

The Science of Post-Workout Nutrition –Phase IIITM- Grade “A” Low Fat Milk with Attitude

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After endurance, strength, or power training, the body is primed for nutrient uptake into the muscle cells. So what should you feed your hungry muscles? An abundance of new research provides clues on what to consume after working out and it is clear that the best post-exercise formula: a) is a liquid meal with electrolytes to speed digestion and rehydrate the athlete, b) contains rapidly digesting carbohydrates that stimulate the anabolic hormone insulin and lead to glycogen (energy) replenishment, c) contains a rapid-digesting ‘complete’ protein to increase muscle building, decrease muscle breakdown, and enhance glycogen re-synthesis. Recently, it was reported in a scientific study that low-fat milk was equivalent to isolated whey, but superior to casein and soy for stimulating muscle building. Nature built the perfect ratio of milk proteins, casein, and whey. So, why change it?

Every post-exercise drink should strive to fulfill the 3 R’s: Rehydrate, Replenish, and Rebuild!

- Phase III Grade ‘A’ milk is loaded with nutrients that work together to form the perfect post-exercise drink that fulfills the 3 R’s. In fact, Grade “A” milk is superior to commercial drinks that have been “scientifically designed” to fulfill the 3 R’s.

1. Rehydration

Replenishing fluid should be the cornerstone of any program. Studies show that fluid replacement must occur immediately after exercise because hydration is crucial in maintaining physiological function and subsequent exercise performance. It is also essential in regulating body temperature, as elevations in temperature can sharply impair performance and recovery. Studies show that low fat milk is loaded with the right ratio of electrolytes to maximize rehydration post-exercise. A recent study demonstrated that low-fat milk was more effective at rehydrating post-exercise than water, and similar to a popular glucose-based electrolyte sports drink.

2. Replenish Glycogen (Energy) Stores Rapidly

Early studies on replenishment have primarily focused on glycogen stores by consumption of a carbohydrate supplement both during and after exercise. Carbohydrate supplementation stimulates insulin. Insulin has two major roles: 1) facilitates the transport of glucose into the muscle cell, 2) stimulates enzymes responsible for the synthesis of glycogen from glucose.

Recent studies have extended our understanding of how glycogen is replenished. A post-exercise carbohydrate supplement composed of simple sugars found in drinks like chocolate milk is more rapidly transported into the muscle cell during the critical post workout period. Enzymes responsible for manufacturing muscle glycogen are maximally stimulated immediately after exercise. Therefore, it is *essential* that the right kind of carbohydrate be consumed immediately post-exercise.

Even more intriguing are research findings showing that protein (found in milk), when combined with a carbohydrate (like chocolate milk), can strongly stimulate insulin levels in a synergistic fashion. A post-exercise drink must contain carbohydrate and protein because they work synergistically to replenish muscle energy (glycogen). The combination has been shown to be superior to carbohydrate or protein alone at replenishing muscle energy. Phase III Grade “A” low-fat milk delivers the benefits of the right carbohydrates with superior protein, without negatively impacting the critical rehydration process. By further stimulating insulin with protein, muscle glycogen is restored quicker, thereby enhancing recovery.

3. Rebuild

Evidence suggests that insulin stimulates net muscle protein gain by increasing amino acid transport into the muscle and preventing the breakdown of muscle. This interrelationship between glycogen replenishment and insulin is a cornerstone of post-workout supplementation.

A second aspect of this process is the need for a complete protein to further stimulate training adaptations. Protein not only works with carbohydrates to enhance the replenishment of glycogen stores by maximizing insulin, but also provides the essential building blocks for augmenting muscle adaptation (greater strength, power, endurance, and growth) from exercise training. For example, a recent study examined the effects of adding low-fat milk post-workout compared to consuming soy or carbohydrate post-exercise. Compared to soy or carbohydrates, drinking low-fat milk resulted in 70% more fat mass loss, 13% added upper body strength, and 30% greater muscle mass, even though all treatment groups were going through the same exercise program. So, adding Grade “A” low-fat milk to your post-exercise nutrition program will help you recover faster and boost the effects of your training.

Other Benefits of Grade “A” Low-fat Milk:

- Milk provides vital nutrients, like calcium and vitamin D, for healthy bones. Research studies have established that the best absorption of calcium into the body is through milk consumption. In fact, kids and adults that consume milk instead of soda, and/or juices, were associated with lower body fat and lower risk of bone fractures.

Low-Fat Milk Research

- Acute effects of chocolate milk and a commercial recovery beverage on post-exercise recovery indices and endurance cycling performance.
Appl Physiol Nutr Metab 2009;34:1017-1022.
- Improved endurance capacity following chocolate milk consumption compared with 2 commercially available sport drinks.
Appl Physiol Nutr Metab 2009;34:78-82.
- A comparison of the effects of milk and a carbohydrate-electrolyte drink on the restoration of fluid balance and exercise capacity in a hot, humid environment.
Eur J Appl Physiol 2008;104:633-642.
- Acute milk-based protein-CHO supplementation attenuates exercise –induced muscle damage.
Appl Physiol Nutr Metab 2008;33:775-783.
- Milk as an effective post-exercise rehydration drink.
Br J Nutr 2007;98(1):173-80.
- Consumption of fluid skim milk promotes greater muscle protein accretion after resistance exercise than does consumption of an isonitrogenous and isoenergetic soy-protein beverage. Am J Clin Nutr 2007;85:1031-1040.
- Milk ingestion stimulated net muscle protein synthesis following resistance exercise.
Med Sci Sports Exerc 2006;38:667-674.
- Chocolate milk as a post-exercise recovery aid.
Int J Sport Nutr Exerc Metab 2006;16(1):78-91.
- Effects of substituting milk for other sugar-containing beverages on nutrient adequacy, body composition, and bone health in adolescent girls.
Federation of American Societies for Experimental Biology, San Francisco, CA, April 2006.
- 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.
Am J Clin Nutr 2007;86(2):373-81.
- Increasing fluid milk favorably affects bone mineral density responses to resistance training in adolescent boys.
J Am Diet Assoc 2003;103(10):1353-6.
- Children who avoid drinking cow’s milk are at increased risk for prepubertal bone fractures. J. Am Diet Assoc 2004;104:250-253.
- Effect of meals with milk on body iron stores and improvement of dietary habit during weight loss in female rhythmic gymnasts.
J Nutr Sci Vitaminol (Tokyo) 2002;48:395-400.