

In Environmental Challenges the Role of Dietary Supplements

Researchers examined how environmental challenges intersect with dietary supplements to identify research gaps related to [biological resilience](#), ecological impacts, and nutrient deficiencies. They concluded that substantially more rigorous, interdisciplinary, and longitudinal research is urgently needed to determine whether, under which circumstances, and for whom dietary supplements might play a role in supporting public health, resilience, and nutrition security in the face of unprecedented environmental change.



Study

Environmental disruptions are increasingly undermining food systems and public health. Climate-related stressors, such as extreme heat, altered rainfall patterns, droughts, floods, and ecosystem changes, impact every stage of [food supply chains](#), from production and processing to distribution and affordability.

Such disruptions threaten nutrition and food security by limiting access to diverse, nutrient-rich foods and increasing the risk of diet-related [diseases](#) and nutrient deficiencies, with disproportionate effects on already vulnerable populations.

Despite this growing risk, nutrition science remains underrepresented in environmental health research. In particular, the role that dietary supplements might theoretically play in addressing environmentally driven [nutrition](#) challenges has not been systematically examined, and existing evidence remains fragmented and context-dependent, limiting generalizability.

Addressing Nutrient Gaps Resulting from Environmental Threats

Environmental change affects both the quantity and quality of food. Evidence shows that rising carbon dioxide levels can reduce the concentrations of key nutrients in staple crops such as wheat and rice. Temperature increases and ecosystem disruption also threaten animal-sourced foods and fisheries, potentially reducing intake of high-quality [protein](#), essential fatty acids, vitamins, and minerals.

Pollinator loss further compounds these risks by reducing the availability of fruits, nuts, seeds, and vegetables, which are critical sources of micronutrients such as folate and [vitamin A](#). Together, these changes could increase the prevalence of undernutrition, micronutrient deficiencies, and nutrition-related chronic diseases, although the magnitude, timing, and population-level distribution of these effects remain uncertain.

Dietary supplements have been proposed as one possible tool to help fill emerging [nutrient gaps](#), particularly for populations at higher risk, including older adults, individuals living with chronic conditions, pregnant women, and children, in settings where food-based strategies are insufficient or disrupted.

However, important uncertainties remain. Research is needed to identify which nutrients are most affected, under what [environmental conditions](#), and in which populations. Supplement strategies must also account for safety, bioavailability, unintended consequences, and the commercial and social determinants of health, rather than assuming uniform benefit or nutritional equivalence to whole foods.

Findings

Extreme weather events provide a clear example of how [environmental stressors](#) affect nutrition. In the United States alone, hundreds of billion-dollar disasters have disrupted food access and affordability. However, nutrition outcomes are often overlooked in disaster response planning, despite their potential long-term health consequences and cumulative effects across repeated exposures.

Emergency nutrition assistance often prioritizes calories over nutritional quality, leading to diets high in sodium, [added sugars](#), and saturated fats, and low in fruits, vegetables, and fiber.

Although federal guidance suggests including supplements in emergency [food stockpiles](#), there is little evidence-based guidance on the appropriate doses, delivery methods, and nutrient types. This highlights a major research gap in disaster preparedness and recovery, rather than a basis for immediate implementation or routine deployment.

While adaptation strategies are essential, mitigation efforts are equally important. Dietary changes aimed at decreasing environmental impact can introduce new nutritional challenges, including risks of iron, zinc, and [vitamin B12](#) inadequacy. Supplements may become increasingly important in certain contexts as diets change voluntarily or in response to disruptions in the food system, particularly during transitional periods.

At the same time, the environmental footprint of the dietary supplement industry remains poorly quantified. The sourcing of animal-based and botanical ingredients, along with packaging, processing, and transportation, may contribute to [carbon emissions](#), deforestation, overfishing, and pollution. Research is needed to evaluate the full lifecycle impacts of supplements and to explore sustainable alternatives, such as plant-based omega-3 sources, while avoiding unintended ecological harm or problem-shifting across environmental domains.

Conclusion

The authors emphasize substantial methodological challenges, including isolating supplement effects within complex [diets](#), conducting long-term evaluations that align with gradual environmental change, and ensuring product safety and quality.

Regulatory frameworks in the [United States](#) further complicate research and application, as dietary supplements are not required to demonstrate efficacy before marketing and lack standardization across brands, limiting the strength of population-level guidance and comparability across studies.

Equity and affordability are central concerns to ensure that supplements do not increase financial burdens or replace efforts to address upstream food system problems. Instead, they should be considered only as complementary tools within broader [public health](#) and environmental strategies, rather than as primary solutions to structurally driven nutrition insecurity or substitutes for systemic food policy reform.

Source:

<https://www.news-medical.net/news/20260119/Can-dietary-supplements-support-nutrition-security-as-climate-change-disrupts-food-systems.aspx>