

Pantothenic Acid

Function

Pantothenic acid has an essential role in metabolism because it is the functional form of coenzyme A, a substance with a central role in carbohydrate, fatty acid, and amino acid metabolism; in acetyl group transfers in the biosynthesis of steroids and porphyrins; and in the acetylation of some drugs (Plesofsky-Vig 1999). The name of the vitamin is derived from the Greek words meaning “from everywhere,” a term that aptly fits its widespread distribution in foods. Human deficiency of pantothenic acid is rare. Experimental deficiencies in animals produce a range of defects in growth, development, metabolism, and physiological function.

Safety Evidence

Toxicity of oral pantothenic acid is extremely low, and no cases have been reported in humans. Intakes as high as 200 mg per kg per day for animals and 10 g per day for humans have been tolerated without adverse effect (Miller and Hayes 1982; Food and Nutrition Board 1998). Although most studies relate to daily consumption of 5 to 10 mg, daily amounts as high as 10 g have been consumed in some clinical studies for many weeks without toxic effect.

Published Official Reviews of Pantothenic Acid Safety

The FNB found no reports of adverse effect of oral pantothenic acid in humans (Food and Nutrition Board 1998) and therefore did not establish a UL.

The UK EVM found no reports or clinical trial evidence of adverse effect of oral pantothenic acid or calcium pantothenate in humans and therefore no basis for a risk assessment (Expert Group on Vitamins and Minerals 2003). Thus, UK EVM did not set an SUL, but did establish a GL. This figure was derived from data showing an absence of adverse effect at supplemental intakes of 2,000 mg per day; a UF of 10 was selected to calculate a GL of 200 mg per day.

CRN ULS (OSL Method) for Pantothenic Acid

There are no reports of toxicity from oral administration on which a LOAEL value could be based. The clinical trial data (General Practitioner Research Group 1980) identified by UK EVM provided evidence that supplemental intakes of 2,000 mg did not produce adverse effects. The amount of available information

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is much smaller than desirable, but with the absence of adverse effects with daily intakes as high as 10 g, and systematic clinical experience with oral intakes of up to 1,000 mg per day (Komar 1991), 1,000 mg per day is selected as the CRN ULS (OSL) method.

<u>Comparison of Safety Values for Pantothenic Acid</u>	
CRN ULS (OSL method)	1,000 mg
US FNB UL	Reviewed but not established (no toxicological basis)
EC SCF UL	Reviewed but not established (no toxicological basis)
EC supplement maximum	Not established (as of May 2004)
UK EVM GL, supplement	200 mg

References

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Miller DR, Hayes KC. Vitamin excess and toxicity. In: Hathcock JN, ed. *Nutritional Toxicology*, vol. 1. New York: Academic Press, 1982; 81-133.

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