



Dr. Verghese Kurien Memorial Oration Reimagining Indian Dairying for a Sustainable and Inclusive Future*



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* Dr. R.S. Paroda delivered the “Dr. Verghese Kurien Memorial Oration” on the inaugural day of the 52nd Dairy Industry Conference (DIC) at the Yashobhoomi Convention Centre, New Delhi.

Distinguished members of the Indian Dairy Industry and Indian Dairy Association, dairy scientists, professionals and leaders, dairy farmers, ladies and gentlemen,

It is both an honour and a privilege to deliver today, Dr. Verghese Kurien Memorial Lecture. I thank the organisers for this opportunity and congratulate the representatives of dairy industry for its sustained contribution to India's progress in dairy sector over the decades.

It is an honor to speak about Dr. Verghese Kurien—a visionary par excellence whose life and work transformed not merely an agricultural subsector, but led to significant rural development in India. Dr. Kurien did not simply build a dairy industry; he built institutions, self-confidence, and the dignity among millions of small producers. He turned milk into a movement, and producers into owners.

Today, as we remember him, the most fitting tribute is not the nostalgia, but an introspection and reimagining of Indian dairy sector for yet faster and sustainable growth.

Dr. Kurien's Enduring Legacy

Dr. Kurien's genius lay in his clarity of purpose. He believed that farmers—especially the smallholders—must control the means of production, processing, and marketing. His insistence on producer ownership, professional management, and political independence became the bedrock of the cooperative dairy and cradles of White Revolution in India.

Operation Flood, guided by the philosophy of Dr. Kurien, was not merely a technological or logistical initiative. It represented a profound social revolution proving that rural India could organize, compete, and succeed on its own terms. The transformation of India from a milk-deficient nation into the world's largest milk producer achieving almost fourteen fold increase to 248 mt in 2024-25 stands as a powerful testament to his enduring vision and leadership.

Having had personal association with him, let me confess that he was a great son of India, a foresighted person, an excellent administrator and a constructive critic. He stood against complacency, excessive bureaucracy, and dilution of cooperative values. His principles remain relevant even today—perhaps more than ever. I personally tried to imbibe these while working to strengthen the national agricultural research system and realised how difficult was to follow these values.



Indian Dairying Today: Achievements and Anxieties

India's dairy sector stands as a pillar of the country's agriculture and rural economy. Milk production contributes around 5 per cent to national GDP, provides livelihood security to over 80 million rural households, and remains one of the most inclusive economic activities in the country, empowering small and marginal farmers, women and landless labourers. Yet, despite these achievements, there are underlying problems that create stress within the system.

India is the world's largest milk producer today, with production reaching 248 million tonnes in 2024-25, contributing almost 25% of global production. Per-capita availability has increased over the years to 485 grams per day, which is higher than the norms of ICMR which is 280gms per day. The dairy sector, driven by over 303 million bovines (around 200 million cattle and 100 million buffalo), produces a wide range of products including ghee, butter, and yogurt, with exports (reaching 1.13 lac mt in 2025) mainly to UAE, Saudi Arabia, Bahrain, USA, and Egypt. The top milk producing states are Uttar Pradesh (15.6%), Rajasthan (14.8%), Madhya Pradesh (9.1%), Gujarat (7.7%), and Maharashtra (6.7%). Cattle milk dominates with over 54% of production (133 mt), followed by buffalo milk (107 mt), and goat milk (8 mt).

Our main concern is that productivity per animal is still around 2.5 to 3.0 litres per day, which needs to be increased to at least 10 litres per day. Also the cost of production is rising. Climate change is affecting fodder availability, animal health, and water resources. Informal markets still continue to dominate. Youth participation is invariably declining, and while women perform a majority of dairy operations, yet their ownership and decision-making power remains a challenge.

The cooperative sector itself faces challenges of governance, professionalism, and competitiveness in an increasingly liberalized and globalized market.

These are not failures; these are signals that the next phase of dairy development cannot be a simple extension of the past. Business as usual will not help, we shall have to change and make dairy sector more organized, efficient and outward looking. We need to think globally and act locally.

