MILK'S BLEND OF NUTRIENTS: IDEAL FOR SPORT RECOVERY

MILK HAS A UNIQUE COMBINATION OF NUTRIENTS THAT MAKE IT THE IDEAL BEVERAGE FOR POST-EXERCISE REHYDRATION AND PROTEIN SYNTHESIS.

Whether your patients are occasional gym-goers or are training intensely for a triathlon or sport tournament, matching nutrition with exercise is a vital skill to discuss.

Sport nutrition includes ensuring the right amount of carbohydrates are available to replenish glycogen stores; sufficient protein is available to compensate for muscle breakdown; and enough fluids + electrolytes are on-hand to replace what is lost in sweat.[1]

Athletes rely on optimal nutrition to help fuel their performance and are always looking for an edge. Here's a great tip to share with them: Milk is an excellent go-to recovery beverage for athletes because of its unique mix of nutrients, including fluid, protein, carbohydrates and electrolytes.[2] This fact sheet will help you learn more about how milk supports physical activities, so you can share this knowledge with your patients.

MILK AS A SPORT RECOVERY DRINK

Milk naturally contains a mixture of high-quality protein (with all nine essential amino acids), carbohydrates, water and electrolytes. These are all nutrients that are required after sport.[3] Plus, milk is considered isotonic with an osmolality of 280–290 osmol/kg, meaning it contains similar concentrations of carbohydrate and sodium to match the body's needs. All of these factors help milk fuel and rehydrate the body after exercise.[4]

Milk has been extensively studied as a post-sport hydration beverage. Researchers have found that drinking milk after exercise can support both acute recovery and longer-term training adaptation.[5]

Importantly, milk is also known to reduce post-exercise muscle soreness,[6] reduce muscle loss, and reduce symptoms of stress after sport, even more than carb-based sport recovery drinks.[7,8]

WHAT'S THE LINK BETWEEN MILK AND EXERCISE RECOVERY?

Protein: Milk contains nine grams of high-quality protein per cup. Protein is vital after sport, since it helps the body repair the muscles that were used during exercise.[9] Milk contains whey and casein proteins, which enhance post-exercise muscle protein synthesis rates. Milk also has a high concentration of branched-chain amino acids such as leucine, which help support muscle protein synthesis and rehydration.[10,11]

Carbohydrates: Milk contains carbohydrates in the form of lactose, which is a naturally occurring milk sugar that breaks down into glucose and galactose. Lactose can act as a fuel source before and during exercise.[12] Lactose may also play a role in post-exercise recovery by optimizing muscle and liver glycogen, which is the storage form of carbohydrates in the body.[13]

Chocolate milk, which contains added sugars in addition to the naturally occurring lactose sugar, may be more advantageous when additional carbohydrate is needed.[14] That may be the case for soccer or hockey tournaments, marathons, bike races, or other endurance sports with high sweat loss. Studies show that drinking chocolate milk right after exercise and again two hours after exercise helps with exercise recovery and lessens muscle damage.[15]

[1] https://linkinghub.elsevier.com/retrieve/pii/S221226721501802X
[2] https://jissn.biomedcentral.com/articles/10.1186/s12970-019-0288-5
[3] https://www.tandfonline.com/doi/abs/10.1080/17461391.2018.1534989?journalCode=tejs20
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[15] https://karger.com/books/book/2775/chapter-abstract/5802048/Chocolate-Milk-A-Post Exercise-Recovery-Beverage?redirectedFrom=fulltext
[16] https://www.mdpi.com/2072-6643/10/2/228/htm

WHAT'S THE LINK BETWEEN MILK AND EXERCISE RECOVERY?

Fluid and electrolytes: During exercise, it's common for fluid and electrolytes to be lost through sweat, and these nutrients need to be replenished during and after activity. Milk is an excellent choice since it contains fluid and electrolytes, including sodium and potassium. These nutrients facilitate fluid recovery, rehydration, and electrolyte replenishment following exercise.[16]

Electrolytes also help improve the recovery of skeletal muscle.[17] One study showed that gradually drinking milk restored fluid balance better than water or carbohydrate electrolyte drinks, due to how these beverages are digested. Milk is released more slowly from the stomach compared to water or sports drinks, and dairy proteins contribute to this beneficial effect.[18]

The average athlete loses 1-3L sweat/hour, and both the fluid and the electrolytes need to be replenished. The main electrolyte minerals that are lost through sweat are sodium and chloride, but small amounts of potassium, magnesium, and calcium are also lost.[19, 20]

Here's an overview of the nutrients found in sweat, and the nutrients found in milk:

Mineral	mg/L	Nutrients in 1 cup 1% milk[21]
Sodium	460-1840	113 mg
Chloride	710-2840	N/A
Potassium	160-390	387 mg
Magnesium	0-36	28 mg
Calcium	0-120	322 mg

Chart from: www.sportsrd.org/wp-content/uploads/2018/11/Whats-In-Your-Sweat.pdf

The American Journal of Clinical Nutrition published a study to establish a beverage hydration index on drinks that provide optimal hydration status.[22] Researchers looked at 13 different beverages including water, coffee, tea, soda and milk to assess urine output and fluid balance. They found that beverages with a small amount of fat, protein or sugar were better able to keep people hydrated for longer. Since milk contains fat, protein and sugar, it came out on top as being even more hydrating than water. That's because the macronutrients in milk help delay gastric emptying and keep hydration happening over a longer period.

MILK VS. SPORKS DRINKS

Compared to traditional sports drinks, milk has similar amounts of carbohydrate and sodium, but more potassium and protein. The other advantage? Milk is a whole food, while sports drinks are considered ultra-processed and contain artificial colours and flavours.

Nutrient (per cup)	Average commercial sports drink*	Milk
Carbohydrate	15 g	12 g
Sodium	135 g	110 mg
Potassium	40 mg	387 mg
Protein	0 g	9 g

*Based on an average of Gatorade Cool Blue and Powerade Mixed Berry

PRACTICAL ADVICE FOR PATIENTS

During activity, ingesting carbohydrates increases muscle glycogen stores, prevent muscle damage and help with training adaptations.[23] Milk can be sipped during exercise, similar to sports drinks.

After resistance training or intense exercise, recommend 20 grams of high-quality protein to provide anabolic stimulus for muscle protein synthesis.[24, 25]

- A cup of milk contains 9 g protein.
- Athletes need about 2 cups of milk for post-workout muscle recovery.
- Enjoy milk as-is or add it to a smoothie.

The other benefit to milk is that it's readily available, making it a convenient and easy option to facilitate post-exercise recovery.[26, 27, 28] Whether it's a weekday hockey game, a weekend run or a week-long volleyball tournament, milk is an excellent beverage to promote glycogen storage, muscle synthesis and rehydration.

For more information, visit milk.org.

[17] https://jissn.biomedcentral.com/articles/10.1186/s12970-019-0288-5
[18] https://www.cambridge.org/core/journals/british-journal-of-nutrition/article/a-metered-intake-of-milk-following-exercise-and-thermal-dehydration-restores-whole-body-net-fluid-balance-better-than-a-carbohydrateelectrolyte-solution-or-water-in-healthy-young-men/1124729E49B3AC434876B15A9DF7F770
[19] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6373370/
[20] https://www.acefitness.org/certifiednewsarticle/715/electrolytes-understanding-replacement-options/#:~:text=Electrolytes%20lost%20in%20high%20concentrations,include%20potassium%2C%20magnesium%20and%20calcium.
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