Dietary Flavonoid Quercetin Increases VO_{2MAX} and Endurance Capacity

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Quercetin, a natural polyphenolic flavonoid substance present in a variety of food plants, has been shown in vitro and in animal studies to have widespread health and performance benefits resulting from a combination of biological properties, including antioxidant and anti-inflammatory activity, as well as the ability to increase mitochondrial biogenesis. Little is known about these effects in humans, however, especially with respect to exercise performance. The authors determined whether quercetin ingestion would enhance maximal aerobic capacity and delay fatigue during prolonged exercise in healthy but untrained participants. Twelve volunteers were randomly assigned to 1 of 2 treatments: (a) 500 mg of quercetin twice daily dissolved in vitamin-enriched Tang or (b) a nondistinguishable placebo (Tang). Baseline VO_{2max} and bike-ride times to fatigue were established. Treatments were administered for a period of 7 days using a randomized, double-blind, placebo-controlled, crossover study design. After treatment both VO_{2max} and ride time to fatigue were determined. Seven days of quercetin feedings were associated with a modest increase in VO_{2max} (3.9% vs. placebo; $p < .05$) along with a substantial (13.2%) increase in ride time to fatigue ($p < .05$). These data suggest that as little as 7 days of quercetin supplementation can increase endurance without exercise training in untrained participants. These benefits of quercetin may have important implications for enhancement of athletic and military performance. This apparent increase in fitness without exercise training may have implications beyond that of performance enhancement to health promotion and disease prevention.

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