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The Hydration Process in Athletes and its Analysis

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Annotation: We all know that water is important, but have you ever wondered why? Drinking enough water throughout the day helps regulate body temperature, moisturizes the eyes, nose and mouth, helps protect organs, delivers nutrients and oxygen to cells, and has many other functions. Without water and proper hydration, many of these functions cannot be performed.

In this article, we'll look at the importance of proper hydration for athletic performance, how to determine how much you need, signs that you may not be getting enough fluids, and practical tips for optimizing your hydration levels.

Keywords: hydration, dehydration, human, body, health, liquid, water.

Hydration is the body's ability to manage water resources. A person needs a constant supply of fluids so that the body can transport nutrients, remove waste, and maintain chemical processes.

Drinking water and hydration are important for everyone, but athletes need to take it more seriously as they lose more water and therefore have higher than average daily fluid requirements. We lose at least 2.5 liters of water per day only through breathing, sweat and excretions, and another 2-6% of the total mass during exercise. So, during one intense workout lasting 60-90 minutes, athletes lose about 4% of fluid. Given the critical level of 7%, it is not difficult to understand the importance of maintaining a normal drinking regime to avoid dehydration.

The daily water requirement of athletes depends on temperature and humidity, activity level and clothing covering our body. Without enough water in your body, you risk stagnant muscle growth, fat loss, and poor overall health.

Dehydration or “draining” is one of the most popular practices that athletes and bodybuilders resort to to shed those last few pounds or achieve a more ripped physique. Many of them specifically limit their water consumption for this purpose, doing cardio for hours or steaming in a sauna. While this may lower the number on the scale, dehydration can also have a significant impact on performance. If an athlete wants their muscles to work properly, they simply need to maintain their hydration.

Water, like oxygen, is essential for life. You can live without water for only 3-5 days! In addition to helping maintain life, water for athletes performs a number of other important functions in the body, including:

replenishes water lost during sweating;

improves blood flow and circulation in your body;

ensures prompt delivery of oxygen and nutrients to the muscles;

cools the body through sweating;

Removes accumulated waste and metabolic by-products from muscles.

In addition to the fact that water improves health and performance, its benefits for the athlete visually affect the figure - when the muscles are sufficiently hydrated, they seem more tense and prominent!

When determining how much water an athlete needs to drink per day, start from the fact that three liters is the absolute minimum on days without training. Intense exercise continually increases metabolic activity, even at rest. The actual need for fluid can only be determined individually. A good recommendation would be to calculate based on the formula: 50 ml per kilogram of body weight during the day. In the warm season, when the average daily temperature is above +25-28°C, you should drink one or two liters more, since a lot of water is lost through sweat.

When it comes to specific water recommendations for an athlete, it is necessary to discuss this issue individually, taking into account factors such as:

body type;

floor;

weight, height, age;

the type of sport you play;

weather;

time of day when you train;

What other drinks, besides water, do you drink during the day?

Before, during and after training, the need for water increases even more. Therefore, drink at least one liter 90 minutes before training to keep your muscles hydrated. Water is also important for your joints, as a dehydrated body cannot provide enough synovial fluid. This fluid is necessary to avoid strong friction of the articular cartilage, which otherwise can lead to damage to the musculoskeletal system.

During your workout, regularly drink a couple of sips of water every 15-20 minutes. This will ensure the best state of hydration.

After training, you also need to drink at least 0.5 liters of water to support regeneration processes. In this case, water helps remove waste products from the muscles, such as lactic acid, which is produced during exercise, and feeds the muscle cells with nutrients such as proteins and carbohydrates.

Most people rely on their thirst as an indicator of when and how much fluid they need. The problem is that, unlike other warning signs such as fatigue or hunger, thirst has a delayed onset. At the time you feel thirsty, your body is already slightly dehydrated. Thus, thirst is not always a reliable signal of lack of fluid. So make regular water consumption your top priority and develop new habits that will help you reach your goal of consuming at least three liters a day.

There are a few simple tricks to help you integrate drinking water into your daily life. For example, determine the time at which you will drink a certain amount of water: immediately after waking up to speed up your metabolism, before or after breakfast, lunch and dinner, before and after exercise.

Another way is to drink a glass of water every hour, setting notifications on your smartphone or running a specialized application, or drawing marks on the bottle showing a certain time. You can also leave large glasses and water bottles in places where you spend a lot of time, such as your work place, in your car, or next to your bed.

