

Milk and Exercise: A Promising Combination

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The U.S. sports drink market is over a billion-dollar industry and growing. According to IRI Market Insights, sports drinks were one of the top 10 growth categories in 2007 with 8.4% more dollar sales and 5.1% more unit sales from the previous year.¹ While the effectiveness of these drinks in helping people recover after a strenuous workout may vary product-by-product, the nutrition needed to promote optimal recovery after exercise is well documented in scientific literature.

These nutrients include carbohydrates to refuel muscles; protein to reduce muscle breakdown and stimulate growth; and fluid and electrolytes to replenish what is lost in sweat and body heat and rehydrate the body. The key is to seek out foods and beverages that contain these nutrients in the appropriate amounts and consume them relatively soon after a workout.

Get Results With Milk

Low-fat and fat-free milks are emerging to be an equivalent or better choice compared to other beverages, specifically sports drinks and soy protein beverages with rehydrating the body after endurance exercise and helping to repair and rebuild muscles after resistance exercise.^{2,3,4} While the health benefits of milk are well-established, this specific benefit as an exercise recovery beverage is a relatively new avenue of exploration and has the potential to materialize into increased market share and demand for milk products. Much of the success seen in post-endurance and post-resistance exercise recovery may be due to milk's unique nutrient profile including its high electrolyte content, macronutrient content (carbohydrates, protein and fat) and energy density.^{2,3,4} In one study, subjects were given one of four beverages (low-fat milk, low-fat milk with added sodium, a traditional carbohydrate-electrolyte sports drink and water) following exercise. The total volume of fluid consumed equaled 150% of the sweat lost during exercise. Subjects remained in positive

fluid balance throughout the recovery period after drinking either the milk or the milk with added sodium with no differences reported, but returned to negative fluid balance one-hour after drinking the sports drink or water.² These results show milk can effectively rehydrate the body following endurance exercise. Other studies have found that fat-free milk is an ideal choice for muscle repair and gain after resistance exercise compared to both a soy protein beverage^{3,4} and a beverage containing only carbohydrates⁴. In one study, volunteers who consumed fat free milk after exercise gained more muscle and lost more body fat at the end of the 12-week training program compared to those who drank a soy protein beverage or a beverage containing only carbohydrates⁴. Milk's vantage remains unclear. Potential hypothesis may include the difference in amino acid composition or the difference in speed of digestibility or absorption. It is clear that the case for milk as an effective recovery beverage for adults looks promising.

On the Horizon: Refueling With Chocolate Milk

Currently, there is very little research to support chocolate milk specifically as a post-exercise recovery beverage. Results from studies on white milk may be applicable to that of chocolate milk, as

their nutrient profiles are nearly identical, barring extra carbohydrates found in chocolate milk; however, further research is warranted to support this theory. One study in support of low-fat chocolate milk compared its effectiveness on recovery between consecutive bouts of exercise to that of a commercially available carbohydrate/protein recovery drink and a commercially available fluid replacement drink.⁵ Participants exercised to exhaustion and then were immediately given one of the three beverages. After a two-hour recovery period, participants were given another equal serving of the beverage, rested for an additional two-hours (four-hours total) and were required to exercise to exhaustion a second time.⁵ The study specifically compared each beverage's effects on the time to exhaustion in the second bout of exercise. The results show time to exhaustion was significantly greater in chocolate milk compared to the carbohydrate/protein recovery drink and as effective as the commercially available fluid replacement drink.⁵ Compared to other beverages, chocolate milk provides the needed nutrients in a convenient

great tasting, relatively inexpensive package. While this initial research on chocolate milk as a recovery beverage is promising, additional studies are needed to help further support its role in exercise recovery. Therefore, the National Dairy Council and Milk PEP are co-funding three chocolate milk/exercise recovery

studies in adults to begin this year (2008) with completion slated for the end of 2009 or beginning of 2010. In the meantime, chocolate milk can be positioned as a post-exercise beverage for adults, as it includes several key nutrients needed to support recovery.



Endnotes

¹ IRI Times and Trends. CPG 2007 Year in Review. http://us.infores.com/filelib/timestrends/TT_January_2008_Year_in_Review.pdf

² Shirreffs SM, Watson P, Maughan RJ. Milk as an effective post-exercise rehydration drink. *British Journal of Nutrition*, 2007;98:173-180.

³ Wilkinson SB, Tarnopolsky MA, MacDonald MJ, MacDonald JR, Armstrong D, Phillips SM. Consumption of fluid skim milk promotes greater muscle protein accretion after resistance exercise than does consumption of an isonitrogenous and isoenergetic soy-protein beverage. *The American Journal of Clinical Nutrition*, 2007;85:1031-40

⁴ Hartman JW, Tang JE, Wilkinson SB, Tarnopolsky MA, Lawrence RL, Fullerton AV, Phillips SM. Consumption of fat-free fluid milk after resistance

exercise promotes greater lean mass accretion than does consumption of soy or carbohydrate in young, novice, male weightlifters. *The American Journal of Clinical Nutrition*, 2007;86:373-81.

⁵ Karp JR, Johnston JD, Tecklenburg S, Mickleborough TD, Fly AD, Stager JM. Chocolate Milk as a Post-Exercise Recovery Aid. *International Journal of Sport Nutrition and Exercise Metabolism*, 2006;16:78-91.