

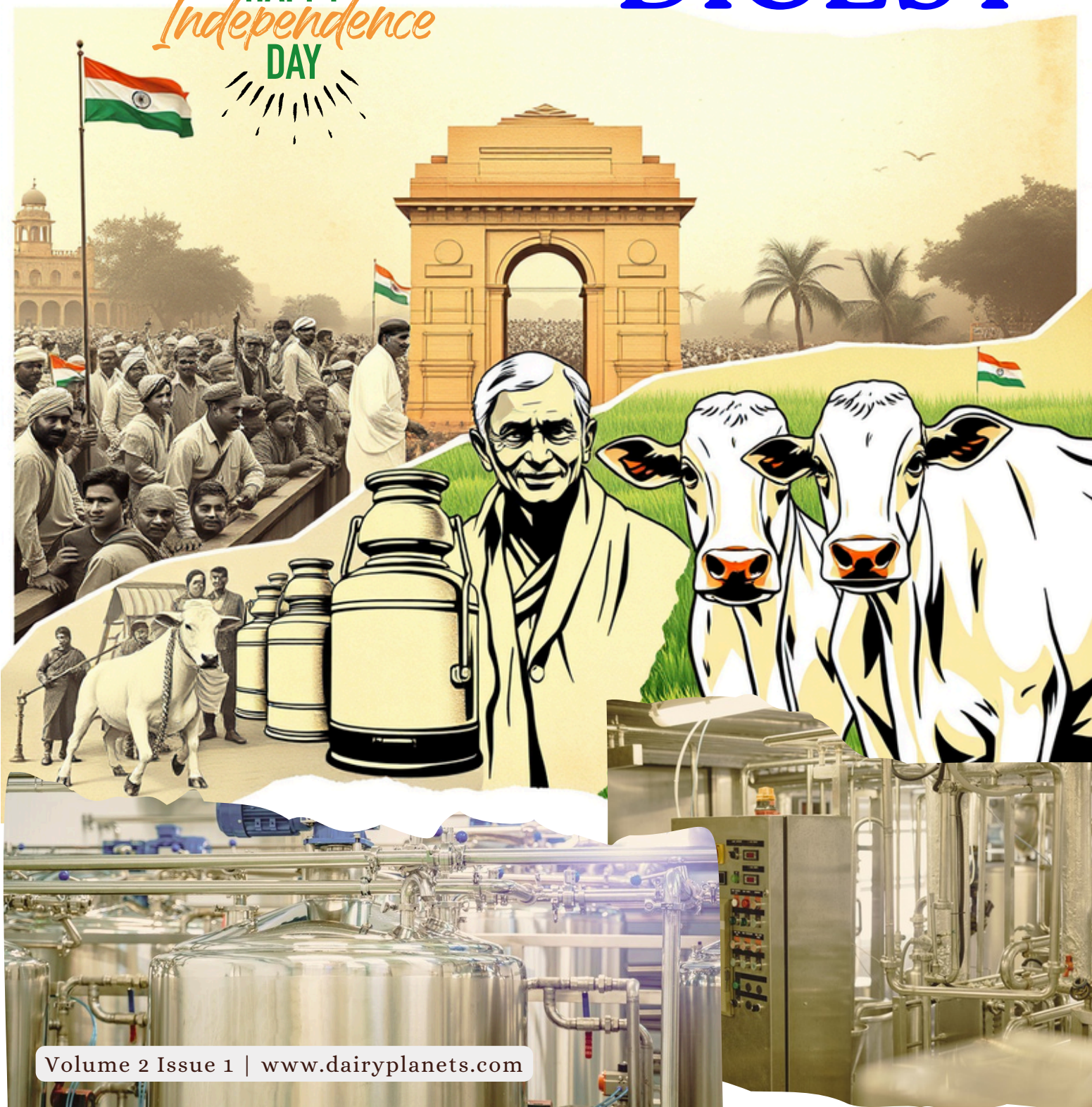


July 2025

Your daily dose of dairy insights - join Dairy Planet today!

Dairy Planet DIGEST

HAPPY
Independence
DAY



About Us



Dairy Planet is an educational and knowledge-based digital platform committed to empowering students, professionals, and stakeholders in the dairy and food technology sectors. The initiative bridges the gap between academic theory and industry practice through curated content, e-learning resources, expert mentorship, and collaborative community engagement.

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Mission

- To support B.Tech Dairy Technology and Food Technology students with syllabus-based e-courses, practical tools, short notes, and exam-prep resources.
- To empower dairy farmers through scientific training and awareness programs for quality milk production.
- To connect dairy professionals, startups, and institutions for knowledge exchange and skill development.
- To create multilingual, interactive content for enhanced learning and outreach across rural and urban segments.

Vision

To become India's most trusted digital ecosystem for dairy and food technology education, enabling academic excellence, innovation, and inclusive growth in the dairy sector.



Be a Voice in the Dairy Revolution – Join Dairy Planet!

Are you passionate about dairy science, technology, or the business of milk?

Dairy Planet is building a global learning hub for dairy students, technologists, entrepreneurs, and enthusiasts — and we want YOU to be part of it!



Do you have knowledge, skills, and experience that can inspire and educate the next generation of dairy professionals?

