Keenan Robinson

Athletic Trainer and Strength/Conditioning Coordinator

- Robinson is the Director of High Performance at Arizona State University.
- Joined the U.S. Swimming National Team staff as an athletic trainer and strength/conditioning coordinator for gold medalists Michael Phelps and Allison Schmitt.
- Served as a trainer at international swim meets, such as the 2009, 2011 World Championships and the 2010, 2013 Pan Pacific Games.

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post-exercise nutrition

Can **affect performance** at the next event

Helps **reduce the chances of injury**

Boosts the **health, well-being** of athletes

IT'S JUST AS IMPORTANT AS PRE-EVENT NUTRITION!

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who benefits from recovery?

Soccer players during tournaments

Football players doing 2-a-days

Swimmers during a meet

ANY ATHLETE PARTICIPATING IN REGULAR STRENUOUS EXERCISE

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what is recovery?

Muscle/ glycogen replenishment and rebuilding

Electrolyte replenishment and rehydration

Mental rest and recovery

Recovery can help athletes **avoid injuries**, and **feel their best** so they can stick to their training routines

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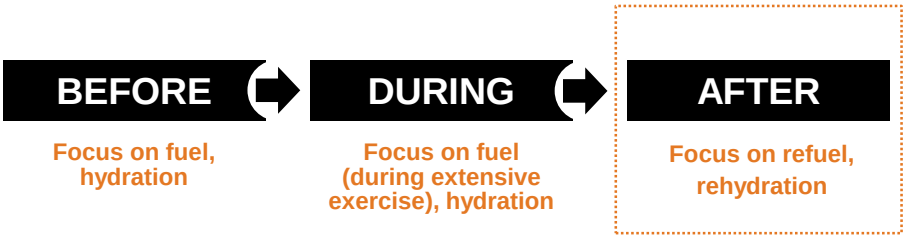
the recovery context



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WHAT TO EAT

Carbs
Protein
Fluids and electrolytes

WHEN TO EAT

30 minutes to 2 hours after strenuous exercise

HOW MUCH TO EAT

0.75 g carbs/lb body weight

16-24 fl. oz./lb body weight lost during exercise

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WHAT TO EAT

Carbs

Protein

Fluids and electrolytes

CARBOHYDRATES
to refuel depleted muscle glycogen


PROTEIN
to reduce muscle breakdown and stimulate growth



FLUID and ELECTROLYTES
to rehydrate the body by replenishing sweat losses


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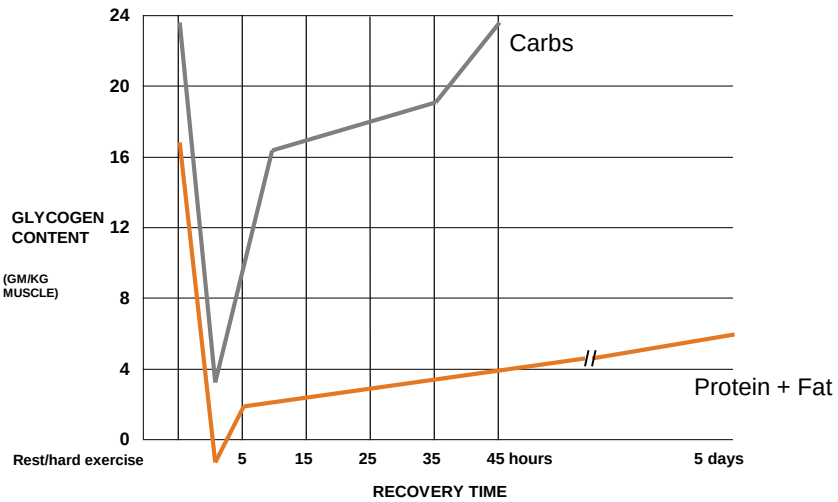
carbs refuel while protein builds and repairs



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the power of protein

About one gram protein for every three or four grams carbs

Consider:
- Type of protein, quality
- Leucine content
- The combination with carbs

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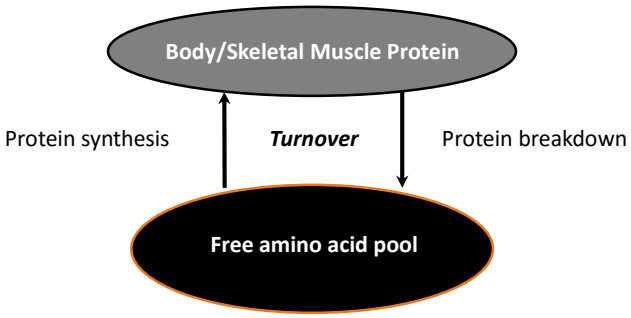
protein turnover



