

My album

~50% of 'healthy' American elderly have low serum transcobalamin, diagnosing reduced vitamin B₁₂ absorption; 60% also have high serum homocysteine; none have low red cell folate: All elderly should get 25–100 µg oral free crystalline vitamin B₁₂ daily as food fortificant or supplement. V. Herbert^{1*}, M.A. Flynn², G.A. Nolph², G. Krause². ¹Mount Sinai and Bronx VA Medical Centers, New York City, NY 10468, USA, ²University of Missouri at Columbia, Columbia, MO 65212, USA.

Normally, of the total serum vitamin B₁₂ level, ~20% is on the delivery protein transcobalamin (TC; half-life = 6 min), and ~80% is on the circulating storage protein, haptocorrin (half-life = 2 weeks); every cell with a metabolic need for B₁₂ has receptors for TC, but only liver and other reticuloendothelial storage cells have receptors for haptocorrin (see citations in Herbert V. Vitamin B₁₂. In: Ziegler EE, Filer LJ, Eds. Present Knowledge in Nutrition (7th Ed), Chap. 20. Washington, DC, International Life Sciences Institute (ILSI) Press, 1996:191–205). Serum TC is low within a week of the start of persistent food B₁₂ malabsorption of any cause, and therefore is an ideal surrogate Schilling test (op. cit.). Low serum TC (and subtle neuropsychiatric and blood damage) may precede by months to a year or more, high serum HCY, high serum methylmalonate, and low total serum B₁₂ (op. cit.). Our group (Flynn MA, et al. J Am Coll Nutr 1997; 16:258–267) found in 171 (139 men, 32 women) healthy elderly Missouri Caucasians (mean age 65) that all 52 with HCY > 17.5 nmol/ml had low serum TC (< 60 pg/ml), but only 7 had total serum B₁₂ < 200 pg/ml. An additional 31 also had reduced food B₁₂ absorption measured by TC < 60 pg/ml, but did not yet have high HCY. All had normal red cell folate (> 136 ng/ml) and serum folate > 1.6 ng/ml; however, as expected, there was an inverse relationship between serum HCY and red cell (and serum) folate. Four decades ago, we showed (Ellenbogen L, Herbert V, Williams RR. Proc Soc Exp Biol Med 1958;99:257–259) that 1% of any oral dose (2 µg or 30 µg) of crystalline vitamin B₁₂ is absorbed by mass action in gastric atrophy (we used pernicious anemia patients). We petitioned our Government to mandate that a minimum of 25 µg vitamin B₁₂ be added to each portion of US Government-mandated (as of January 1, 1998) folate-fortified food, and all folate supplements (Herbert V, Bigaouette J. Am J Clin Nutr 1997;65:572–573).