood or even produces water secretion from the blood to the small intestine.



1. Roberts D., *Med Sci Sports Exerc* 40:5160, 2008. 2. Byrne C, et al., *Mil Med* 170:715-21, 2005. 3. Bailey SP, et al., *Mil Med* 173:187-192, 2008. 4. Passe, D.H., et al. *Appetite* 35:219-229, 2000. 5. Gonzalez-Alonso, J., et al. *Int J Sports Med* 13:399-406, 1992. 6. Vrijens, D.M.J. and Rehrer, N.J. *J Appl Physiol* 86:1847-1851, 1999. 7. Ryan, A.J. et al. *J Appl Physiol* 84:1581-1588, 1998. 8. Shi, X., et al. *Med Sci Sports Exerc* 27:1607-1615, 1995. 9. Passe DH. In: *Sports Drinks. Basic Science and Practical Aspects*, 2001, pp.45-88.



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## Why is sodium essential in a hydration beverage?

### Improves taste to promote consumption

Taste is the most important factor in determining whether individuals will actually drink hydration beverages. When a person is hot and sweaty, sodium improves taste and, thus, promotes consumption for adequate hydration. Research demonstrates that when people are hot and sweaty, they will consume more of a carbohydrate-electrolyte beverage like Gatorade – because of its taste – than just water.<sup>1,2</sup>

### Helps maintain a desire to drink

Sodium in the bloodstream is an important trigger for thirst. As Gatorade rapidly replenishes body fluid, the presence of sodium helps to encourage continued, voluntary fluid intake.<sup>2</sup>

### Helps speed absorption

Sodium, in the presence of glucose, facilitates the absorption of both fluids and glucose.<sup>3</sup>

### Promotes rehydration

Under conditions in which individuals may not drink enough and might therefore become dehydrated, Gatorade can help promote the rehydration process.<sup>4</sup> Optimal levels of sodium are key ingredients that differentiate Gatorade from other common beverages, such as water.<sup>5</sup>

## Beverage Comparison Chart: For Powder and Concentrate Products

	Gatorade	Sqwincher®	Water
<b>Total Carbohydrate</b> Carbohydrates provide energy to working muscles. A beverage containing 14 g of carbohydrate per 8 oz. (6%) is absorbed as fast as water. <sup>1,2</sup>	14g (6%)	17g (7.3%)	0
<b>Carbohydrate Type</b> A beverage containing multiple types of carbohydrate facilitates carbohydrate absorption followed by fluid absorption. <sup>3</sup>	• Glucose • Fructose • Sucrose	• Glucose • Fructose	N/A
<b>Calories</b> Consuming carbohydrate energy during physical labor can decrease injury and illness rates <sup>4</sup> and increase work rate. <sup>5,6</sup>	50	60	0
<b>Sodium</b> At least 110 mg of sodium per 8 oz. stimulates drinking to prevent dehydration, helps complete rehydration after hard work in the heat, and helps replace electrolytes lost in sweat. <sup>7,8,9</sup>	110mg	55mg	0
<b>Osmolality</b> Hyper-osmolality (>400 mOsm) slows fluid absorption and rehydration. <sup>2,10</sup>	290 mOsm	436 mOsm	0 - 40 mOsm

1. Rogers, J., et al. *Int J Sport Nutr Exerc Metab* 15:220-235, 2005. 2. Ryan, A.J., et al. *J Appl Physiol* 84:1581-1588, 1998. 3. Shi, X., et al. *Med Sci Sports Exerc* 27:1607-1615, 1995. 4. Roberts, D. *Med Sci Sports Exerc* 40:S160, 2008. 5. Cuddy, J.S., et al. *Med Sci Sports Exerc* 39:1004-1012, 2007. 6. Bailey, S.P., et al. *Mil Med* 173:187-192, 2008. 7. ACSM position *Stand. Exercise and fluid replacement*, 2007. 8. Gonzalez-Alonso, J., et al. *Int J Sports Med* 13:399-406, 1992. 9. Vrijens, D.M.J. and Rehrer, N.J. *J Appl Physiol* 86:1847-1851, 1999. 10. Leiper JB and Maughan RJ. *J Physiol* 373: 90P, 1986