

**The balance of bone health: tipping the scales in favor of potassium-rich, bicarbonate-rich foods.**

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Public health nutrition strategies to develop and maintain bone health throughout the lifecycle as well as to prevent osteoporosis in later life are urgently needed. In the United States, approximately 10 million Americans have osteoporosis, with costs estimated at \$17.9 billion per year and costs in Europe well in excess of 13.9 billion euros. This review article outlines the current evidence available in the literature linking potassium-rich, bicarbonate-rich foods to osteoporosis prevention. The health-related benefits of a high intake of potassium-rich, bicarbonate-rich foods (e.g., fruits and vegetables) on disease prevention (e.g., cancer, heart disease) have been gaining increasing attention in the literature, and there is growing belief, from a variety of observational, experimental, clinical, and intervention studies, that a positive link exists between potassium-rich, bicarbonate-rich foods and indices of bone health. However, observational studies are not hypothesis proving and can only suggest the potential mechanisms of action. We now urgently need data from randomized controlled trials to determine for certain whether a potassium-rich, bicarbonate-rich diet or supplement is important to the skeleton. A 1-mo dietary intervention study involving 23- to 76-y-old men and women has shown that a diet high in bicarbonate (high fruits and vegetables) and potassium (high in milk and dairy products) (Dietary Approaches to Stopping Hypertension) significantly reduces bone turnover. Longer-term dietary studies are critical. In addition, the mechanisms underlying a positive effect of a potassium-rich, bicarbonate-rich diet on bone need to be fully determined. These currently include, but are not limited to, 1) the potential role of the skeleton in acid-base homeostasis; 2) other nutrient or dietary components found in abundance in fruits and vegetables such as vitamin K, beta-carotene, and vitamin C; and 3) other as yet "unidentified" dietary components. The road ahead is a challenging one.