Everyone's body is different, and some sweat more than others. Recommended fluid intake

depends on how much you sweat. Many factors influence how much they sweat or their sweat rates. The rate of sweat loss is directly related to the intensity of exercise: the more intense athletes exercise, the more they sweat.

Using this equation you can calculate your personal sweat rate: 6

[weight loss (kilograms) + fluid intake (liters)]/workout time (hours) = sweat rate (liters/hour)/ Once you know your sweat rate, you will know how much fluid you should drink per hour to replenish fluid lost through sweat.

Playing intermittent and endurance sports for long periods of time can cause you to sweat profusely. Body weight, hot or humid environment, type of sport, and clothing or equipment can also affect how quickly you sweat.

Athletes and those involved in sports do not and should not wait for thirst to drink fluids: during training, the thirst response may be delayed, and dependence on thirst can lead to hypohydration.

Sweat isn't just made up of water—it also contains electrolytes. Because you lose electrolytes when you sweat, you may need to replenish them during intense exercise. Electrolytes are needed to balance water and pH, move nutrients into cells, remove waste from cells, and ensure proper functioning of nerves, muscles, heart, and brain.

Those who sweat a lot or exercise for more than two hours need to replenish important electrolytes such as sodium and potassium, which are lost in high concentrations through sweat.

Proper replacement of electrolytes during exercise also helps prevent muscle cramps. When an athlete loses sodium through sweat, they are at higher risk for muscle cramps.

When people engage in intense exercise for more than an hour, their glycogen stores become depleted. Then you can replenish your glycogen stores by eating or drinking easily digestible carbohydrates. When glycogen stores are replenished with sufficient carbohydrates, usually in the form of glucose, a person's brain and muscles can continue to function effectively, allowing them to complete their workout.

After about an hour of moderate to intense training, aim to consume 30 to 60 grams of carbohydrates every hour throughout your workout through food or drink. Most sports drinks contain 6 to 8 grams of carbohydrates per liter, making them an excellent option for replenishing glycogen stores and replenishing fluids.

The combination of electrolytes and carbohydrates in a sports drink can help maintain blood glucose levels, carbohydrate oxidation, and electrolyte balance. Carbohydrates add sweetness to sports drinks, which may encourage an athlete to maintain hydration levels by drinking more.

You need to know that plain water is fine for most workouts lasting less than two hours.

To avoid hypohydration and its adverse side effects, it is important to know and be aware of the signs and symptoms of hydration for yourself and those around you. Early signs and symptoms of hypohydration may include:

thirst

general discomfort

fatigue

headache

nausea

vomit

If ignored, these symptoms can worsen and lead to increased thirst, gastrointestinal cramps, diarrhea, hot flashes, and chills. Even moderate levels of dehydration can increase physiological stress, such as increased heart rate and decreased cardiac output, making it more difficult for the body to dissipate heat. Maintaining hydration levels between -1% and +1% of body weight helps the body better regulate temperature, preventing heat-related illness and promoting optimal athletic performance.

When we talk about liquid, we don't just mean simple still water, although it will be a priority in any case, since it is the only drink that does not contain calories. But in addition, it is permissible to consume unsweetened tea, natural juices, milk or BCAA ((from the English "branched chain amino acids") - a complex of three essential amino acids with a branched posterior chain) and other additives that can be dissolved in water. Mineral water will also be useful for athletes, but in limited quantities. Alcoholic drinks, sweet soda, and packaged juices are completely excluded.

As a result, we want to advise all athletes on the proper use of water:

avoid drinking large amounts of water at one time. This slows down digestion and absorption of fluid, causing the intestines to become full of fluid. Additionally, drinking too much water can cause the concentration of electrolytes (sodium and potassium) in your blood to drop to dangerous levels;

water is ideal for workouts that last less than an hour and are done in a relatively cool environment. But for longer sessions or workouts in hot, humid climates, a drink with added electrolytes is recommended. Electrolytes, including sodium and potassium, can be lost through sweat during exercise, leading to an increased risk of muscle cramps, fatigue, nausea and confusion;

when determining how much water you consume per day, don't forget to take into account the foods you eat. So, soups, fruits and vegetables contain a large amount of water and can cover up to 15-20% of the daily requirement;

it is also important to ensure that you have enough sodium in your diet. Eat olives, pickles, carrots and dairy products. This will help the body process water better and maintain hydration during exercise.

Maintaining water balance should not cause serious difficulties. Follow the simple guidelines outlined above to achieve optimal performance in the gym.

List of used literature

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