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Cartas al Editor

Will boron be essential for human nutrition?

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The importance of boron (B) as a micronutrient for vascular plants was proven by Katherine Warington in 1923 (1). Soon after this discovery, researchers also began to study whether B is essential for animal and human nutrition. Currently, the importance of Bfor human nutrition is not accepted or proven within the scientific community, and therefore continuesto be in question.The first evidence that B could be anessential micronutrient for humans was presented by Dr. Rex Newnham at the International Symposium on Trace Elements in Man and Animals^{-4} (TEMA^{-4}) held in Perth, Australiain 1981 (2). This author claimed that ingesting6 mg B day-1of sodium tetraborate could alleviate arthritic pain. In addition, Newnham et al. (3) reported that in countries with B intakes around 3 mg B day^{1} or less such as Jamaica andMauritius, the incidence of arthritis is near to 70%. However in countries such as Israel, Australia, and New Zealand where the B intakes is equal or higher than 6 mg B day-1, the incidence of arthritis on the population were absent or the incidence rate was less than 1%.With these results, he hypothesized that B is an important micronutrient for human metabolism. Recently published research reported that people older than 40 yearsof age can prevent and/or correct arthritis, osteoporosis, osteoarthritis, cancer (cervical and prostate) and cardiovascular diseases by taking B equal to or higher than 3 mg day^{-1} (4,5). This scientific finding is in agreement with what occurs with populations from Italy, Cyprus, and Turkey; in these countries the feeding is based on the famous healthy Mediterranean diet that includes staple foods rich in B such as grape, broccoli, garlic, tomato, pomegranate and olives combined with the consumption of drinking water with high levels of B, which frequently results in intakes of B higher than 13 mg day^{-1} person^{-1} (6). Several researchers (7,8) agree that in these countries, the high B intake explains why their population has been considered the healthiest in the world, especially those from Tuscany, Italy. There are three main sources that supply B for humans: 1).- Drinking water; 2).-Vegetable foods (mainly fruits and vegetables); and 3).- Products daily used for personal care (soaps, lipsticks, shampoo, skin cream, gastric antacids, cosmetics, detergents, contraceptives and estrogen supplements) (9,10,11). These sources,on average, supply aroundof 0.6, 1.0, and 0.5 mg B day^{-1} person^{-1}, respectively (6,11). Two sources of B that has been important since 1990 on the daily life of humans are supplements and nutraceuticals, which can supply between 3 and 10 mg B day^{-1} (12). Most supplements containB asinorganic compounds in the form of sodium tetraborate and boric acid as active ingredient (13). While nutraceuticals are produced using crops such as grape, broccoli, plum, peach, pomegranate and tomatothat accumulate B into organic forms such as fructoborates, amino acid ester borates, polyphenols and peptic polysaccharide borate complex,that are organic sources of B which are highly bioavailable (12), as well as beneficial metabolites and phytonutrients which help to maintain human health (14, 15, 16,17). The essentiality of B in humans is no yet widely accepted, but the scientific information indicates that to ensure an adequate nutrition, humans require between 2 and 6 mg B day^{-1} person^{-1} (2,18). In light of this evidence, countries such as Australia, England and USA where B intakes are lower than the sufficiency level have permitted sales of supplements and nutraceuticals that contain B in order to ensure that the population can meet their daily B requirements (6). Although there is evidence from the countries discussed, the global scientific community has no yet accepted that B is an important micronutrient for human nutrition and its important role in human metabolism (19); however

we are sure that in a short term the B essentiality for human will be proven, and when this occurs we finally understand why since 35 years ago Newnham recommended their use to prevent and correct arthritis and osteoporosis.

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