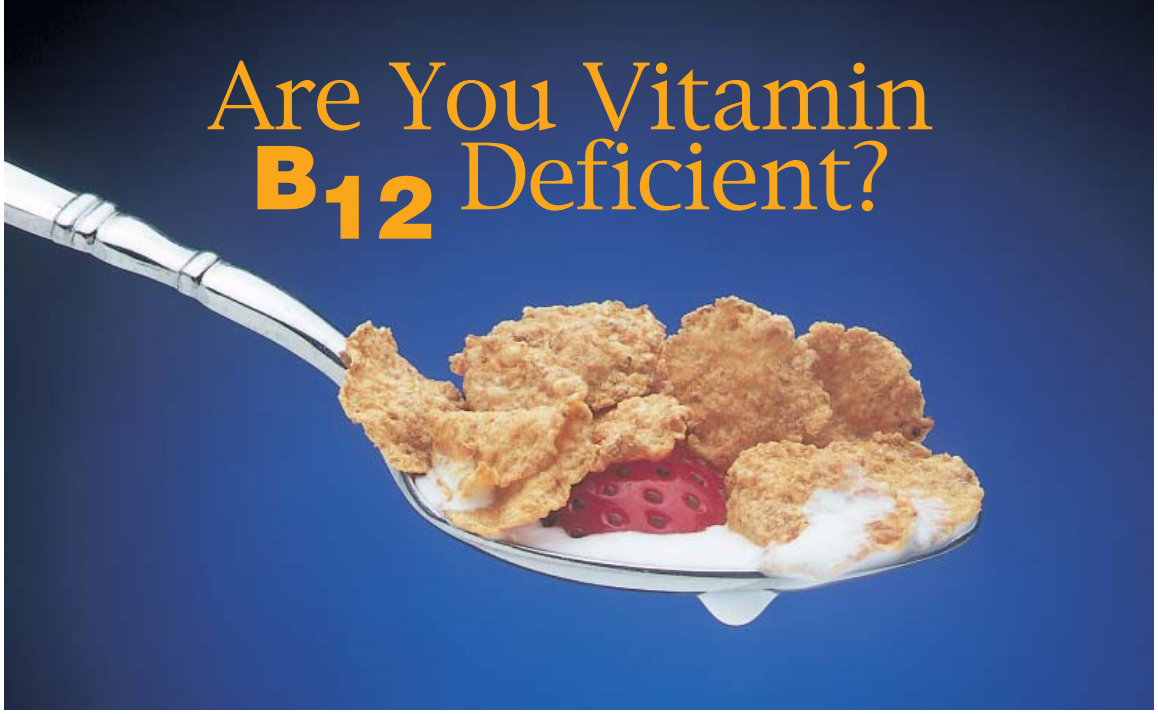
Are You Vitamin B_{12} Deficient?



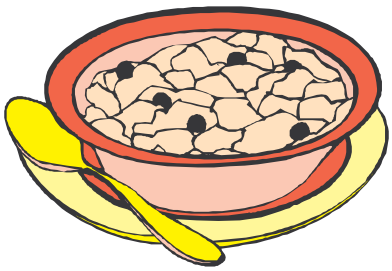
SCOTT BAUER (K8983-1)

Nearly two-fifths of the U.S. population may be flirting with marginal vitamin B_{12} status—that is, if a careful look at nearly 3,000 men and women in the ongoing Framingham (Massachusetts) Offspring Study is any indication. Researchers found that 39 percent of the volunteers have plasma B_{12} levels in the "low normal" range—below 258 picomoles per liter (pmol/L).

While this is well above the currently accepted deficiency level of 148 pmol/L, some people exhibit neurological symptoms at the upper level of the deficiency range, explains study leader Katherine L. Tucker. She is a nutritional epidemiologist at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University in Boston.

"I think there's a lot of undetected vitamin B_{12} deficiency out there," says Tucker.

She noted that nearly 9 percent of the study population fell below the current deficiency level. And more than 16 percent fell below 185 pmol/L. "Many people may be deficient at this level," she says. "There is some question as to what the clinical cutoff for deficiency should be."



Deficiency can cause a type of anemia marked by fewer but larger red blood cells. It can also cause walking and balance disturbances, a loss of vibration sensation, confusion, and, in advanced cases, dementia. The body requires B_{12} to make the protective coating surrounding the nerves. So inadequate B_{12} can expose nerves to damage.

Tucker and colleagues wanted to get a sense of B_{12} levels spanning the adult population because most previous studies have focused on the elderly. That age group was thought to be at higher risk for deficiency. The researchers also expected to find some connection between dietary intake and plasma levels, even though other studies found no association.

Some of the results were surprising. The youngest group—the 26 to 49 year olds—had about the same B_{12} status as the oldest group—65 and up. "We thought that low concentrations of B_{12} would increase with age," says Tucker. "But we saw a high prevalence of low B_{12} even among the youngest group."

The good news is that for many people, eating more fortified cereals and dairy products can improve B_{12} status almost as much as taking supplements containing the vitamin. Supplement use dropped the percentage of volunteers in the danger zone (plasma B_{12} below 185 pmol/L) from 20 percent to 8. Eating fortified cereals five or more times a week or being among the highest third for dairy intake reduced, by nearly half, the percentage of volunteers in that zone—from 23 and 24 percent, respectively, to 12 and 13 percent.

The researchers found no association between plasma B_{12} and meat, poultry, and fish intake, even though these foods supply the bulk of B_{12} in the diet. "It's not because people aren't eating enough meat," Tucker says. "The vitamin isn't getting absorbed."

The vitamin is tightly bound to proteins in meat and dairy products and requires high acidity to cut it loose. As we age, we lose the acid-secreting cells in the stomach. But what causes poor absorption in younger adults? Tucker speculates that the high use of antacids may contribute. But why absorption from dairy products appears to be better than from meats is a question that needs more research.

Fortified cereals are a different story. She says the vitamin is sprayed on during processing and is "more like what we get in supplements."—By **Judy McBride,** ARS.

This research is part of Human Nutrition, an ARS National Program (#107) described on the World Wide Web at http://www.nps.ars.usda.gov/programs/appvs.htm.

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