

Controlling Methane from Beef and Dairy in the Global South

Event

Global methane emissions from livestock, particularly in the Global South, are rising due to increasing beef and dairy demand. While the Global North has reduced emissions through productivity gains, the Global South faces challenges in adopting similar measures, risking unsustainable methane emission growth.

Significance

Livestock production accounts for one-third of all human-induced methane emissions, with the Global South responsible for most recent increases in these emissions. As methane is 28 times more potent than carbon dioxide over a 100-year period, addressing these emissions represents a crucial opportunity for near-term climate mitigation. However, rapidly growing protein demand in developing regions – particularly in Africa where animal protein consumption may double by 2050 – threatens to dramatically increase emissions unless production efficiency improves significantly. Current mitigation policies remain inadequate for smallholder farmers who dominate livestock production in key countries like India and Brazil, highlighting the need for scalable solutions tailored to these production systems.

Analysis

While reducing meat consumption could lower emissions in developed nations (where annual per capita beef consumption averages 20-30kg), this approach remains impractical across most of the Global South, where protein-deficient populations consume less than 5kg of beef annually and rely on livestock for essential nutrition. Plant-based alternatives, despite global investment exceeding \$2 billion in 2022, face persistent hurdles including production costs 30-50% higher than conventional meat, unfamiliar taste profiles, and cultural significance of livestock in rural economies – resulting in less than 1% market penetration across Africa and South Asia.

Feed additives like Bovaer (approved in 64 countries) and seaweed demonstrate strong mitigation potential in trials (30-80% reductions), but face adoption challenges in pasture-based livestock systems that comprise 80% of Global South production, due to distribution difficulties, large scale production, and costs. Emerging methane vaccines, currently in field trials in Australia and Kenya, show promise for small landholder systems with their twice-yearly dosing regimen, but require efficacy improvements from current 10-15% reductions to at least 20% to become viable. Methane vaccines may also require financial mechanisms like carbon credits to drive implementation, though current markets face verification challenges and lack infrastructure for smallholder participation.

The most proven solution – productivity enhancements through improved genetics, balanced feed rations, and veterinary care – has demonstrated dramatic results, as seen in Brazil's 41% reduction in emissions intensity since 1980 through productivity improvement. However, these gains require coordinated investments in improved animal breeds, better feed, and veterinary care, while carefully balancing economic impacts for smallholder households who derive their income from livestock.

India's dairy sector exemplifies this challenge, where productivity gains through crossbreeding programs have increased since 1980, yet methane intensity remains high due to persistent reliance on low-quality crop residues as feed. Without targeted interventions combining these approaches, FAO projections suggest Global South livestock emissions could grow 25% by 2030, undermining climate goals while failing to meet the 50% increase in animal protein demand expected across developing nations by 2050.

Conclusion

To effectively curb methane emissions without jeopardizing food security, the Global South must prioritize productivity-led mitigation strategies, beginning with scaling controlled-feeding systems and feed enhancements like Brazil's ABC+ program and India's Harit Dhara additive. Critical investments in breeding technologies, including heat-resistant cattle varieties and expanded veterinary services, would significantly boost yields while reducing emissions intensity. Simultaneously, developing reliable carbon markets with strong verification mechanisms could provide crucial incentives for smallholder participation. These efforts must be complemented by regionally tailored policies that both modernize production systems, particularly through cooperative models, and safeguard small farmers' livelihoods. Without such urgent, coordinated action, projected increases in livestock production will entirely offset potential climate gains, making it imperative for policymakers to integrate methane reduction strategies with broader agricultural development initiatives to ensure sustainable, climate-resilient growth across the sector.

The research article this is based on can be found by [clicking here](#).