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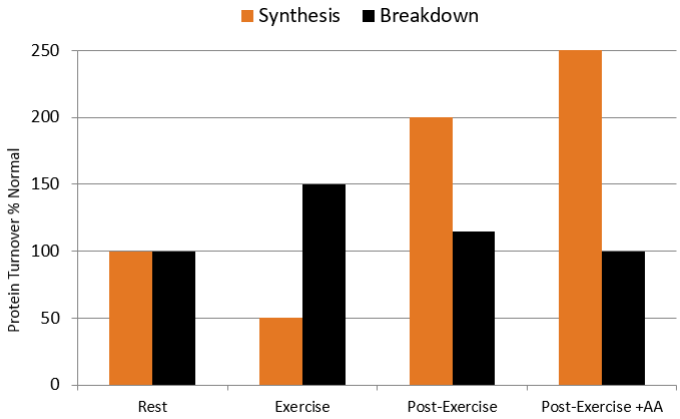
protein synthesis and protein breakdown at rest, during exercise, and post-exercise



Biolo et al., *Am J Physiol*, 1995; *Am J Physiol*, 1997

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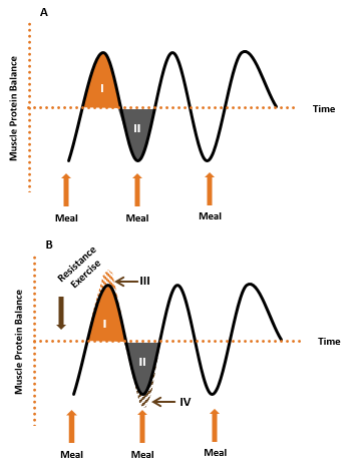
net protein balance response to nutrition and exercise

- Exercise is essentially ***catabolic***; energy is required for work
- Recovery is essentially ***anabolic***; energy and rest is required to rehydrate, refuel, repair, and rebuild
- *Nutrients – primarily carbohydrate and protein – need to be consumed to achieve an anabolic state, a positive NET balance*



Phillips et al., *J Am Coll Nutr*, 2005

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for example, after exercise 120 pound athlete may need…

Carbohydrate	**82 grams** (amount in about 24 ounces of chocolate milk)
Protein	**20 to 27 grams** (approximately equal to the amount in 24 ounces of chocolate milk)
Fluids	**24 ounces** (depending on exercise intensity, weight loss)
Electrolytes	**Sodium, calcium, potassium and magnesium** (depending on sweat losses)

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and, a 190 pound athlete may need…

Carbohydrate	**130 grams** (amount in about 40 ounces of chocolate milk)
Protein	**32 to 43 grams** (amount in a quart of milk)
Fluids	**24 ounces** (depending on exercise intensity, weight loss)
Electrolytes	**Sodium, calcium, potassium and magnesium** (depending on sweat losses)

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considerations for recovery

Food vs. beverage	Carb and protein combo	Convenience and affordability	Taste and tolerance	Intensity of workout, recovery timing

Find the right options and combinations for each athlete

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post-workout snack ideas

- Turkey and Cheese with Apple Slices and Pretzels
- Tuna on Whole Wheat
- Banana and Peanut Butter
- Chocolate Milk




