

# Fertilizing Crops to Improve Human Health

16 macro and micronutrients are needed by crops, animals and humans

## MACRONUTRIENTS

An essential component of all proteins. A deficiency often results in stunted growth.



85%

Phosphorus is the second most abundant mineral in the body, after calcium. Found in almost every food, and as such, deficiencies are rare. Required for proper cell functioning, regulation of calcium, strong bones and teeth, and to provide energy to our cells.



73%

An activator or cofactor in enzymatic reactions. Potassium deficiency only occurs during prolonged fasting. Adverse effects with deficiency include cardiac arrhythmias, muscle weakness, and glucose intolerance.

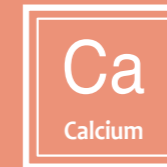


55%

## Percentage of soils deficient in each nutrient



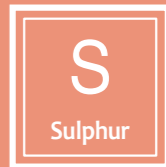
Indispensable for skeletal function with 99% in bones and teeth, calcium also helps with vascular function, muscle contraction, nerve transmission and hormone action.



A low magnesium status is associated with ageing ailments, including atherosclerosis, hypertension, osteoporosis, diabetes mellitus, and some cancers.



Component of several amino acids essential to humans. Except for vegan diets, deficiencies are rare. Sulphur is needed for production of keratin and helps to keep hair, skin, bone, cartilage and tendons strong and healthy.



## MICRONUTRIENTS

49%



Deficiency weakens the immune system. Due to the central role of zinc in cell division, protein synthesis and growth, zinc is particularly important for young children, adolescents and pregnant women.

31%



Essential in plant growth and gaining acceptance as an essential element for animals and humans.

23%



A lack of iron is the most common nutritional disorder in humans worldwide and is most prevalent in the developing world. Symptoms of iron deficiency include anemia, poor growth and labored breathing after mild exercise.

15%



Though a rare genetic disorder, a deficiency of the molybdenum co-factor usually results in premature death in early childhood.

14%



An antioxidant for humans, copper is essential for the immune and nervous system, skeletal health, for iron metabolism and for the formation of red blood cells. Deficiencies lead to anemia.

10%



Manganese deficiency has not been reported for humans. However, symptoms observed in livestock are impaired reproductive performance, skeletal deformities and shortened tendons.



The latest confirmed nutrient essential to plants. Not essential for animals or humans. Soil deficiencies lead to a decrease of plant productivity.



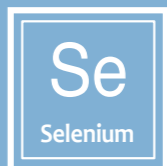
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14%



Iodine deficiency disorders are cause of the mental impairment of nearly 20 million babies annually during pregnancy and the development of hyperthyroidism (goitre).

14%



For humans, selenium has antioxidant, anti-inflammatory, anti-cancer, anti-viral and anti-ageing benefits.

Iodine and selenium are only beneficial to animals and humans.



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