Dairy Planet is more than a platform – it's a vibrant hub for dairy professionals, students, and enthusiasts across the globe. Now, we are opening our doors for Instructors, Content Creators, and Industry Experts to join our mission of empowering the dairy community with knowledge, innovation, and inspiration.

Who Can Join?

Dairy & Food Technology Professionals
Industry Experts with Proven Experience
Passionate Educators in Dairy Science, Technology, and Business
Creative Content Developers & Researchers
Students & Young Professionals with a Flair for Communication and Innovation

REGISTER NOW



Your knowledge can change the future of dairy!

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**BE A PART OF OUR NEXT MAGAZINE
ISSUE!**

💡 **SHARE YOUR ARTICLES, INSIGHTS,
OR VALUABLE CONTENT AND INSPIRE
THE DAIRY COMMUNITY.**

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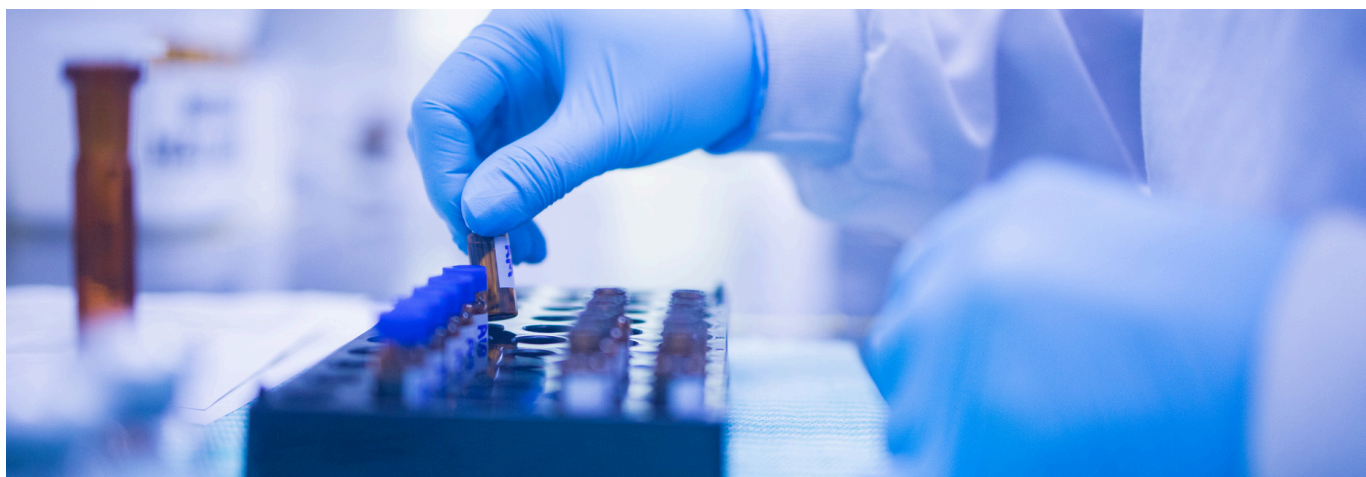


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FROM FOUNDER'S DESK

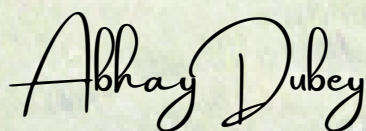
Dear Readers,

It brings me immense joy to welcome you to this special relaunch edition of Dairy Planet Digest — a quarterly magazine crafted to inform, inspire, and connect the vibrant community of dairy farmers, technologists, entrepreneurs, students, and enthusiasts.

This issue carries a theme close to my heart: "From Freedom to Self-Sufficiency – India's Dairy Transformation." As we approach the anniversary of our nation's independence, we reflect on how the journey from Swaraj to the White Revolution transformed India into the world's largest milk producer. Within these pages, you'll find thought-provoking articles, insightful case studies, technical deep dives, and practical resources designed to help you stay informed and ahead in the evolving dairy industry.

In our Farmer's Corner, we've dedicated space in Hindi to ensure accessibility and direct benefit for our dairy heroes in the fields. You'll also discover industry news, infographics, mind maps, and even a few brain teasers to keep the learning lively. For our young readers and aspiring dairy professionals, we hope these stories spark new ideas and inspire innovation.

As always, this magazine is not just about sharing information — it's about building a community. I invite you to contribute your expertise, stories, and innovations. Together, we can churn knowledge into progress and make Dairy Planet the global voice of the dairy industry. Thank you for being part of this journey. Let's continue to grow, learn, and innovate — one page, one idea, and one story at a time.



FOUNDER
DAIRY PLANET

Dear Readers,

It is with immense joy and gratitude that I welcome you to this edition of Dairy Planet Digest. As the Admin, I have the privilege of working behind the scenes to ensure every page you read reflects the passion, dedication, and vision of our incredible team.

This magazine is more than a collection of articles — it's a bridge between knowledge and community. Each story, interview, and visual has been chosen to inspire, educate, and celebrate the dairy industry in all its richness. Whether you are a farmer, student, entrepreneur, or enthusiast, our aim is to make these pages a place where you find value, motivation, and a sense of belonging.

