Synthesis project

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Hydration and Sports Drinks in Competitive Cycling

In a sport that involves training for hours on end and traveling hundreds of miles in workouts, hydration is key. For competitive cyclists, carefully monitoring fluid intake and making good decisions about hydration are essential for success. Whether with water or sports drinks, most athletes have a specific method of hydration. There are enough choices of brands and flavors that it's easy to quickly develop a favorite. Athletes are prone to arguing over their favorite method of hydration, but a corresponding argument exists within the scientific and nutritionist communities. Experts argue over how much, and when, athletes should rehydrate, as well as what kind of hydrating agents are most effective. This paper will track hydration recommendations for elite athletes, with particular attention to cyclists.

Explains why hydration is a concern for athletes

Although many of the specifics of hydration fall under considerable controversy, studies definitively show that dehydration has a marked negative impact on athletic performance. Lance Armstrong, for example, notably collapsed during stage 12 of the 2003 Tour de France because of severe dehydration (Henry). Dehydration, which is defined as a >1% loss of body weight due to exercise, can come with hypotension—dangerously low blood pressure. This, in turn, can cause loss of vision, dizziness, fainting, and, in extreme cases, death. Body weight losses of even as little as 0.7% due to dehydration have been shown to have

Source: Lunsford Handbooks (Bedford/St. Martin's, 2016).
This project follows the style guidelines in the *MLA Handbook*, 8th ed. (2016).

adverse effects on athletes (Murray 542). However, in many cases, loss of sodium through sweating becomes more threatening than water loss. Sodium enables the body to retain water, and if an athlete sweats enough to lose a significant amount of sodium, he becomes trapped in a downward spiral—with every ounce he sweats, his ability to retain any remaining water deteriorates. After his 2003 stage 12, Armstrong noted, "Water's great, but you reach a point that you're just passing it through and if it doesn't contain the proper minerals and salts, it won't be absorbed" (Henry).

In a study conducted on candidates for the Canadian junior national hockey team, researchers measured the sodium losses of players over one-hour practice periods. Each player lost, on average, 2.26 +/– 0.17 grams of sodium, which contributed to an average body weight loss of 0.8%. Among these 41 men, over a third lost more than 1% of their body weight, even though they were given ample opportunities to drink and in fact replaced 58% of their water lost—during this one-hour period, without water breaks, body weight losses would have averaged almost 2% (Palmer and Spriet 263). At this point, dehydration begins to pass from the unwise to the dangerous. For an elite competitive cyclist, who will often train for many hours, dehydration is a constant threat. Cyclists' prolonged workouts make them even more susceptible to dehydration than "power-burst" athletes like hockey players, and the negative physiological impact of dehydration—noticeable for the hockey players even in this short workout—would be much more severe for cyclists.

There is little controversy as to the existence and seriousness of dehydration. However, experts recommend varied

Source: Lunsford Handbooks (Bedford/St. Martin's, 2016).

methods for dealing with it. The *British Journal of Sports Medicine* outlines two general approaches, each tailored to specific types of sports. One replacement method is to hydrate, using only water, whenever they are thirsty during exercise. The athlete, after his workout, is then free to use sports drinks for recovery purposes and electrolyte replacement. While this method does result in some degree of dehydration, exercise-associated hyponatremia (EAH), or overdrinking, is no longer a danger, and this method may better prepare athletes for competitive situations in which they will not be able to rehydrate until after performing. This method has been adopted by USA Track & Field, as well as the International Marathon Medical Directors Association. The other approach to hydration maintains that an athlete should attempt to replace 100% of body weight lost during exercise. The athlete should drink every fifteen to twenty minutes, preferably consuming supplemental sodium like that found in sports drinks; the sodium allows the athlete to retain water and allows for better nervous system communication. In this scenario, the athlete does not wait to become thirsty (the assumption is that a thirsty athlete is already dehydrated); instead, he drinks small amounts consistently, and his body weight losses are less than 1%. This approach has been adopted by the American College of Sports Medicine as well as the National Athletic Trainers' Association (Beltrami et al.).

Summarizes source's discussion of two main methods of hydration

Summarizes journal sources

Most cyclists are believers in the second method. In a sport that both requires alertness and demands performance for an extended amount of time, it makes sense to stay continuously hydrated. As for what to drink, online communities at both

Source: Lunsford Handbooks (Bedford/St. Martin's, 2016).

Offers evidence from cycling forums for cyclists' preferences

bikeforums.net and cyclingforums.com are filled with advocates for the use of sports drinks during exercise. There is some debate over which drink is most effective—Heed, Cytomax, Pro-Opti, Accelerade, GU20, and Gatorade are among the most popular—and how much to use (many people dilute or mix their drinks), but everyone seems to advocate one drink or another. Arielle Filiberti, a three-time junior national champion cyclist, says that her most horrific crash came at the end of a long ride when she ran out of both water and her preferred energy drink. Filiberti had been experiencing dizziness and light-headedness for some time, and as she was rounding a corner, she misjudged the turn and swung out too far into the road. She then swerved to avoid oncoming traffic, lost her balance, and skidded sideways off the road. Doctors found that Filiberti had lost around 3.5% of her body weight over a four-hour ride—almost five pounds of water. Furthermore, her reflexes were slow, and she was unable to focus her eyes either close up or far away—a result of electrolyte and sodium loss. She was put on a saline drip and hospitalized overnight (Filiberti). This kind of story is much more common than is safe or necessary. Thus for the competitive cyclist, it makes most sense to hydrate continuously through training.

Gives evidence from personal interview about need for cyclists to avoid dehydration

Beyond personal preferences for taste, a cyclist's primary concern in finding a sports drink generally seems to be sugar content. Brandon Marcello, the Director for Sports Performance at Stanford, says that for cycling, it is better to look for drinks with a higher proportion of fructose to glucose. Glucose has a higher glycemic index than fructose, which means that it is absorbed and delivered to muscles more quickly. Fructose takes longer than

Includes second personal interview

Source: Lunsford Handbooks (Bedford/St. Martin's, 2016).

glucose to be absorbed, but it also delivers energy at a constant rate for longer amounts of time and is generally a better option for cyclists. However, glucose gives sports drinks their supersweet flavoring, so it can be difficult to obtain an ideal balance; the closest match is Cytomax, which, with 13 grams of carbohydrates (primarily glucose and fructose), has only 3 grams of glucose. By comparison, the Gatorade Endurance Formula, which is touted as being the company's "it" drink for extreme endurance athletes, has 14 grams of carbohydrates, of which 12 are glucose (Marcello). So Cytomax seems to be a better option.

Draws conclusions for research

Experts agree on little with regard to hydration other than that it is important and that failing to hydrate properly can have disastrous results. With regard to methods of hydration and brand of sports drinks, there are enough options to be completely overwhelming. However, most competitive cyclists generally agree that more hydration is better than less, sports drinks with low sugar are beneficial, and body weight losses should be kept to a minimum. These methods, it seems, are the best way to maximize performance for competition.

Source: Lunsford Handbooks (Bedford/St. Martin's, 2016).

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