GLOBAL DAIRY PLATFORM

Perspective Paper

When Nutrition Counts: Rethinking Food System Sustainability

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KEY TAKEAWAYS:

- Food system sustainability must be assessed across environmental, nutritional, and socio-economic dimensions.
- Including nutrition in sustainability assessments repositions the value of foods and reveals important trade-offs.
- Broader, multi-dimensional approaches to assessment help ensure systems that deliver health within environmental and socio-economic constraints.

Over the last two decades, researchers have made significant progress in understanding the environmental impacts of food systems. Life Cycle Assessment (LCA) and related approaches have enabled researchers, policymakers, and the private sector to quantify greenhouse gas emissions, land and water use, and other environmental pressures associated with food production.

Now, the conversation is evolving. There is growing recognition that sustainability, in the context of food systems, is not simply about reducing environmental impact, but also about delivering adequate and equitable nutrition, improved public health, accessible and affordable diets, sustainable livelihoods, and broader socio-economic outcomes.

This raises a fundamental question: are food systems being assessed in a way that reflects the full range of outcomes they are expected to deliver?

While current metrics assess the environmental impact of food production, they do not necessarily capture the value of what food provides. This reflects a broader limitation: no single metric can fully capture the multiple dimensions of value that food systems deliver.

Recognizing this gap, a growing number of researchers are exploring ways to better align environmental assessment with nutritional value. Approaches such as nutrition-sensitive LCA (nLCA) aim to incorporate metrics of nutrient density, bioavailability, and dietary contribution into environmental evaluations. As these methods continue to evolve, and while methodological challenges remain, research is clearly moving toward more integrated frameworks that better reflect both environmental and nutritional performance.

As assessments become more refined, there is an opportunity to reconsider how sustainability is interpreted to help ensure the food system is fit for the future.

Accounting for Nutrition Changes the Value of Foods

Applying a more integrated lens to food system assessment is not only a conceptual shift, but it also has practical implications for how foods are evaluated within a healthy, sustainable global food system. A growing number of **studies** have explored what happens when environmental

impacts are assessed alongside nutritional contribution.[1] These analyses use a range of approaches, including nutrient density scores, protein quality adjustments, and metrics focused on priority micronutrients. While methods differ, a consistent observation emerges: the relative performance of foods can change when nutritional value is considered.

For example, **research** examining environmental impacts relative to priority micronutrient provision shows that foods can shift in their comparative rankings depending on how they are assessed.[2] Foods that appear more resource-intensive on a per-kilogram basis can perform more favorably when evaluated based on their contribution to addressing nutrient gaps. Similarly, **analyses** incorporating nutrient density and bioavailability demonstrate that comparisons based solely on mass, calories, or single nutrients may not reflect the full role that foods play in supporting healthy diets.[3]

Importantly, these approaches do not eliminate differences in environmental impact between foods. Rather, they provide additional context, highlighting that environmental performance and nutritional value are not always aligned, and that trade-offs are inherent within food systems. They also underscore the broader point that there is no single metric that can fully capture the value of food.

Food contributes across multiple dimensions, including nutrition, health, culture, affordability, and environmental impact. Attempts to reduce this complexity to a single score risk oversimplifying decisions that are inherently multi-dimensional. Instead, emerging **evidence** points toward the need for complementary metrics that can be interpreted together.[4]

Within this more nuanced framework, foods such as dairy illustrate the importance of considering the full complexity of the equation. Dairy products provide a combination of essential nutrients, including high-quality protein, calcium, and vitamin B12, in forms that are widely bioavailable. At the same time, like all foods, they have environmental impacts that must be managed and reduced. When assessed through a single lens, these characteristics can appear in tension. When assessed together, they offer a more **balanced view** of contribution and impact.[5]

This shift, from comparison to context, is central to understanding how food systems can be evaluated, and ultimately improved, in ways that reflect their full purpose. This more complete understanding of food value is important not only for how we assess foods, but also for how we define the purpose of food systems themselves – namely, their ability to support human health.

From Nutrition to Health

At its core, the value of food systems lies in their ability to support healthy populations. Nutrition is a primary determinant of health across the life course, influencing physical growth, cognitive development, immune function, and healthy aging. At the population level, improved nutrition is associated with reduced disease burden and contributes to economic productivity and social resilience.

