



DETERMINING FITNESS INDICATORS IN ATHLETES

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ABSTRACT

This study focuses on determining fitness indicators in athletes by analyzing their sweat rate and hydration needs during training. Understanding the rate of sweating, which varies under different environmental conditions, is crucial for optimizing both the physical performance and health of athletes. The research was conducted by measuring athletes' body weight before and after training sessions, as well as tracking fluid intake during exercise. The results demonstrate how variations in sweat rates correspond to changes in training intensity and environmental factors. Findings show a direct correlation between fluid loss and reduced athletic performance, emphasizing the importance of personalized hydration plans for maintaining optimal fitness levels.

KEYWORDS: Athletes, fitness indicators, sweat rate, hydration, fluid loss, training intensity, environmental factors, athletic performance, personalized hydration plans.

INTRODUCTION

One of the easiest ways to ensure that a young athlete consumes enough water to maintain fluid balance during training is to calculate their sweat rate. Determining the sweat rate—how quickly an athlete's body loses fluid through sweat—is crucial for both conditioning and adaptation. "People's hydration needs are truly individual. If an athlete becomes dehydrated by two percent, this can reduce their performance by approximately 20 percent," explains TrueSport expert Kristen Ziesmer (<https://truesport.org/hydration/calculate-athletes-sweat-rate/>). Calculating the sweat rate is one of the best methods for creating a hydration plan. It shows how much fluid the athlete is consuming and how much they should be drinking, and it's one of the most affordable and simplest tests.

METHODS

The amount of fluid an athlete loses per hour varies under different conditions. Therefore, sweat rate was measured 54 times over 18 days to determine how much fluid an athlete should consume in various temperatures and weather conditions. Before calculating sweat rate, the athlete's weight was measured on a scale before and after each training session, and the amount of fluid consumed during the workout was recorded. It was ensured that athletes emptied their bladder before being weighed. To calculate sweat rate, the athlete's pre- and post-workout weight was measured in kilograms, the weight lost (in kilograms) was multiplied by 16 milliliters, and the amount of fluid consumed during exercise was recorded in milliliters. The

duration of the workout was noted, and sweat rate per hour was calculated by dividing the total amount of fluid lost by the duration of the workout.

RESULTS AND DISCUSSION

For weightlifters, the pre-training weight was 87 ± 0.3 kg, and the post-training weight was 85 ± 0.3 kg, showing a difference of 2.2 ± 0.3 kg. When the weight lost was multiplied by 16 milliliters, the average fluid loss amounted to 35.2 ml. The amount of fluid consumed during the workout was 18 ml. The total amount of fluids used during the activity ($35.2 + 18$) averaged 51.2 ml. The athletes underwent 1.5 hours of intensive training. When sweat rate was calculated ($51.2/1.5$), the sweat rate per hour was found to be 34.1 ± 1 ml. After aerobic exercises and breath modulation training, the sweat rate in weightlifters decreased from 34.1 ± 1 ml to 32.2 ± 1 ml, and in canoe rowers, it decreased from 36.3 ± 1 ml to 34.9 ± 1 ml. This indicates an improvement in conditioning levels.

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