

Riboflavin

Physiological Functions

Riboflavin is a water-soluble vitamin that supports energy metabolism and biosynthesis of a number of compounds through its coenzyme forms, flavin adenine dinucleotide (FAD) and flavin adenine mononucleotide (FMN). Riboflavin is also required for activation and support of activity of vitamin B6, folate, niacin, and vitamin K.

Factors Affecting Availability

Riboflavin is water soluble and heat-stable, but is sensitive to destruction by light. Because milk is a primary source of riboflavin, opaque containers or ultraviolet light-blocking materials are used in packaging to preserve the riboflavin content. Riboflavin can also be destroyed in the presence of alkali such as baking soda. As with other B vitamins, riboflavin is lost by milling of grains. To compensate for these losses, white flour is enriched with this vitamin. Riboflavin is not part of the vitamin enrichment mixture added to white rice because the addition of this vitamin imparts a yellowish cast.

Deficiency

Riboflavin deficiency is usually associated with deficiencies of thiamin and niacin. Signs of riboflavin deficiency are diffuse, but are typically observed in epithelial tissues and include scaly, dry skin, angular stomatitis (cracks in the skin at the corners of the mouth), cheilosis (fissuring of the lips), swollen purplish tongue, photophobia, and burning, itching eyes.

Toxicity

No known cases of riboflavin toxicity have been observed.

- ❖ *The upper limit of safety for riboflavin has not been determined due to lack of data substantiating adverse effects at high intakes. The Food and Nutrition Board of the Institute of Medicine recommends that riboflavin should be consumed only from food sources to prevent intake of potentially toxic levels.*

Requirements

The Daily Reference Intakes (DRI) for riboflavin are shown in the table below.

	Riboflavin (mg)
Infants	
0-6 mo	.3
7-12 mo	.4
Children	
1-3 y	.5

4-8 y	.6
Males	
9-13 y	.9
14-18 y	1.3
19-30 y	1.3
31-50 y	1.3
51-70 y	1.3
70 y	1.3
Females	
9-13 y	.9
14-18 y	1.0
19-30 y	1.1
31-50 y	1.1
51-70 y	1.1
70	1.1
Pregnancy	
18 y	1.4
19-30 y	1.4
31-50 y	1.4
Lactation	
18 y	1.6
19-30 y	1.6
31-50 y	1.6

Dietary Sources

Foods rich in riboflavin include liver, almonds, soynuts, shellfish, milk and other dairy products, and eggs. See table for dietary sources of riboflavin.

Dietary Sources of Riboflavin	
FOOD	Riboflavin (mg)
Liver, beef, 3.5 oz cooked	4.14
Almonds, _ cup	0.78
Soynuts, _ cup	0.65
Mackerel, 3.5 oz canned	0.54
Yogurt, low fat, 1 cup	0.52
Steamed clams, 3.5 oz	0.43
Milk, nonfat, 1 cup	0.34
Yogurt, fruit-flavored, low-fat, 1 cup	0.37
Clams, canned, 3 oz	0.36
Ice milk, soft serve, 1 oz	0.34
Egg, one cooked	0.25
Pork, roast loin, 3 oz cooked	0.24
Pasta, 1 cup cooked	0.23

Bagel, plain, one	0.22
Hamburger, lean, broiled med, 3.5 oz	0.21
Cheese, cottage, 2% fat, _ cup	0.21
Chicken, dark meat, 3 oz cooked	0.19
Spinach, fresh, ckd, _ cup	0.16
Wheat germ, raw, 2 Tbl	0.12