We believe in the power of shared ideas. Your voices, experiences, and feedback shape the future of this magazine. Together, we can not only share stories but also create them — stories of innovation, resilience, and progress in the dairy world.

Thank you for being a part of the Dairy Planet family. Let's keep learning, growing, and celebrating the journey of dairy together.

Vicky Kumari

ADMIN
DAIRY PLANET

संपादक की कलम से,

वर्तमान समय में, डेयरी और खाद्य उद्योग दुनिया के सबसे तेज़ी से विकसित हो रहे क्षेत्रों में से एक है। प्रतिदिन राष्ट्रीय और अंतरराष्ट्रीय स्तर पर नई तकनीकें, प्रक्रियाएँ, अनुसंधान परिणाम और इनोवेटिव प्रोडक्ट्स विकसित हो रहे हैं। ऐसे दौर में, उद्योग से जुड़े लोगों, विद्यार्थियों और शोधकर्ताओं के लिए यह आवश्यक हो जाता है कि उन्हें समय पर अथॉरिटेटिव और रिसर्च-बेस्ड जानकारी उपलब्ध हो। इसी आवश्यकता को ध्यान में रखते हुए Dairy Planet का हर अंक इस मिशन के साथ प्रकाशित होता है कि वह डेयरी एवं फूड सेक्टर से जुड़े सभी हितधारकों तक सटीक, अद्यतन और प्रमाणित जानकारी पहुँचा सके।

Dairy Planet की विशेषताएँ:

- **वैश्विक और राष्ट्रीय कवरेज** – विश्वभर की अग्रणी डेयरी और फूड कंपनियों द्वारा किए गए नवीनतम आविष्कार, टेक्नोलॉजी डेवलपमेंट, प्रोसेस इम्प्रूवमेंट और नए उत्पादों की जानकारी; अंतरराष्ट्रीय स्तर पर बदलते बाजार रुझानों और नीतिगत परिवर्तनों की समय पर जानकारी।
- **छात्रों के लिए अमूल्य स्रोत** – Dairy and Food Technology के विद्यार्थियों के लिए एक अद्वितीय मंच, जहाँ वे अकादमिक ज्ञान के साथ-साथ उद्योग में हो रहे वास्तविक बदलावों और व्यावहारिक नवाचारों से भी परिचित हो सकते हैं; प्रोजेक्ट्स, रिसर्च थीसिस और सेमिनार प्रेजेंटेशन के लिए प्रामाणिक डेटा और केस स्टडी।
- **उद्योग पेशेवरों के लिए मार्गदर्शक** – क्वालिटी कंट्रोल, प्रोसेसिंग टेक्नोलॉजी, सप्लाय चैन मैनेजमेंट, पैकेजिंग इनोवेशन और सस्टेनेबिलिटी पर आधारित गहन आलेख; मार्केट एनालिसिस, उपभोक्ता व्यवहार और बिज़नेस स्ट्रैटेजी पर विशेषज्ञों के विचार।
- **प्रामाणिकता और विश्वसनीयता** – सभी सामग्री विश्वसनीय समाचार स्रोतों, वैज्ञानिक शोध पत्रों, उद्योग रिपोर्ट्स और आधिकारिक घोषणाओं पर आधारित; पाठकों को केवल तथ्यपरक और सत्यापित जानकारी ही प्रदान की जाती है।
- **नवाचार और प्रेरणा का संगम** – हर अंक केवल जानकारी नहीं, बल्कि नए विचार, प्रेरणा और भविष्य की संभावनाओं की दिशा भी देता है; उभरते हुए शोध क्षेत्रों, नई प्रोसेसिंग तकनीकों और इंडस्ट्री 4.0 के डेयरी-फूड सेक्टर पर प्रभाव पर विशेष कवरेज।

Dairy Planet क्यों है खास?

यह पत्रिका केवल समाचारों का संकलन नहीं, बल्कि एक ज्ञान मंच है, जो अकादमिक जगत और उद्योग के बीच की दूरी को कम करता है। यहाँ दी गई जानकारी न केवल आपकी समझ को व्यापक बनाती है, बल्कि करियर और व्यवसायिक अवसरों के नए रास्ते भी खोलती है। चाहे आप एक विद्यार्थी हों, शोधकर्ता, डेयरी फार्म मालिक, प्रोसेसिंग यूनिट ऑपरेटर या पॉलिसी मेकर—Dairy Planet आपको नवीनतम ज्ञान, ट्रेंड्स और तकनीकी प्रगति से जोड़ता है।

निष्कर्ष

Dairy Planet का उद्देश्य केवल जानकारी देना नहीं, बल्कि डेयरी और फूड सेक्टर में एक सशक्त ज्ञान इकोसिस्टम तैयार करना है, जहाँ से प्रेरणा, शोध और नवाचार की धारा सतत बहती रहे। यह पत्रिका उन सभी के लिए है जो इस उद्योग के विकास में अपनी भूमिका निभाना चाहते हैं और नवीनतम प्रगति के साथ कदम से कदम मिलाकर चलना चाहते हैं।

“ज्ञान, नवाचार और प्रगति – Dairy Planet के हर अंक में”



MANAGING EDITOR
DAIRY PLANET



Celebrating 79 Years of Freedom: Naya Bharat, Naya Dairy Daur

– Dairy Planet Editorial Team

As India steps into its 79th year of independence, the theme **“Naya Bharat”** reflects a nation brimming with fresh aspirations, innovation, and self-reliance. Dairy, the lifeline of rural India, stands at the forefront of this transformation.

