
How does the Handbook of Vitamins differ from a textbook on vitamins or a treatise or review of one particular vitamin? One expects a handbook to provide established facts, preferably quantitatively in a comprehensive, concise fashion without hypotheses and experimental details. The basic biologist, researcher, advanced student, clinician, or educator must be able to consult a chapter of the handbook on a particular vitamin and thereby gain instant entry into the topic, including the most recent discoveries and salient references. In addition, the concept of “vitamin” implies nutritional information that must be included. The Handbook of Vitamins fulfills these many conditions exceedingly well. The narrative is dense and balances biochemical with nutritional and clinical information.

For instance, flow diagrams illustrating nutritional or clinical information are extensively provided, although in some instances they can be overloaded, as in the overview of the vitamin D endocrine and paracrine systems. Nutritional information is generally concisely summarized in tabular form, such as “Causes of low level of plasma retinol” in humans. Real nuggets of normally hard-to-find information important to nutritionists are often included, for instance, the fact that the capacity of the adult human intestine and liver combined to metabolize \( \beta \)-carotene (about 12 mg/d) far exceeds the daily intake of \( \beta \)-carotene in the United States (1.5 mg/d).

The chapter on vitamin E explains with exceptional clarity the intricacies concerning interconversions of International Units of \( d \)-\( \alpha \)-tocopherol and \( dl \)-\( \alpha \)-tocopherol in supplement pills. A concise table details neurologic abnormalities of vitamin E deficiency, which is followed by extensive discussion of the current controversial efficacy of pharmacologic doses of vitamin E and adequate references.

The chapter on ascorbic acid presents a critical discussion of the multitude of studies of many diseases claimed to be influenced by this vitamin, including the use of high doses. The masterly chapter on vitamin B-6 has the character of a comprehensive review, with great emphasis on clinical aspects and the neurobiology of vitamin B-6.

An example of the general plan of the Handbook can be found in the chapter on folic acid, which includes the following sections: introduction, chemistry, food sources, bioavailability, assay methods, dietary reference intakes, metabolism, biochemical functions, deficiencies, risk of birth defects, summary, and conclusions.

New chapters added to the current 4th edition, not present in the 3rd edition, include a discussion of the role of vitamins in epigenetic events, such as modifications of chromatin by biotinylation of histone; niacin and chromatin structure; and chromatin modification by methylation, involving folic acid. A new chapter describes the accelerator mass spectrometric method, a new method in its infancy that allows experimental studies in humans of vitamin and mineral metabolism and turnover with minute physiologic concentrations. For example, this method was used to evaluate the kinetics of folate metabolism: 13 free-living adults received 0.5 nmol \( [14C] \)pteroylmonoglutamate labeled with 100 nCi, an insignificant level of radioactivity equivalent in radiation to 1 d of cosmic radiation at sea level. The enormous sensitivity of the method made it possible to follow \( 14C \) signals in plasma, erythrocytes, urine, and feces for 40 d.

A new chapter entitled “Dietary Reference Intakes for Vitamins” discusses “nutrient reference standards to be used for planning and assessing diets of apparently healthy individuals and groups.” It addresses estimated average requirements, recommended dietary allowances, adequate intakes, and upper intake levels and their interrelations. The chapter presents valuable tables of dietary reference intakes for all vitamins and a discussion of intake assessment and intake planning. It is clear that this handbook represents an important and outstandingly useful contribution from top experts in each vitamin field.

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