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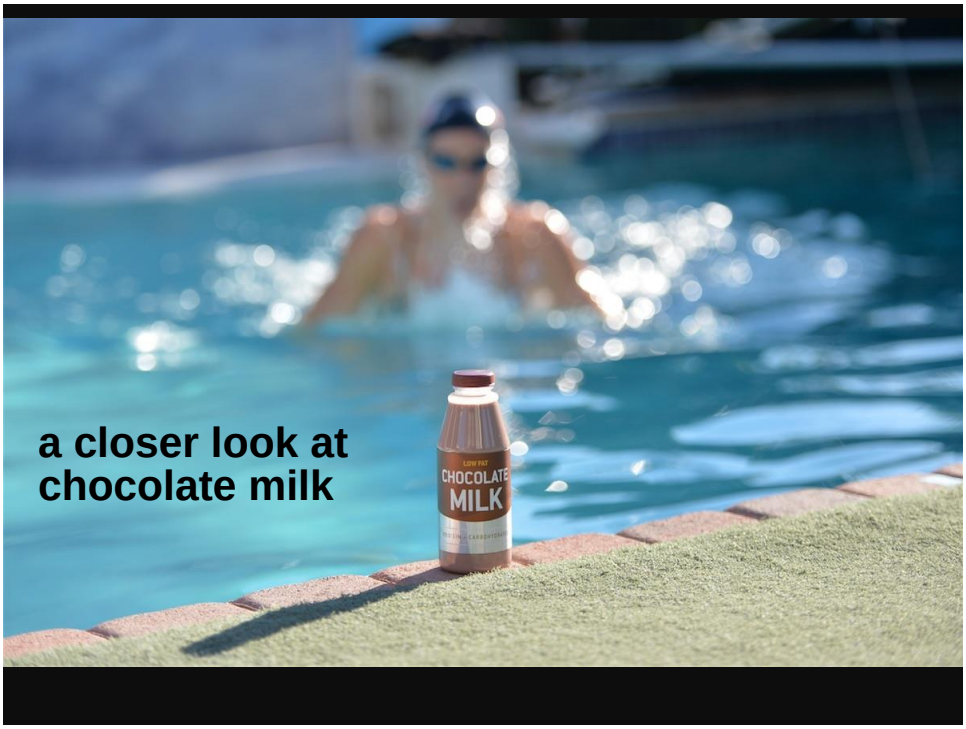
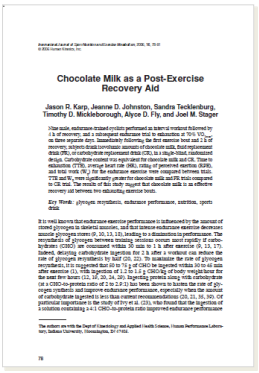


why chocolate milk?

Backed by Science

Trusted by Athletes

a growing body of evidence



Chocolate Milk as a Post-Exercise Recovery Aid

Jason R. Karp, Jeanne D. Johnston, Sandra Tecklenburg, Timothy D. Mickleborough, Alyce D. Fly, and Joel M. Stager

2006

More than 20 studies on the specific benefits of milk and chocolate milk for post-exercise recovery

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lowfat chocolate milk: what's in it?

Nutrition Facts

Serving Size 8 fl oz
Servings Per Container 1

Amount Per Serving	
Calories 160	Calories from Fat 25
	% Daily Value*
Total Fat 2.5g	4%
Saturated Fat 1.5g	8%
Cholesterol 10mg	3%
Sodium 150mg	6%
Total Carbohydrate 26g	8%
Dietary Fiber 1g	4%
Sugars 25g	
Protein 8g	

Vitamin A 10%	•	Vitamin C 4%	
Calcium 30%	•	Iron 4%	
Potassium 12%	•	Vitamin D 25%	
Riboflavin 25%	•	Niacin 12%	
Vitamin B12 15%	•	Phosphorus 25%	
Magnesium 8%	•		

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories	2,000	2,500
Total Fat	Less Than	65g	80g
Saturated Fat	Less Than	20g	25g
Cholesterol	Less Than	300mg	300 mg
Sodium	Less Than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

CARBS

PROTEIN

9 ESSENTIAL NUTRIENTS
including many not found in sports drinks

CALCIUM and VITAMIN D
B VITAMINS
ELECTROLYTES
sodium, potassium, calcium, magnesium

