In numerous reports, investigators have cited surprisingly high rates of vitamin D deficiency in various populations throughout the world, including “healthy” persons living in developed countries, where it was thought that vitamin D deficiency was obsolete (1). Persons at particularly high risk of vitamin D deficiency include those with low exposure to sunlight (because vitamin D is produced in the skin from exposure to solar ultraviolet radiation), those with darker skin pigmentation or concealing dress codes, exclusively breastfed infants, the obese, and the elderly (as reviewed in references 2 and 3). Moreover, in an attempt to limit skin cancer, people are encouraged to use topical sunscreens generously and to spend less time outdoors during peak sunlight hours. This likely contributes to limiting the synthesis of vitamin D in the skin.

Accumulating evidence suggests that vitamin D may affect a vast array of biological systems and health outcomes. However, much of this research is in its infancy. This increasing interest in vitamin D–related hypotheses highlights the importance of valid methods for assessing vitamin D status.

The nature of assessing vitamin D status in large populations of free-living individuals is challenged by the difficulty of obtaining valid measures of sunlight exposure and oral intake of vitamin D that are not overly burdensome or expensive. Although blood measurements may be ideal, not all investigators have the resources available to obtain such specimens. Because of the breadth of public health benefits that adequate vitamin D status may have, it is important to determine how to best study this nutrient’s adequacy in large populations. The first step in addressing this question is to identify valid measurements of vitamin D status that can be used in population-based studies.

The purpose of the symposium “Assessment of Vitamin D Exposures in Population-based Studies,” which was held at Experimental Biology 2007 on 1 May 2007, was to examine the current challenges associated with assessing vitamin D status in population-based studies. The validity of various approaches currently used to assess vitamin D status (blood assays, dietary intake, and sunlight exposure) was reviewed. The goals of the symposium were to identify new avenues of research needed to better understand the reliability and validity of currently used assessment measurements of vitamin D status and to determine whether measurements of diet and sunlight exposure could be successfully used in population-based research to replace or supplement blood assays of 25-hydroxyvitamin D, the gold standard for vitamin D status.

The articles in this supplement summarize the 4 presentations given at the symposium: 1) an overview of the importance of vitamin D in health outcomes (4); 2) blood biomarkers of vitamin D status, with emphasis on 25-hydroxyvitamin D (5); 3) development of a US Department of Agriculture vitamin D nutrient database (6); and 4) the potential use of sunlight questionnaires to assess vitamin D exposure from sunlight (7). Finally, we also provide a discussion of directions for future research (8).

This symposium was sponsored by donations from the American Society for Nutrition, Kraft Foods, and the National Dairy Council.

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REFERENCES


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