From **Operation Flood** to becoming the **world’s largest milk producer**, our dairy sector has already been a symbol of empowerment and progress. Now, in the era of *Naya Bharat*, we envision a dairy industry that is:

- **Technologically advanced** – leveraging AI, IoT, and automation to boost productivity
- **Sustainable** – adopting eco-friendly practices for a greener future
- **Inclusive** – empowering farmers, especially women, with fair opportunities and global market access
- **Value-driven** – creating world-class products that carry the “Made in India” pride

In Naya Bharat, the dairy sector is not just an industry — it is a symbol of empowerment for millions of rural families, especially women, who are the backbone of milk production. As we celebrate our freedom, let’s also celebrate the resilience, hard work, and innovation that keep our nation nourished.

Just as **“Naya Bharat”** dreams of a stronger, self-reliant nation, the New Dairy Era dreams of **milk from every village reaching every corner of the world**, carrying the taste and trust of India.

This Independence Day, let’s raise a glass of milk — fresh, pure, and proudly Indian — to toast the journey ahead.

Here’s to a Naya Bharat — richer in spirit, stronger in unity, and creamier in every cup of chai!





From Swaraj to Self-Sufficiency: Tracing India's Dairy Awakening

– Vicky Kumari & Abhay Kumar Dubey

"In every crisis, if you look carefully, you will spot an opportunity. My insistence is on finding and seizing that opportunity. I never try to sidestep a crisis. Rather, the more monstrous the crises, the more I am tempted to rush at it, grasp it by the horns, and man-oeuvre it until it gives me what I want."

Dr. Varghese Kurian

In today's world, everybody wakes up with a sip of tea or coffee; without this, people cannot start their day. Now you can feel the importance of milk or its products in daily life. Milk is not only essential for beverages like tea and coffee, but also for a variety of breakfast foods such as cereal, oatmeal, and smoothies. Its versatility and nutritional value make it a staple in many households around the world.



Long before the world coined the term “superfood,” India was living it — in the form of milk, curd, ghee, and butter.

These dairy products have been staples in Indian cuisine for centuries, providing essential nutrients and contributing to overall health and well-being. They are not only delicious but also versatile ingredients that can be used in a wide variety of dishes. In the Vedic period, milk wasn't just a dietary staple; it was sacred currency for health, spirituality, and culture. Ancient Ayurvedic texts describe ghee as Amrit (nectar) for the body, improving digestion, memory, and vitality. Tales from the Mahabharata bring the imagery of a young Krishna stealing butter, turning dairy into a symbol of abundance and joy. The cultural significance of milk and ghee in Indian history is deeply rooted in tradition and mythology, highlighting their importance beyond just culinary purposes. These dairy products continue to play a central role in Indian rituals, ceremonies, and everyday life, symbolizing prosperity and happiness.

In those times, the dairy economy wasn't about profits and exports — it was about community, sustenance, and ritual. The sacred cow holds a revered place in Hindu culture, with milk and ghee being seen as divine offerings. The act of sharing dairy products was a way of fostering unity and connection among people, creating a sense of belonging and abundance within the community. Every household was its own dairy plant, and milk connected the farmer directly to the consumer with no middlemen, no processing plants — just purity in its rawest form. This deep connection to dairy products in Hindu culture has been passed down through generations, continuing to hold significance in modern times. The sacred cow remains a symbol of unity, abundance, and spiritual nourishment for many individuals practicing Hinduism today.



Colonial Churn: When the Cream Was Taken Elsewhere

Between 1848 and 1947, India was entirely under British rule. At that time the British Government interfered in almost all the sectors of Indian society, but only interference in the dairy sector happened in 1943. During World War II, the British government imposed strict regulations on dairy production in India to ensure a stable food supply for their troops. This interference led to significant changes in the dairy industry and had lasting effects on the economy. The British colonial period disrupted India's centuries-old, self-sufficient dairy rhythm. What was once a locally consumed, community-driven cycle of milk, curd, ghee, and buttermilk now began bending to serve the priorities of the empire. Large-scale dairy production was diverted to meet the needs of the British army, railways, and colonial administrators. Milk became less a village staple and more a commodity to be extracted, transported, and consumed by the ruling elite. This shift in focus caused a decline in traditional dairy practices and the marginalization of small-scale producers.

For the Indian farmer, this meant two blows — the cream was literally and figuratively skimmed away. While they still tended their cows and buffaloes, they faced chronically low prices, exploitative middlemen, and a lack of organized chilling, processing, and storage facilities. Rural dairying stayed locked in subsistence mode, unable to tap into growing urban demand. As a result, many small-scale producers struggled to make a sustainable living from dairy farming. Without access to proper infrastructure and fair market opportunities, they were unable to benefit from the increasing demand for dairy products in urban areas. This perpetuated the cycle of poverty and limited economic growth in rural communities dependent on dairy farming.



