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Strategies for Closing Global Nutrient Gaps: Enhancing Distribution and Supply

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Abstract

Although current estimates suggest that global food production is enough to meet nutritional needs, there are still significant challenges with equitable distribution(1). Tackling these disparities is essential for achieving global nutrition security now and in the future. This study uses the DELTA Model® to analyse global nutrient supply dynamics at national resolution and address nutritional shortfalls in specific countries(2). By examining the distribution of food commodities and nutrients in 2020, we project the future food and nutrient production needs for 2050 to ensure adequate global supply. Our findings indicate that while some nutrients are sufficiently supplied on a global scale, many countries face significant national deficiencies in essential nutrients such as vitamins A, B12, B2, potassium, and iron. Addressing these gaps will require substantial increases in nutrient supply or redistribution. For example, a 1% increase in global protein, targeted at countries with insufficient protein, could close the 2020 gaps. However, if current consumption patterns persist, the global food system will need a 26% increase in production by 2050 to accommodate population growth and changing consumption patterns. Our study developed a framework for exploring future production scenarios. This involves reducing surplus national nutrient supply linearly over decades while simultaneously increasing production of undersupplied nutrients. This framework provides a more practical assessment of future needs, transitioning from idealized production scenarios to realistic projections. Our study investigated a potential future for nutrient supply to meet minimum requirements by 2050. Calcium and vitamin E are crucial, and production must be increased to address significant gaps, given their severe deficiencies in 2020. Energy and fibre production will be required to peak between 2030 and 2040 before stabilizing back near 2020 levels. Predicted changes in nutrient supply from 2020 to 2050 vary: while calcium and vitamin E will need to increase, phosphorus, thiamine and the indispensable amino acids can decrease without compromising global nutrition with only minor redistribution. These results are essential for determining the food supply required to achieve adequate global nutrient supply in the future. Incorporating these insights into global food balance models will provide key stakeholders with evidence, refine future projections, and inform policy decisions aimed at promoting sustainable healthy diets worldwide.

Keywords: Food systems; Mathematical modelling; micronutrients; sustainability; inequality

Ethics Declaration: Yes

References

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