From Quantity to Quality: A Necessary Transition

For decades, our primary metric of success had been the volume—more milk, more procurement, and more processing capacity. While this focus was necessary in

the early years, the future demands a paradigm shift from quantity to quality, from volume to value, and from expansion at low subsistence to more scientific, productive and globally competitive profession. Such a shift would demand holistic professional reorientation and reimagining of dairy sector as a whole.

Consumers today are asking new questions:

- How safe is my milk?
- How nutritious is it?
- How was it produced?
- What is its environmental footprint?

The right answers to these questions will define market competitiveness in the coming decades. Traceability, quality assurance, value addition, and branding will become more important than just procurement volumes and selling as liquid commodity. In fact, the success of Amul lay in branding and popularisation of its products—as was achieved through famous Amul baby girl with a tagline "Utterly Buttery, Delicious".

This transition calls for investment in science, standards, and skills—areas where institutions like the ICAR-National Dairy Research Institute (NDRI) and Indian Dairy Association have a critical role to play.

Climate Change and the Dairy Dilemma

One of the most pressing challenges before the dairy sector is climate change. Livestock is both a victim of climate stress and, at times, perceived as a significant contributor to greenhouse gas emissions - especially the methane from bovines.

The solution to sustainable dairying does not lie in simplistic narratives, but in context-specific innovation. India's dairy sector is largely smallholder-based, integrated with cropping systems, and embedded in circular rural economies. This distinct structure gives us unique opportunities for low-emission, and resource-efficient dairy systems that are both environmentally sustainable and economically resilient.

Climate-resilient breeds, improved housing and feeding strategies, better manure management, proper fodder and feed diversification, and energy-efficient processing can significantly reduce the environmental footprints while improving farmer's income.

Hence, the challenge lies in positioning Indian dairying as part of the climate solution, and not a problem.

Women: The Invisible Pillar of Indian Dairying

No discussion on dairying can be complete without acknowledging the central and pivotal role of women. Women feed animals, manage milk, maintain hygiene,



and ensure continuity of operations—often while remaining invisible and unrecognised for their significant contribution towards white revolution and its sustainability.

I am convinced that true transformation of the dairy sector will be impossible without recognizing and empowering women as farmers, entrepreneurs, and leaders. This would require enabling policy environment through access to assets, credit, training, digital tools, and leadership positions within cooperatives and dairy organizations, including farmer producer organizations (FPOs).

Therefore, in my view empowering women in dairying is not a welfare measure; it is a productivity strategy and a social investment, which we must aim while marching towards *Viksit Bharat*.

Technology as an Enabler, Not a Disruptor

Digital technologies, artificial intelligence, genomics, and precision livestock farming offer exciting opportunities for dairy sector as disruptive innovation. However, technology must serve the smallholder being a reality of Indian dairying. There is an urgency to convert unorganized sector into more successful and organized small scale dairies taking advantage of new innovations and their scaling for efficient production and value chain for marketing.

In this context, the goal should not be to replace farmers, but to augment their capabilities—through better animal health services, market better knowledge dissemination, extension delivery, livestock insurance and risk management through market linkages—both within and internationally.

Reimagining Cooperatives for the 21st Century

Perhaps the most important question we must ask today is: How would Dr. Kurien have designed India's dairy institutions if he was to start it now?

The answer does not lie in abandoning cooperatives, but in reorienting them—strengthening their governance, ensuring accountability, attracting professional talent, and restoring much needed trust and confidence among members as producer owners.

Cooperatives must remain market-savvy, innovation-driven, and youth-friendly, especially the women. Without young professionals and young farmers, the future of dairying shall remain uncertain. What we need now is to improve productivity, profitability and diversity in dairy products through value addition branding and export.

The Role of the Indian Dairy Industry and Association

The Indian Dairy Association occupies a unique position

as "Think Tank" a knowledge platform, professional body, and conscience keeper, serving the dairy sector to promote its faster growth and development.

In the years ahead, in my view IDA and Dairy Industry can play a pivotal role in:

- Shaping evidence-based dairy policies
- Bridging science and practice
- Building human capital
- Promoting ethical, efficient and sustainable dairying
- Facilitating dialogue across cooperatives, private sector, academia, and the government for future growth of dairy sector.