This interference was due to the sickness that affected the British people living in Bombay by consuming contaminated milk. After that, the British government sent the milk sample to Britain for testing, results revealed that the milk quality in Bombay was as poor as British sewage water, resulting in the establishment of a milk commission and department to ensure milk quality. The first mission of the department was to find the area from where the sample quantity of

milk is produced, and they found Khaira Anand in the present Gujrat. In the British period, milk production in the Khaira district drastically increased when the Polson Company started a butter factory there. Transporting milk from Khaira to Mumbai, 463km away, was not easy. Still, the Polson Company made it possible by regularly keeping milk cans in jute bags by the natural pasteurizing method. It made a monopoly over the milk production in Anand and its adjacent areas. Polson Company didn't pay the fair price of milk because the farmers of Anand faced many problems that affected their livelihood. Eventually organized themselves and formed the Kaira District Co-operative Milk Producers' Union Limited in 1946, which later became Amul.



This marked the beginning of a successful cooperative movement that revolutionized the dairy industry in India. There were pockets of export activity, especially in clarified butter. Ghee from Sindh and Punjab traveled to the Middle East via Karachi port, while Bengal and Bihar supplied parts of Southeast Asia. But here's the bitter twist — much of India's surplus was shipped out raw, and the value-added processing often happened abroad.

Even more ironic was the import scene: India, the land where the sacred cow had been revered for millennia, where Krishna himself was celebrated as Makhan Chor (butter thief), was importing milk powder and condensed milk from New Zealand, Denmark, and even Britain itself. This dependency was not due to a lack of cows, buffaloes, or milk — it was due to a broken supply chain, absence of cooperative structures, and an economy designed to drain, not develop, local industries.

The farmers of Anand eventually organized themselves and milk strike in 1946, which eventually resulted in the establishment of Amul as a cooperative dairy. The formation of Amul brought about a significant change in the dairy industry, empowering farmers and ensuring fair prices for their milk. Amul's success in revolutionizing the dairy industry in India inspired the formation of other cooperative dairies across the country, leading to increased self-sufficiency and economic growth. Today, Amul is a globally recognized brand known for its quality dairy products and sustainable business model.

By the eve of independence, India's dairy sector was like a well-fed cow whose milk was flowing — but into someone else's bucket. The stage was set for a post-1947 awakening, where the slogan would shift from Empire's Dairy to Swaraj ka Swadudh.

Turning a White Dream Into Reality

After the milk strike called by the Anand Dairy Farmers, the government has agreed to meet with representatives to discuss their demands for fair pricing and better working conditions. The strike has garnered widespread support from consumers who are also calling for transparency in the dairy industry. Thiribhuvandas Patel raised this problem and met with Sardar Vallabhai Patel to talk about the condition of dairy farmers in Anand. Then, Sardar



Vallabhbhai Patel, the Iron Man of India, gave the idea of the Dairy Co-operative Sector in India. Through this idea, cooperative societies achieve a monopoly over their milk production. This eventually led to the formation of the Kaira District Co-operative Milk Producers' Union Limited, which later became Amul. The success of this cooperative model revolutionized the dairy industry in India and empowered farmers to have more control over their livelihoods. He appointed Morarji Desai as the pacemaker for this project. Khaira District Co-operative Milk producers Union Limited was established in December 1946. Deputy Prime Minister of independent India Vallabhai Patel instructed the Cooperative union to share British government cheese factories and convert them into a dairy plant with NDRI.



This collaboration led to the establishment of Amul in 1948, which went on to become one of the largest dairy cooperatives in the world. The vision and leadership of Vallabhbhai Patel and Morarji Desai played a crucial role in transforming the dairy industry and improving the lives of farmers in India. The Anand Dairy Plant was established in 1948, but by the 1950s, it was struggling with outdated machinery. When Dr. Varghese Kurian arrived in Anand, a new era in the dairy sector began. He had been deputed to the National Dairy Research Institute in Anand. At that time, the Khaira District Co-Operative Union was facing significant difficulties due to obsolete equipment. When they heard about Kurian, they contacted Kurian, an engineer who graduated from abroad, so he was willing to help them. Still, when he observed that it became a routine, he instructed them to purchase a new machine. Tribhuvandas requested Dr Kurian to help them in suggesting and ordering a machine. Varghese Kurian was fed up with his job in NDRI since he resigned from there. When Tribhuvandas came to know about that, he requested Varghese Kurian to stay in Anand until all members learned how to control new machines. In 1950 Kurian joined as a General Manager of the Khaira District Co-Operative Milk Producer Union. Kurian's expertise and innovative approach revolutionized the dairy industry. Under his leadership, Amul became a symbol of India's White Revolution, significantly improving the economic conditions of farmers across the country. Khaira's dairy industry was growing steadily. The government recognized the contribution of Kurian and sent him to New Zealand and Australia under the fellowship of the Colombia Programme from October 1952 to April 1953. He mastered milk powder production techniques and cooperative dairy farming systems. When he returns to Anand, he put forward the project of establishing a modern dairy in front of Tribhuvandas Patel. In 1956, Kurian discovered how to manufacture milk powder from buffalo milk. On October 31, 1964, Lal Bahadur Shastri Visited Anand for the inauguration to learn about this cooperative's success. He spent a whole night with farmers in a village, even had dinner with the farmer to discuss his wish with Mr Varghese Kurian, then the general manager of Khaira District Co-operative Milk Producers Union Ltd (AMUL), to replicate this model in the other parts of the country for improving the socioeconomic conditions of farmers. As a result of this visit, the National Dairy Development Board (NDDB) was established at Anand in 1965,



and by 1970, it launched the Dairy Development Programme for India, which is popularly known as Operational Flood. This initiative led to a significant increase in milk production and helped millions of dairy farmers across the country improve their livelihoods. The success of this cooperative model inspired similar initiatives in other sectors, contributing to the overall development of rural India.