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the research

1. Refuel and Rehydrate
2. Perform
3. Rebuild
4. Reshape

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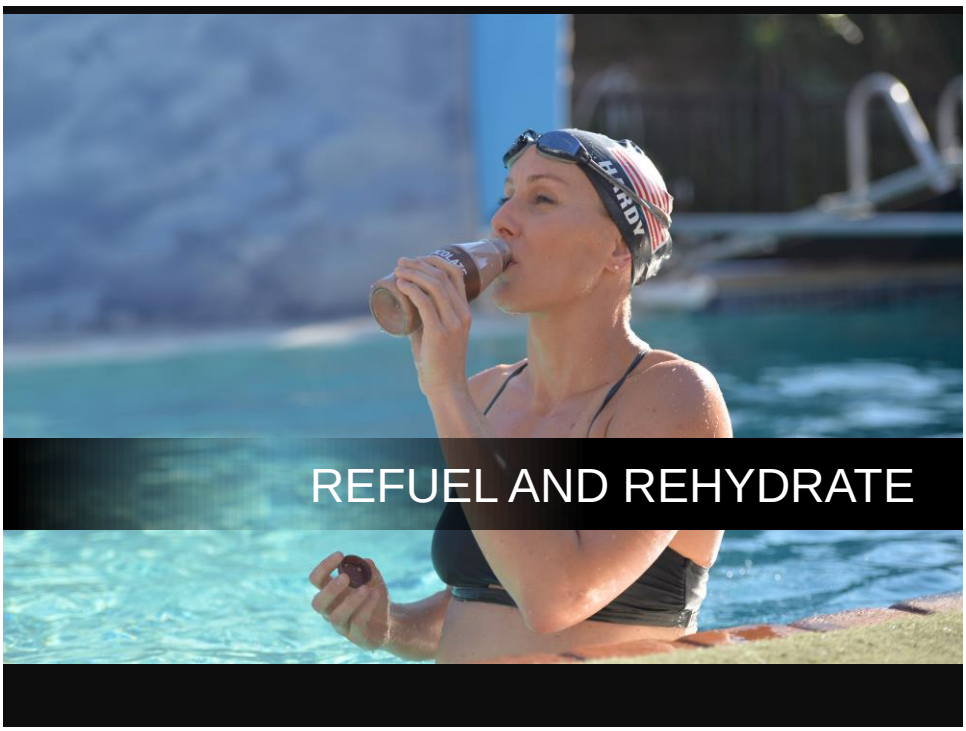

Replacing muscle glycogen

Lowfat chocolate milk contains the right three to one mix of carbs and protein scientifically shown to help refuel muscles. It helps restore muscles quickly to their peak potential and helps replenish what your body has lost – including fluids and critical nutrients lost in sweat.

- Male runners who drank 16 ounces of chocolate milk after exercise led to **greater concentration of glycogen in muscles** at 30 and 60 minutes post-exercise, compared to a carb only sports drink
- Athletes who drank milk after exercise stayed **hydrated longer** than when they drank a sports drink

The Right Mix of Carbohydrates and Protein

3:1

Karfonta KE, et al. *Medicine & Science in Sports & Exercise*. 2010;42:S64
Watson P, et al. *European Journal of Applied Physiology*. 2008;104:633-642.
Shirreffs SM, et al. *British Journal of Nutrition*. 2007;98:173-180.

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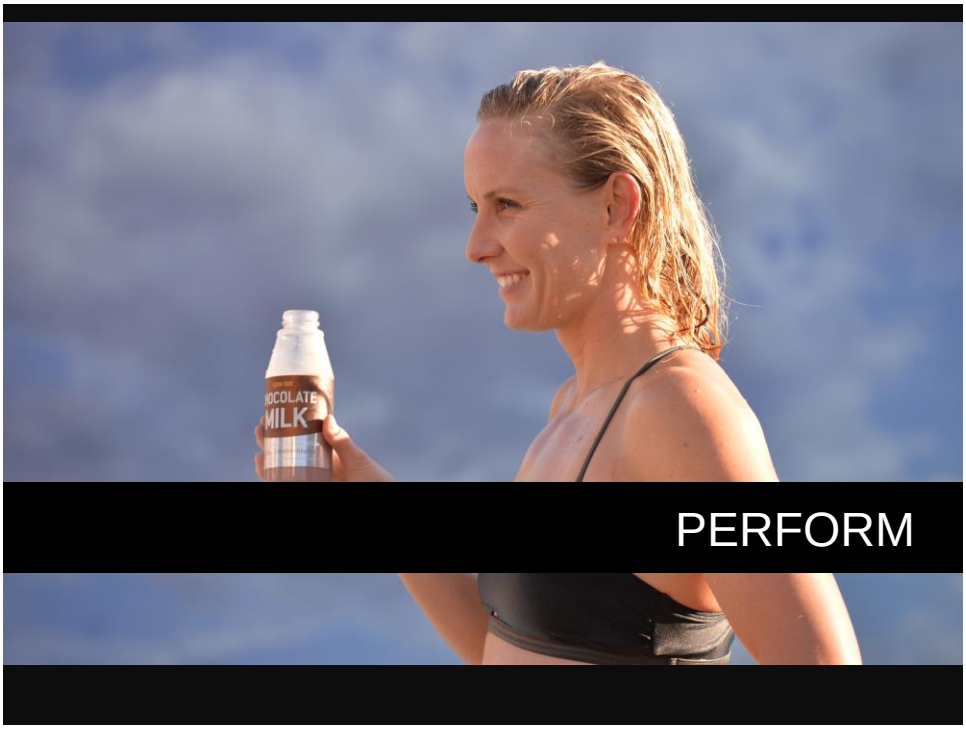
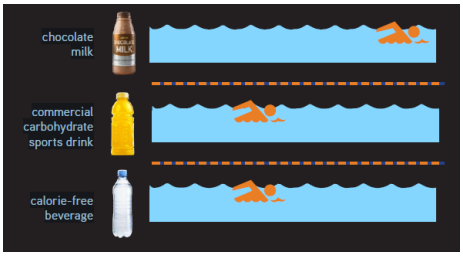


