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DURING-WORKOUT AND COMPETITION FUELING

During exercise fluid and carbohydrate needs are based on the intensity and duration of the training session. While athletes might power through shorter, less intense workouts on water, longer workouts often require carbohydrates and electrolytes.

What happens to the body during exercise?

1. Energy from carbohydrate is being burned as fuel

- Catabolic (breakdown) hormones are released during exercise to trigger the breakdown of stored carbohydrate and fatty acids as a source of fuel.
- When glycogen (stored carbohydrate) levels decrease, amino acids become a greater source of fuel used for exercise.
- To reduce the amount of amino acids being burned as energy during long workouts (>90 min), an athlete should consume carbohydrates during exercise.

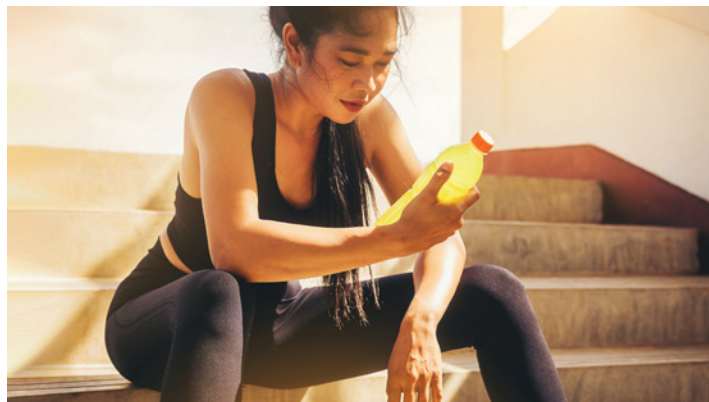
2. The body is sweating, losing fluid and electrolytes

- As the body becomes more dehydrated, it burns through glycogen (stored carbohydrate) more quickly, further decreasing energy stores.
- Sodium, potassium, and trace minerals are lost in sweat, which can contribute to muscle cramping.
- Sweating leads to thicker blood plasma, making the heart work harder to pump blood to working muscles, ultimately leading to the onset of fatigue.

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**During exercise, the main focus is to stay hydrated
with water and/or sports drinks**

- The general fluid recommendation is to consume 5-10 ounces of fluid every 15-20 minutes of consistent exercise.
- The general electrolyte recommendation is to consume 1 gm sodium/1 L fluid or 1000 mg sodium/32 oz fluid.
- For those exercising 0-90 minutes, water is an appropriate way to hydrate.
- To individualize hydration recommendations, calculate sweat rate (see Calculating Sweat Rates chart).



CALULATING SWEAT RATES

Calculations	Examples
Pre-exercise weight – Post-exercise weight = Pounds lost	Pre-exercise weight = 155 lbs Post-exercise weight = 152 lbs 155 lbs - 152 lbs = 3 lbs lost
Multiply pounds lost by 16 to get into ounces	3 lbs x 16 oz = 48 oz
Add fluid consumed during exercise	Ounces drank during exercise = 32 oz
Result = How many total ounces of fluid were lost during exercise	32 oz drank + 48 oz lost = 80 total oz of fluid lost during exercise
Take total number of exercise minutes and divide into 15-20 minute segments	Athlete exercising for 2 hours = Six 20-minute hydration intervals
Divide total ounces needed by 15-20 minute segments to calculate how many ounces should be consumed at each hydration interval	80 oz / drinking 6 times in 2-hour workout = ~13 oz every 20 minutes

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CARBOHYDRATE NEEDS DURING EXERCISE

Exercise Duration	Total Carbohydrate
< 30 minutes	None required, water should be sufficient
30-60 minutes	Mouth rinse of carbohydrates or small amount of carbohydrate
60 minutes - 2.5 hours	30-60 gm carbohydrate/hour
> 2.5 hours	Up to 90 gm carbohydrate/hour (Ideally 1 gm/kg body weight/hour)

If you train longer than 90 minutes, the sports nutrition recommendation is to add carbohydrates to provide fuel for working muscles.

If you know your workout will be multiple hours long, start fueling with carbohydrates earlier in the training session to help prevent the early onset of fatigue.

If you have never consumed carbohydrates during exercise, practice by eating/drinking approximately 20-30 grams of carbohydrate every 30 minutes.

20-30 grams of carbohydrate ideas:

- 1 carbohydrate gel or GU
- 4-6 energy bites/blocks
- 1 small banana
- Half of a carbohydrate-centric energy bar
- 12-16 ounces sports drink

If you are playing back-to-back games, in a tournament, or needing to fuel between workouts, the best solution is a nutrient dense snack that provides adequate nutrition for less volume with water and/or a sports drink for hydration.