Operation Flood: The Milky Miracle That Changed a Nation

Post-independence, India's dairy sector faced a paradox — the largest cattle population in the world but an acute shortage of milk. This was due to the lack of organized dairy farming and modern processing techniques. The government implemented Operation Flood in 1970, which revolutionized the dairy industry by increasing milk production and creating a national milk grid. Dr. Verghese Kurien and the National Dairy Development Board (NDDB), whose vision transformed dairy from a scattered, low-yield activity into the world's largest milk production system. The NDDB in 1969 designed a Dairy Development Programmed to lay the foundation for a viable, Self-supportive National Dairy Industry. The operational flood came in the face of increasing milk production throughout India. The programme endeavors to link rural milk production to urban milk marketing through these cooperatives. It was an economic revolution, through the cooperative model championed by Amul, small farmers pooled their milk, gained bargaining power, and accessed modern chilling, testing, and processing facilities. By the late 1990s, India had moved from milk-deficient to milk-surplus, earning the title "The World's Largest Milk Producer." After many hurdles and struggles, the most crucial program to increase the surplus production of milk was launched with technical assistance from the United Nations Development Program (UNDP). The Food and Agriculture Organization (FAO) in July 1970, was called Operation Flood (OF); the Operation Flood program led to the White Revolution. Dr Varghese Kurian was the architect of the operation flood program. At the time of the operation flood, Dr Varghese Kurian was the founder chairman of NDDB, and Tribhuvandas Patel was the chairman at Amul. Dr Kurian gave all his efforts and required thrust through his professional management skills. His Gujrat experiment blossomed soon into a much larger operational flood, which spread over about 23 States, 180 Districts and 90,000 Village cooperatives. It changed India from an importer to the world's largest producer and exporter of milk. The Operation Flood program was implemented in three phases:

Phase I

The period of this phase was 1970-1979. In this phase, OF linked 18 milk sheds with consumers in major metropolitan cities of India. i.e., Delhi, Mumbai, Kolkata, Chennai. During this phase, mother dairies were established in four metros. The major work in this phase was that; to speed up the development of dairy cattle, intending to increase production and procurement.



Phase II

The duration of this phase was five years, from 1981 to 1985. During this time, milk sheds were increased to 136, and about 300 urban markets expanded the outlets for milk. In this phase the capacity of milk production was increased day by day.



Phase III

This phase was the most prolonged phase of the operational flood program from 1985 to 1996. This phase was the most crucial of this program. Many important decisions and policies were launched to expand and strengthen the dairy cooperatives to build the infrastructure necessary to procure and market the increasing volume of milk. In this period, Animal health care programmes, feed and Artificial Insemination services for cooperative members were introduced. Phase III of the operation Flood program gave the dairy farmers many benefits, developments, and employment.

New White Revolution

As we know, the White revolution increased the production of milk. It is known as the "Billion Litre Idea", which Dr Kurian conceived. White Revolution didn't make India self-sufficient in milk production, but on the other hand, it also developed into the most significant rural employment provider. At this time, about 12 million farmers started earning their income from dairy farming. When the program operation flood gets lots of success in the entire country. Then why do we need another revolution named as New White Revolution?

The New White Revolution comes in the context of increasing supply management hurdles due to the fact that milk production has outstripped population growth in India. After the operation flood, milk production increased rapidly, and the per capita consumption also increased.

However, the need for a new White Revolution is felt for several reasons:

- There is a surplus production of milk which is challenging to manage without technical guidance,
- There is heavy adulteration in most of the milk available to consumers,
- The development of recognized Indian Breeds has mainly been neglected so far
- These reasons led to a rise in consumers' demand for organic and natural milk products instead of milk from animals that are injected with growth hormones for more milk production are full of antibiotics

The main aim of the New White Revolution is mentioned below:

Use of AI Techniques

- AI tagging is essential for keeping track of cattle's health; it also benefits access to the loan liabilities or is used for insurance purposes.
- Generating income through quality cattle manure by changing traditional methods
- Dung can be processed into high quality manure with excellent market value, which boosts the farmer's income. Waste from farms is also used as a good source of fertilizer for our fields.



More focus on organic dairy products

For making organic dairy products, we have to change the feeding habits of our animals; we have to use 100% organic ration for our cattle, which can help the production of organic dairy products rather than it can also benefit the health of our cattle.

We talk a lot about The New White Revolution but is it working? Now, where can we feel its presence? Rashtriya Gokul Mission, Animal Husbandry Infrastructure Development Fund and GOBAR-DHAN are some government initiatives that can help usher in the New White Revolution.

