

ATHLETE HYDRATION: THE INVISIBLE PERFORMANCE ENHANCER

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Abstract: *Hydration status is a fundamental physiological determinant of athletic performance and athlete health, yet it remains frequently underestimated in both scientific research and applied sports practice. Even mild dehydration, defined as a body mass loss of approximately 1–2%, has been consistently associated with impairments in endurance performance, muscular strength and power, cognitive function, and thermoregulatory efficiency, while severe dehydration exceeding 10% of body mass may lead to life-threatening outcomes. Despite substantial scientific evidence, hydration is often overshadowed by more visible performance-related factors such as nutrition, supplementation, training load, and recovery strategies. In addition, hydration practices in sport are frequently influenced by misconceptions, including exclusive reliance on thirst as a regulatory signal, inappropriate fluid overconsumption, and misunderstandings regarding the role and composition of sports drinks. In accordance with current recommendations of the American College of Sports Medicine (ACSM) and the International Olympic Committee (IOC), hydration as an essential, evidence-based component of performance optimization in athletes. Key physiological roles of body water are maintenance of cardiovascular stability, support of metabolic and cellular processes, regulation of body temperature, and preservation of neuromuscular function during physical exertion. As highlighted in ACSM and IOC consensus statements, the physiological response to dehydration is determined by the interaction between hydration status, sweat rate, electrolyte balance, and environmental stressors such as heat, humidity, cold exposure, and altitude. Pronounced interindividual variability in sweat rate and sweat electrolyte composition further underscores the limitations of generalized hydration prescriptions and the necessity for individualized hydration strategies. Nevertheless, general evidence-based recommendations for pre-exercise, intra-exercise, and post-exercise hydration can be applied with consideration of sport-specific demands, exercise intensity, environmental conditions, and athlete characteristics. Hydration should therefore be recognized as an “invisible” but powerful performance enhancer, contributing to improved athletic performance, reduced risk of heat-related illness, optimized recovery, and long-term athlete health.*

Key words: *athletes, sport performances, dehydration, rehydration*