In doing so, IDA would be carrying forward the true spirit of Dr. Kurien—not as an icon frozen in history, but as a living philosophy to serve the nation more effectively and aggressively.

What Made Kurien Different

As I reflect on Dr. Kurien's legacy, I am struck by one defining quality: clarity of conviction and commitment to serve society with human face. He knew exactly what he stood for and never deviated from his principles. He believed deeply that farmers must own the institutions they built, that professionals must manage them, and that politics may neither interfere nor control them.

He often reminded us that cooperatives are not meant to be the charitable organizations, nor instruments of the state, but business enterprises owned by producers. This clarity was the foundation on which Operation Flood had succeeded.

Dr. Kurien did not romanticize farmers, nor did he underestimate them. He trusted their capability, intelligence, respected their dignity, and built systems that allowed them to compete with the best within and the outside world. That, in my view, is his most remarkable contribution.

Personal Reflections from a Career in Agriculture

Having worked for decades across various facets of agriculture and rural development, I have witnessed policies change, priorities shift, and narratives evolve.

Few sectors, however, have shown the resilience and inclusiveness of dairying. In times of drought, price volatility or crop failure, dairy has often become a lifeline of rural livelihoods. I have seen myself as to how a regular milk payment—however modest—can provide food and nutrition security, pay for school fees, and preserve dignity of a household.

Yet, I have also seen how institutional fatigue can set in

when success is taken for granted. This is where Dr. Kurien's legacy becomes most relevant—not as celebration, but as a caution. We therefore, must guard against complacency.

Conclusion: Carrying the Flame Forward

Ladies and gentlemen,

Dr. Verghese Kurien once said that India's place in the world would be determined by how well it used its own strengths. Indian dairying is one such strength—rooted in millions of households, shaped by cooperation, served by science and sustained by resilience.

For faster growth of dairy sector, greater attention would, henceforth, be needed in areas:

- Intensifying research on: (i) use of sexed-semen and sexed-embryos of elite animals; (ii) use of biotechnological tools to improve productivity and genetic upgradation, (iii) achieving higher conception rate using elite bull semen; and (iv) using genome editing technique and adopting genomic selection (GS) approach along with prediction of bull and cow fertility at early calf-hood.
- Commercial exploitation of non-bovine milk (goat, sheep, camel and donkey) in view of their medicinal, nutraceutical, vitamin and micro-mineral properties, and explore the potential of their export.
- Improving the indigenous breeds of livestock (cattle, buffalo, goat) that are well adapted to biotic and abiotic stresses; early diagnosis of animal health disorders and their redressal; and developing resilient animal production systems and the reduction of GHG emissions from the ruminants.
- Promoting use of high technology-based semen-quality control tests to ensure quality of frozen semen.
- Developing improved feed and fodder varieties and hybrids and their efficient production and use, for which enhanced funding and effective coordination and convergence between Ministries is badly needed.
- Developing efficient milk production system driven by entrepreneurs and youth with institutional support, monitoring and hand holding; streamlining credit facilities and ensuring no GST on dairy products to make

them more affordable for consumers and export.

- Doubling the processing capacity from current 53.5 m tons to > 100 m tons, build more cold chain facilities, and AI infrastructure across the country.

In conclusion, I would like to mention that India has great potential to remain world leader in the dairy sector, for which we must ensure farmer-oriented policies in place. We also need to have now an aggressive approach to capture global market through value addition of dairy products, needed diversification of products, reorientation of export policies, and widening the milk marketing network.

Today, as we honour and commemorate the legacy of Dr. V. Kurien, let us reaffirm our commitment to a dairy sector that is farmer-centric, woman-empowered, climate-responsible, globally competitive and economically viable for the benefit of us all.

Let us ensure that the next chapter of Indian dairying is written not just in the litres of milk.

That, I believe, would be the most meaningful tribute to our legendary Dr. Verghese Kurien, a great son of India, who transformed Indian dairy sector and spearheaded as father of 'White Revolution'

Let us also urge the policy makers to consider bestowing on him being a great son of our nation- 'Bharat Ratna', which he richly deserves posthumously.

Thank you and Jai Hind.