Science Meets Tradition: The New Dairy Frontier

Fast forward to today, and dairy science is moving into realms that our ancestors could scarcely imagine. A new U.S. study from the University of Nevada, Reno, has added a twist to the modern dairy story: not all milk proteins are created equal — even if they look and taste the same.

Researchers compared traditional cow whey protein with a yeast-fermented “synthetic” whey that biotech start-ups claim to be identical. The findings?

Protein Variety Matters – Cow whey contained a mix of proteins like β -lactoglobulin, α -lactalbumin, and casein, while the synthetic version was nearly 98% β -lactoglobulin with little diversity.

Microbial Impact Differs – In lab simulations of the human gut, cow whey supported a richer diversity of gut bacteria than its synthetic counterpart.

Sugar Decorations Change the Game – Naturally occurring milk proteins carry unique sugar structures (N-glycans) that influence digestion and microbial interaction. The yeast version had fewer and structurally different glycans.

As Dr. Steven Frese, lead author of the study, notes: “Functionally, they behave like whey and taste like whey. But at the molecular level, they are decorated differently — and that changes how our gut microbes respond.”

Sustainability vs. Biological Complexity

Fermentation-based dairy wins on environmental metrics — using less land, water, and feed, and eliminating the need for antibiotics. But this research raises important questions about whether “identical” proteins truly deliver the same nutritional and microbiome benefits.

Industry veterans like R.S. Sodhi remind us that while innovation is key, “technology should complement, not replace, nature’s perfection.” The conversation is no longer just about producing milk — it’s about producing the right kind of milk for human health and planetary well-being.



From Swaraj to Swaduh: The Road Ahead

India's dairy journey is a living example of resilience — from the sacred cows of Vedic rituals, through colonial exploitation, to the white revolution, and now into the biotech era. As we step into a future of precision fermentation and lab-designed dairy, one truth stands tall: the value of milk lies not just in its taste or yield, but in its intricate relationship with human health, culture, and environment.

Whether from a village cow or a stainless-steel fermenter, the milk we drink carries the legacy of centuries — and the responsibility to nourish both people and planet.



Let's stop the misinformation and sip smart!

Think milk increases
the risk of
diabetes?

Think Again!
Dairy products like plain milk (GI 21) and Curd (GI 17) have a very low glycemic index, making them safe for diabetics. They do not spike blood sugar and may even support better metabolic health.





Non-Veg Milk”? The US-India Dairy Dilemma Explained

– Abhay Kumar Dubey

Imagine offering a glass of milk during a puja—milk that originated from a cow fed with pig blood, poultry droppings, or even rendered pet meat. Sound unsettling? That’s precisely why India has drawn a hard line on dairy imports from the United States.

As the US-India trade negotiations inch closer to a deal, “non-veg milk” has emerged as a surprisingly complex sticking point. But what exactly is this term, and why does it matter so much?



What Is “Non-Veg Milk”?

It may sound like an oxymoron, especially to Indian ears. In our culture, milk is sacred—used in fasts, temple rituals, and Ayurvedic healing. But the term “non-veg milk” has come into circulation to describe milk from cows fed with animal-based products, such as:

- Meat and bone meal
- Blood meal from pigs and horses
- Chicken feathers and droppings
- Tallow (rendered cattle fat)
- Even by-products from cats and dogs in some cases

In the US, such feed practices are not only legal but also standard for boosting protein intake and milk yields. However, India, with 38% of its population identifying as vegetarians, sees this as a cultural and ethical red flag.

“Imagine eating butter made from milk of a cow that was fed blood and meat. India may never allow that,” — Ajay Srivastava, GTRI (Global Trade Research Initiative)

India’s Demand: A Cultural & Ethical Certification

India has made it non-negotiable: All dairy imports must be certified that the animals were never fed with:

- Meat meal
- Bone meal
- Blood or tissues from ruminants or pigs

Only plant-based feed is acceptable. This certification is key to maintaining India’s religious and cultural fabric, where milk is both nourishment and a symbol of purity.



Beyond Culture: It's About Livelihood Too

India isn't just rejecting US milk on moral grounds—it's also about protecting the livelihood of over 70 million small dairy farmers. Most own 1–3 cows and depend on milk sales for daily income.

Potential impact if the dairy sector opens up:

- Domestic prices could fall by 15%
- Annual loss to Indian farmers: ₹1.03 lakh crore
- The sector contributing 3% to India's GVA could be severely disrupted

It's not just about milk—it's about millions of livelihoods.

The Core Issue: Feed Philosophy

Let's break it down:

India	USA
Grass, grain, oil cakes	Meat meal, blood meal, tallow
Traditional, lower yield	High-protein, high-yield
Aligns with vegetarian beliefs	Prioritizes efficiency
Cultural purity = value	Industrial productivity = value

Global Practices: Are We the Outliers?

India is not alone in valuing cow purity. But in contrast:

- Europe, USA, Mexico, Brazil, Japan, Australia: commonly use animal-based cattle feed
- India: cows are largely fed green/dry fodder, grains, bran
- Few Indian corporate farms: are experimenting, but no meat-based feed is mainstream

Is Non-Veg Milk Dangerous to Health?

Interestingly, studies suggest that non-veg-fed cow milk is nutritionally safe. No direct harm has been reported in humans consuming it.