power and speed during the next workout

According to new research, grabbing reduced fat chocolate milk after a hard swim could give swimmers a performance edge, compared to when they recovered with a carbohydrate sports drink or calorie-free beverage

On average, swimmers who recovered with **chocolate milk** after an intense practice, on average shaved off **2.1 seconds** per 200 yard swim, and **0.5 seconds** per 75 yard sprint in time trials later that same day, compared to when they recovered with a traditional carbohydrate sports drink or calorie-free beverage.



Stager JM, Brammer CL, Sossong T, Kojima K, Spanbaur D, Grand K, Wright BV. Supplemental recovery nutrition affects swim performance following glycogen depleting exercise.

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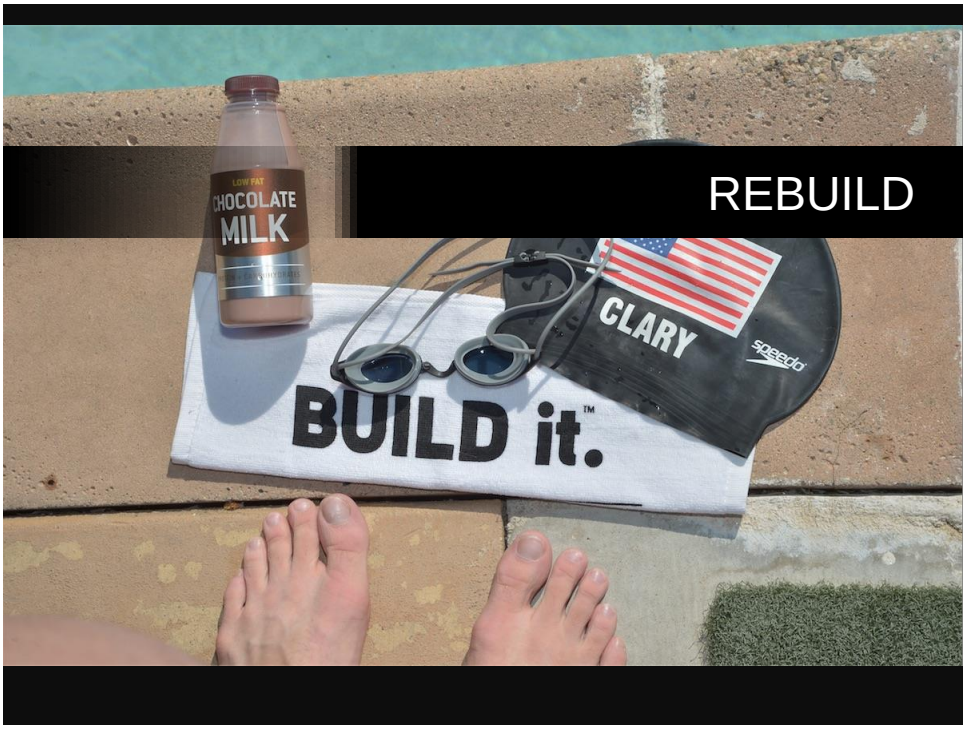

A Muscle Building Advantage

Lowfat chocolate milk contains high-quality protein to help repair and rebuild muscles after strenuous exercise.

- Male runners those who drank fat free chocolate milk after exercise **had enhanced skeletal muscle protein synthesis** – a sign that muscles were able to repair and rebuild – compared to a fluid replacement drink with *just* carbohydrates
- Athletic men and women who drank milk one hour after a "leg resistance exercise routine" **experienced a significant increase in two measured amino acids**
- Athletes who recovered immediately with plain or chocolate milk **had less exercise-induced muscle damage** than those who drank water or sports drinks

Lunn W, et al. *Medicine and Science in Sports and Exercise*, 2010;42:S48.
Elliot TA, et al. *Medicine and Science in Sports and Exercise.* 2006;38:667-674.
Cockburn E, et al. *Applied Physiology, Nutrition and Metabolism.* 2008;33:775-783.
Cockburn E et al. *Applied Physiology, Nutrition and Metabolism.* 2010;35:270-277

