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# Climate Change on Our Plates

## Why nutrition is becoming an invisible casualty

Climate change is often discussed in terms of visible changes such as shrinking glaciers, rising sea levels, and more frequent floods, droughts and heatwaves. Although, a major impact is happening more quietly: it can reduce the nutritional quality of the food we eat every day. This concern was the central theme of a recent Round Table discussion on TRT World, moderated by journalist Enda Brady, which brought together three experts in agriculture, environmental health and public health nutrition. In their discussion, they cited a growing body of data indicating that rising atmospheric carbon dioxide (CO<sub>2</sub>) levels are altering global food production systems and lowering the nutrient content of essential food crops.<sup>1</sup>

The esteemed participants alongside Brady were Professor Matin Qaim, who holds the Chair of Agricultural Economics at the University of Bonn; Professor Sumantra (Shumone) Ray, a Public Health Nutritionist and founder of the NNEdPro Global Institute for Food, Nutrition and Health; and Dr Lewis Ziska, an Associate Professor of Environmental Health Sciences. Collectively, they delved into the implications of this transformation for agriculture, public health, social equity, and the future of global nutrition.

### When more growth means less nutrition

The central problem is that it involves a paradox. For plants to grow, carbon dioxide is required. Certain crops may develop more quickly as a result, but there are drawbacks to this, as Dr Ziska pointed out. Plants may absorb more carbon when atmospheric CO<sub>2</sub> levels rise, but their intake of soil nutrients like iron, zinc, magnesium and nitrogen may not increase at the same rate. This can upset the equilibrium between carbon gain and nutrient availability. This leads to a diluting effect: while crops might have more carbohydrates and calories, they contain considerably fewer critical micronutrients.<sup>2</sup> Research shows that basic crops like wheat, rice, potatoes and tomatoes grown in increased CO<sub>2</sub> conditions typically have lower iron and zinc concentrations and lower protein levels.<sup>3</sup> These nutrients are vital for the immune system, cognitive growth and overall health. Dr Ziska emphasised that this imbalance is unlikely to self-correct. Without interventions, this widening imbalance could cause widespread micronutrient deficiencies, particularly in areas that rely primarily on plant-based food sources.

### Agriculture at a crossroads: quantity, quality & equity

The nutritional stakes are obvious, but Professor Matin Qaim was careful not to reduce the problem to a neat 'quantity versus quality' trade off. The world still needs food in volume: demand continues to rise with population growth, urbanisation and changing diets. At the same time, climate change is already destabilising harvests through droughts, heat stress and more frequent weather extremes, and the pressure is often greatest in low and middle income settings where food insecurity is already part of daily reality.<sup>3,4</sup> Prof Qaim's point was straightforward: we cannot afford to chase yield alone, but we also cannot

pretend that quality can be prioritised in isolation. The harder task is both protecting productivity while safeguarding nutrient density. That means thinking in integrated ways: breeding crops that retain micronutrients, improving agricultural practice, and backing this shift with policies that make them possible for farmers and markets. He also touched on a structural issue that modern farming has leaned into for decades: genetic uniformity. It helps with predictability and scale, which is important when you are feeding millions, but it can narrow the nutritional range of what is grown and eaten. Encouraging greater crop and varietal diversity, and making nutrient richer varieties more attractive through incentives or procurement policies, could be part of rebuilding that balance.<sup>4</sup>

### Beyond supplements: a food first approach

A question that naturally comes up is whether supplementation becomes the default answer if food itself is losing nutritional value. Prof Ray clarified that supplements can be valuable, especially for diagnosed deficiencies or particular life stages but they do not replace the wider benefits of a varied diet.<sup>6</sup> And in practice, heavy reliance on supplements can distract from the bigger picture: what people can actually access, afford and sustain as daily eating patterns. Prof Ray returned instead to what he described as strengthening the 'backbone' of diets: adequate protein, key micronutrients and genuine diversity across food groups. He also highlighted something that often gets overlooked in public discussions: what happens after food is bought. Everyday culinary choices of how food is prepared, which ingredients are combined, and what cooking methods are used can meaningfully influence nutrient availability.<sup>7</sup>



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Importantly, he framed this not as an idealised solution for wealthy households, but as a practical direction even in economically constrained contexts. Education and skill building interventions, he suggested, are not an optional add on, they can be a core part of improving nutrient intake in the community. Initiatives such as the Mobile Teaching Kitchen Initiative (MTKi) were referenced as an example of how knowledge and hands-on skills can translate into affordable, micronutrient-adequate meals for marginalised communities.<sup>8</sup> Beyond delivery, MTKi functions as a public-facing implementation tool to raise awareness, build intention, and support contextual adaptation, and is currently being implemented across all four country settings involved in this work (India, Mexico, US & UK).

### The overlooked risk of toxins

The discussion also moved beyond nutrient loss to another, less comfortable dimension: contamination. Dr Ziska and Prof Ray both drew attention to evidence and ongoing research around heavy metals and other toxins entering the food chain, including substances such as lead, mercury and arsenic.<sup>8</sup> The health implications are serious especially for neurological development and long-term cognitive outcomes. A key point here is that the body can eliminate some toxins, but only up to a limit. With repeated exposure, heavy metals can accumulate in tissues over time, and the burden becomes harder to reverse.<sup>8</sup> As Prof Ray noted, awareness has to be grounded in data, without measurement and risk assessment, 'clean eating' becomes a slogan rather than a public health strategy.

### The role of journalism in making the invisible, visible

A subtle but powerful realisation that came through the programme was the role of journalism itself. Throughout the discussion, Enda Brady repeatedly returned to a central question: why is this issue not more widely known?

Climate change is already a permanent headline, yet the nutritional consequences can feel abstract because they are not immediately visible. Food still looks familiar, and nutrient erosion tends to unfold gradually rather than dramatically. In that context, the value of programmes like Round Table is not just that they host expert voices, but that they create a bridge between specialised evidence and public understanding. When journalism translates technical findings into accessible stories, it does more than inform. It can shift what policymakers

consider urgent, widen public literacy around 'nutrient security', and keep attention on problems that do not announce themselves loudly. In a topic like this, where the risk is slow, structural and easy to overlook, that role matters immensely.

In short, if climate change is silently reshaping the nutritional makeup of the foods we eat, journalism becomes one of the few tools capable of turning that invisibility into a story that can be acted upon.

### From food security to nutrient security

By the end of the discussion, the message was clear: As climate pressures intensify, the challenge is to protect the nutritional integrity of food systems while ensuring fair access. Responding will require coordination across agriculture, public health, science, education and policy. Maintaining public awareness of these concerns also requires ongoing public participation along with informed journalism. The food on our plates may look unchanged, but the programme made the case that its nutritional story is shifting. Recognising this shift, and acting on it early, is central to sustaining meaningful progress toward the 2030 Sustainable Development Goals, particularly those linked to zero hunger, health equity and climate resilience.

### Key takeaways

- Rising atmospheric CO<sub>2</sub> levels may act as a nutrient diluter, increasing crop yields in terms of calories while reducing the density of essential vitamins and minerals.
- Staple crops such as rice, wheat and pulses may experience significant declines in protein, iron and zinc content, nutrients critical for immune function, growth and cognitive development.
- Populations may continue to meet caloric needs yet face worsening hidden hunger, with implications for stunting, micronutrient deficiencies, and metabolic disease risk.
- Elevated CO<sub>2</sub> may not only dilute nutrients, but also increase heavy metal accumulation in certain crops.
- These changes may exacerbate existing nutrition and health inequities, underscoring the need for targeted monitoring and policy action.

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