

Vitamin/Mineral Supplements and Athletics

Ann C. Grandjean EdD, FACN, CNS
Executive Director
International Center for Sports Nutrition



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Column Editor

THE USE OF DIETARY SUPPLEMENTS is commonplace in athletics. The percent of athletes reported taking dietary supplements varies significantly by study. For example, researchers have reported that anywhere from 23% to 58% of high school athletes and 6% to 76% of college athletes take supplements. Studies assessing the number of elite athletes who routinely take supplements have reported incidences ranging from 44% to 100% (4). Studies of elite athletes consistently report a higher incidence of supplement use than reported for the general public. Furthermore, the types of supplements taken by athletes and the reasons for using them vary.

Among high school athletes, the most common reasons given for taking supplements were growth, preventing illness, treating illness, performance, tiredness, and muscle development (4). Among female college athletes, reasons for taking supplements were the following: recommended by family member or friend (48%); prevent disease (31%); recommended by coach or trainer (29%); recommended by nutritionist or dietitian (26%); recommended by physician or pharmacist (25%); in-

adequate diet (24%); improve athletic performance (19%); feel better/increased energy levels (18%); present illness (17%); and build muscle (7%). Reasons given by male college athletes were to improve athletic performance (43%); build muscle (36%); recommended by family member or friend (31%); feel better/increased energy levels (29%); recommended by coach or trainer (25%); prevent disease (24%); recommended by nutritionist or dietitian (22%); inadequate diet (18%); present illness (14%); recommended by physician or pharmacist (5%) (2).

■ Vitamins and Minerals

The cyclists who led the pack in the 1939 Tour de France reported that their success was due to the vitamins they took. A 1982 survey of athletes residing at the Olympic training center in Colorado Springs found that 92% of the athletes surveyed routinely took vitamin/mineral supplements (A. Grandjean, unpublished data). Multivitamin/minerals were the most commonly used by American athletes participating in the 2000 Olympic

Summer Games, with 83% of the male athletes and 87% of the female athletes taking them (1).

Vitamins and minerals can affect training and performance via several mechanisms. A diet inadequate in vitamins and minerals can cause decrements in physical performance as well as impede tissue repair. Exercise may increase or alter the need for vitamins and minerals by stressing metabolic pathways or by increasing turnover. The requirements for some vitamins—such as riboflavin, thiamin, and niacin—are approximately proportionate to the metabolic demands of exercise training and the cumulative energy expense of training. Very intense or very high-volume training may produce suboptimal tissue concentrations of some vitamins or minerals. It is often assumed that as metabolic demands increase and the amount of food eaten increases to compensate for the increased caloric expenditure, the amounts of vitamins and minerals consumed increase; however, research on dietary habits of athletes shows this may not always be true. Additionally, evidence indicates

Table 1
Recommended Dietary Allowances and Upper Limits of Select
Vitamins and Minerals

Specific vitamin/mineral	RDA/AI		UL
	Men	Women	
Vitamin A ($\mu\text{g}/\text{d}$)	900	700	3,000
Vitamin C (mg/d)	90	75	2,000
Vitamin E (mg/d)	15	15	1,000
Vitamin K ($\mu\text{g}/\text{d}$)	120	90	ND
Thiamin (mg/d)	1.2	1.1	ND
Riboflavin (mg/d)	1.3	1.1	ND
Niacin (mg/d)	16	14	35
Vitamin B6 (mg/d)	1.3	1.3	100
Folate ($\mu\text{g}/\text{d}$)	400	400	1,000
Vitamin B12 ($\mu\text{g}/\text{d}$)	2.4	2.4	ND
Pantothenic acid (mg/d)	5	5	ND
Biotin ($\mu\text{g}/\text{d}$)	30	30	ND
Calcium (mg/d)	1,000	1,000	2,500
Chromium ($\mu\text{g}/\text{d}$)	35	25	ND
Iron (mg/d)	8	18	45
Magnesium (mg/d)	400–420	310–320	350
Phosphorus (mg/d)	700	700	4,000
Selenium ($\mu\text{g}/\text{d}$)	55	55	400
Zinc (mg/d)	11	8	40

Note: This table (taken from the DRI reports) presents recommended dietary allowances (RDAs) in **bold type** and adequate intakes (AIs) in plain type. RDAs are set to meet the needs of almost all (97–98%) individuals in a group. The AI for adults and gender groups is believed to cover needs of all individuals in the group, but lack of data prevents being able to specify the percentage of individuals covered by this intake.

UL = The maximum level of daily nutrient intake that is likely to pose no risk of adverse effects. Due to the lack of suitable data, ULs were not determinable (ND) for vitamin K, thiamin, riboflavin, vitamin B12, pantothenic acid, or biotin.

that supplemental vitamin C may protect against the increase in symptoms of respiratory-tract infections that are common in ultramarathon runners after a race. Of particular interest is that the runners on placebo had a mean intake of 490 mg of vitamin C from diet

alone, whereas the runners taking a 600 mg supplement had a mean combined intake (diet and supplement) of 1,139 mg; both groups were well above the 90 mg and 75 mg recommended for men and women, respectively. However, only the supplemented subjects had a

reduction in both incidence and duration of symptoms (3).

Vitamin and mineral supplementation is common among athletes and may be beneficial to meeting requirements not met by diet, and in some cases, may be beneficial in amounts higher than the re-

quirement. Table 1 lists the Dietary Reference Intake of select vitamins and minerals. It is important to monitor the vitamin and mineral intake of athletes in order to correct shortfalls and to modify excessive intake. When assessing vitamin or mineral intake, dietary sources as well as the amount from the supplement must be considered. ▲

■ References

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