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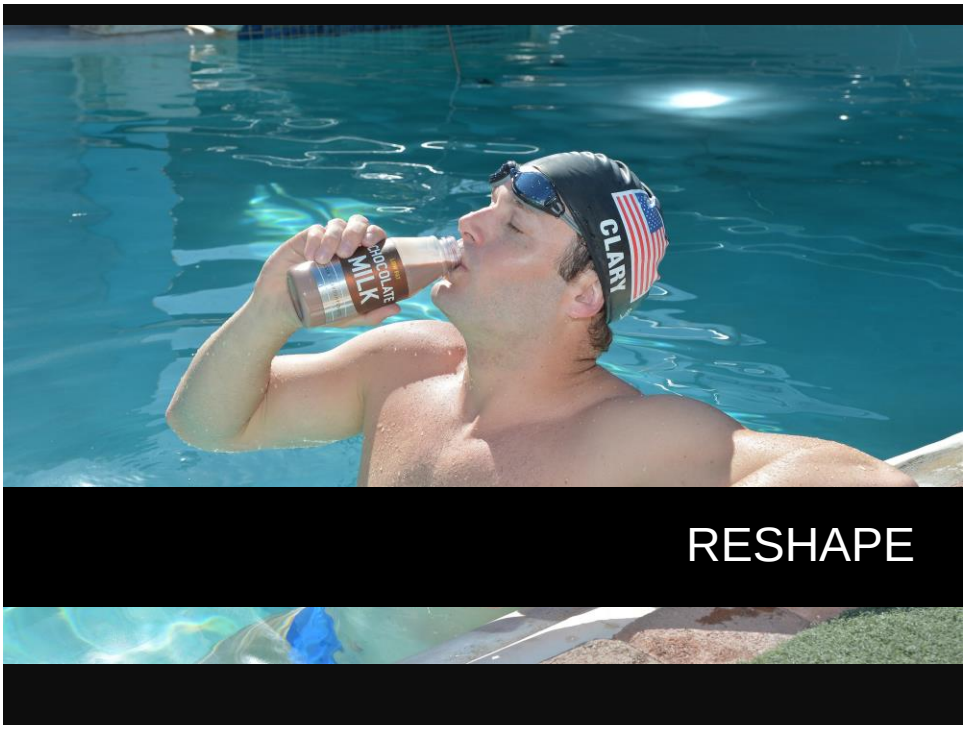

Improved Body Composition

Drinking chocolate milk post-workout could help athletes tone up and reshape their bodies, according to research.

- 32 healthy but untrained cyclists who recovered with chocolate milk **gained more muscle** and **lost more fat** during training, with a 3 pound lean muscle advantage, compared to athletes who recovered with a carbohydrate drink
- A 12-week training program found that milk drinkers **gained more muscle** and **lost more fat** than those who refueled with a soy or carb-only beverage

McCleave EL et al. *ACSM*, 2011.
Hartman JW, et al. *American Journal of Clinical Nutrition,* 2007;86:373-381.
Josse et al. *Medicine & Science in Sports & Exercise.* 2010;42:1122-1130.

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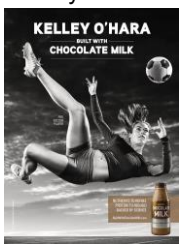
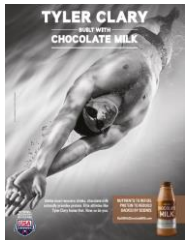
BUILT WITH CHOCOLATE MILK athletes

Kelley O'Hara



Kevin Love

Tyler Clary



Jessica Hardy

Mirinda Carfrae

Craig Alexander

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how you can get in the game

1. **To learn more about the science behind the recovery benefits of lowfat chocolate milk and access exclusive training tips and videos, head to**
   BUILTWITHCHOCOLATEMILK.COM/COACHESCORNER

2. **Follow BUILT WITH CHOCOLATE MILK**
   - Facebook.com/BuiltWithChocolateMilk
   - Twitter.com/Chocolate_Milk and join the conversation by using the hashtag #BuildIt
   - Instagram @BuiltWithChocolateMilk
   - YouTube.com/BuiltWithChocolateMilk

3. **Talk to your local dairy** about where your favorite chocolate milk is sold.

4. **Send a letter to parents to ask them to buy chocolate milk for their children's recovery efforts**

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