This connection is central to how food system sustainability should be understood. A system that minimizes environmental impact but fails to deliver adequate nutrition would not meet its fundamental purpose. Equally, a system that delivers nutrition but exceeds environmental limits cannot be sustained over time. The objective, therefore, is not to prioritize one outcome over

another, but to align nutrition, health, and environmental performance to drive socio-economic resilience.

Recent work by **Beal and Ortenzi** from the Global Alliance for Improved Nutrition reinforces this point, introducing a Nutritional Value Score that evaluates foods based on both nutrient density and their associations with noncommunicable disease risk.[6] Their findings highlight the importance of considering overall nutritional value, not just single nutrients or environmental impacts, when assessing food system performance. Within this context, the role of nutrient-rich foods becomes clearer. By providing multiple essential nutrients in accessible and widely consumed forms, they can support dietary adequacy without requiring excessive complexity or cost.

Dairy is one example, contributing nutrients that are commonly under-consumed around the world, even in regions with sufficient supply, and does so in forms that are bioavailable and utilizable by humans. At the same time, the sector continues efforts to reduce environmental impact and improve efficiency.

Advancing Thoughtful Food System Design

The growing recognition that environmental, nutritional, and socio-economic outcomes must be considered together has important implications for how food system decisions are made. It also signals that the next phase of progress is not only about refining metrics, but about how they are applied in practice.

An important shift is underway, from evaluating individual foods in isolation toward understanding how whole diets perform across multiple dimensions. This shift matters because food choices are not made one item at a time. They are shaped by dietary patterns that must meet nutritional needs while also reflecting real-world constraints, including affordability, availability, and cultural acceptability.

Emerging approaches to dietary modeling are beginning to reflect this complexity. Frameworks such as the **iOTA model®** demonstrate how diets can be designed to simultaneously account for nutritional adequacy, environmental impact, affordability, and cultural acceptability.

When these dimensions are **considered together**, the resulting dietary patterns are often more nuanced than those derived from single-objective analyses.[7] Rather than converging on uniform solutions, they reveal multiple pathways to achieving sustainable and healthy diets. Importantly, these pathways are context-specific.

Dietary shifts that are appropriate in one region may not be feasible, or even desirable, in another. Differences in food availability, cultural practices, economic conditions, and nutritional needs all influence what constitutes a sustainable diet in practice. This reinforces a key insight that sustainable food systems are not defined by a single optimal diet, but by a range of viable dietary patterns that meet nutritional needs within environmental and socio-economic constraints. Within these patterns, foods such as dairy often continue to play a role, reflecting their contribution to nutrient adequacy, accessibility, and dietary diversity in many regions.

As tools evolve, they can be applied in ways that better reflect how food systems operate in reality. This creates an opportunity for policymakers, researchers, and industry to move beyond

single-metric comparisons and toward more holistic, context-sensitive approaches to food system transformation.

Measuring What Matters for the Future of Food

There is sufficient evidence to recognize that single metrics cannot fully capture the value of food, particularly when foods are consumed as part of broader dietary patterns. This creates an opportunity.

For policymakers, it means designing frameworks that reflect environmental, socio-economic, and nutritional goals. For researchers, it means continuing to refine methods that capture the multi-dimensional nature of food systems. For industry, it means advancing environmental performance while clearly communicating the value that food delivers across multiple aspects of a healthy, sustainable global system.

More broadly, it means shifting the conversation - from simply asking which foods have the lowest environmental impact, to examining: how can food systems deliver the greatest nutritional and societal value within environmental boundaries? When that question is placed at the center, a more balanced and actionable understanding of sustainability emerges – one that is better aligned with the realities of feeding people, supporting communities, and sustaining the planet.

DAIRY LEADERSHIP: A CALL TO ACTION

The dairy sector has an opportunity to lead in shaping more integrated approaches to sustainability. This includes continuing to improve environmental performance, while clearly articulating the nutritional value dairy provides within healthy dietary patterns.

Leadership will require collaboration across industry, academia, and policy to ensure that emerging methodologies are robust, transparent, and relevant.

By embracing this more holistic perspective, the dairy sector can help advance a food system that delivers environmental progress, and improved nutrition and socio-economic outcomes.

For more information on the Global Dairy Platform's Perspective Papers, please reach out to Dr. Beth Bradley at beth.bradley@globaldairyplatform.com.

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