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LETTER TO EDITOR

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Minerals are important for health-what about boron?

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Dear Editor

Despite the well-established roles of minerals like calcium and iron in human physiology, the trace element boron remains conspicuously absent from mainstream nutritional discourse. This oversight persists even as accumulating evidence suggests boron plays critical roles in bone health, cognitive function, and immune regulation **[1]**. With global dietary patterns increasingly deficient in this micronutrient, the scientific community must urgently reconsider boron`s status as a likely essential element for human health.

Boron`s biochemical properties enable unique interactions with organic compounds fundamental to human metabolism. It forms stable complexes with molecules such as S-adenosylmethionine and NAD+, influencing crucial methylation and redox reactions **[2]**. These interactions extend to mineral metabolism, where boron enhances calcium retention and vitamin D utilization – effects demonstrated in clinical trials showing 2 mg/day supplementation reduces urinary calcium excretion by 44% while increasing serum vitamin D metabolites. Such findings may explain epidemiological observations linking higher boron intake with lower osteoporosis risk, particularly in populations consuming plant-rich diets **[3]**.

The neurological implications are equally compelling. Boron deprivation studies reveal impaired cognitive processing and motor coordination, while its ability to modulate neuronal calcium signaling and chelate neurotoxic metals like aluminium suggests potential protective effects against neurodegeneration **[4]**. These cognitive benefits may intersect with boron`s observed hormonal modulation, including its ability to elevate circulating levels of estradiol and testosterone in deficient individuals, effects that could prove significant for aging populations **[5]**.

Perhaps most urgently, boron appears to have immunomodulatory roles, enhancing leukocyte proliferation and interferón production. While these findings remain preliminary, they hint at broader implications for inflammatory and autoimmune conditions **[6]**. This is particularly relevant given the mineral`s apparent anti-inflammatory effects in arthritis patients observed in early clinical studies.

Despite these multifaceted benefits, boron suffers from remarkable scientific neglect. No established deficiency biomarkers exist, daily intake recommendations remain undefined, and the mineral is routinely excluded from nutritional surveillance programs. This oversight persists even in the face of evidence that modern processed diets frequently provide less than 1 mg/day, potentially below physiological requirements **[7]**. The parallels to historical cases like iodine are striking. Like iodine a century ago, boron represents a simple, low-cost nutritional intervention that could address multiple global health challenges.

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