

Montclair State University
Counseling and Psychological Services (CAPS)
**How Alcohol Affects Nutrition and
Endurance**

Being physically fit and well-conditioned is the hallmark of a champion. However, no matter how many wind sprints and laps you do, drinking alcohol constricts your aerobic metabolism and endurance. This occurs when alcohol is oxidized by the enzyme alcohol dehydrogenase, which leads to the accumulation of nicotinamide-adenine dinucleotide (NADH) and slowing of the citric acid cycle.

Unfortunately, alcohol holds very little nutritional value to the athlete. The relatively high calories in alcohol are not available to your muscles. Alcohol calories are not converted to glycogen, a form of stored carbohydrates, and thus not a good source of energy during exercise. Once metabolized, any calories from alcohol are released as heat.

Not only is alcohol devoid of proteins, minerals, and vitamins, it actually inhibits the absorption and usage of vital nutrients such as thiamin (vitamin B₁), vitamin B₁₂, folic acid, and zinc. Although thiamin (vitamin B₁) is involved in the metabolism of proteins and fat and the formation of hemoglobin, it is also essential to optimal performance for its role in metabolizing carbohydrates. Vitamin B₁₂ is also involved in the metabolism of carbohydrates. Since folic acid is an integral part of a coenzyme involved in the formation of new cells, a lack of it can cause a blood disorder called megaloblastic anemia, which causes a lowering of oxygen-carrying capacity and thus negatively affects endurance activities. Zinc is also essential to your energy metabolic processes. Since alcohol depletes your zinc resources, the effect is an even greater reduction of your endurance.

Alcohol mainly affects the metabolism by inhibiting a process known as gluconeogenesis in which glucose is formed from substances other than glucose. When alcohol is oxidized by alcohol dehydrogenase (an enzyme), it produces an elevation of NADH, which ultimately reduces the amount of a coenzyme that is essential in the production of ATP. This loss of ATP results in a lack of energy and loss of endurance.

Adapted From:

Kuhn, C., Swartzwelder, S., & Wilson, W. (2000). Pumped: Straight facts for athletes about drugs, supplements, and training. New York, W.W. Norton.

Sports Nutrition: A Guide for the Professional Working With Active People 3rd Ed., C.A. Rosenbloom (American Dietetic Association, 2003)

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