But for India, the issue is not safety alone—it's about values, trust, and tradition. Milk here isn't just a food; it's a cultural symbol.



Final Thought: Is a Middle Ground Possible?

India and the US aim for \$500 billion in bilateral trade by 2030. But dairy remains the biggest roadblock.

India's position?

- No compromise on culture
- No imports unless cows are plant-fed
- Protect domestic farmers and consumers

"Efficiency matters. But so does empathy—towards culture, belief, and people."

— Dairy Planet Editorial

Your Turn: Let's Discuss!

1. Should India stick to its stance on "non-veg milk"?
2. Can the US adopt a separate certification for Indian markets?

By integrating scientific principles with cultural sensitivity, ethical trade can create a more just and sustainable global marketplace, benefiting both producers and consumers while preserving the richness and diversity of human cultures.

Is there a path for ethical trade that honors both science and culture?





Cold Chain Logistics in Dairy Industry: The Chilling Backbone of Freshness

– Shubham Shandilya

In the dairy world, freshness isn't just a selling point — it's the very promise every milk carton, yogurt cup, and block of cheese makes to the consumer. But keeping that promise requires more than just good cows and clean processing plants. It needs a silent, invisible hero: Cold Chain Logistics.

Why the Cold Chain Matters in Dairy

Milk and milk products are nature's nutrient powerhouses — rich in proteins, fats, vitamins, and minerals. Unfortunately, the same nutrition that makes dairy valuable also makes it highly perishable. At ambient temperatures, microbial growth can spoil milk within hours. This is where the cold chain steps in — a carefully maintained series of temperature-controlled steps from farm to consumer, ensuring product safety, quality, and shelf life.

The Science Behind Chilling

According to milk chemistry principles, the primary aim of refrigeration is to slow down enzymatic and microbial activity. Most spoilage bacteria in milk thrive between 20 and 40 °C. Cooling raw milk to 4 °C or below immediately after milking drastically reduces bacterial growth rates, buying precious time for processing and distribution.

Temperature isn't just a number here — it's a biological speed limit for spoilage.

- At 4 °C: Bacterial growth is minimal; product stays fresh for 2–5 days.
- At –18 °C (frozen dairy): Microbial activity is virtually halted, enabling months of safe storage.

Key Stages of the Dairy Cold Chain

1. On-Farm Cooling: Milk is chilled within 2 hours of milking using Bulk Milk Coolers (BMCs).
2. Chilled Transportation: Insulated milk tankers with temperature monitoring systems move milk to processing plants.
3. Processing & Packaging: Pasteurization, UHT treatment, or fermentation ensures microbial safety, followed by packaging under hygienic conditions.
4. Cold Storage: Finished products are stored in cold rooms at precise temperatures (e.g., 0–4 °C for fresh milk, –18 °C for ice cream).
5. Refrigerated Distribution: Delivery vehicles ensure uninterrupted temperature control to retailers.
6. Retail Display & Consumer Handling: The chain is only as strong as its last link — even at the retail outlets, temperature abuse can undo all upstream efforts.



Technology Driving the Cold Chain

Modern dairy cold chains are no longer just about ice and insulated boxes. They leverage:

- IoT-based temperature monitoring for real-time alerts.
- Data loggers for transport verification.
- Energy-efficient refrigeration systems to reduce operating costs.
- Automated cold storage for better inventory management.

Challenges in the Indian Dairy Cold Chain

Despite being the world's largest milk producer, India loses a significant portion of its dairy output due to cold chain gaps. Rural areas may lack reliable electricity, insulated transport is still limited in smaller towns, and last-mile refrigeration is often neglected.

The Way Forward

Investments in solar-powered BMCs, mobile chilling units, and AI-powered logistics planning are game-changers in progress. Integrating renewable energy with cold chain systems can also cut costs and make dairy logistics sustainable.

Final Word

Cold chain logistics is the unsung hero of the dairy industry—working silently behind the scenes to ensure that every dairy product retains its taste, texture, nutrition, and safety. In a market where consumers demand not just freshness but also traceability, the cold chain is no longer an operational choice—it is a strategic necessity.

The next time you pour fresh milk into your coffee or enjoy a creamy yogurt, remember—it's not just a product you're tasting, it's the success of a precisely engineered, temperature-controlled journey.





Milk Proteins Demystified: The Superpowers of Casein & Whey

– Vicky Kumari

Milk is far more than a refreshing drink — it's a marvel of natural engineering. At the heart of its nutritional and functional magic lie two protein powerhouses: casein and whey proteins. Together, they form the backbone of countless dairy products and play vital roles in human nutrition, food processing, and even medical applications. But what exactly makes them so unique? Let's break it down — scientifically, but in plain English.

1. The Protein Blueprint of Milk

Milk contains about 3.2–3.5% protein, which can be broadly divided into:

- Casein proteins – roughly 80% of total milk proteins
- Whey proteins – the remaining 20%

These two groups differ not only in structure but also in function, digestibility, and industrial significance.



2. Casein – The Structural Maestro

Structure & Nature

Caseins aren't just floating around in milk — they're organized into micelles: tiny spherical structures held together by calcium phosphate bridges. Imagine them as soft molecular "sponges" that trap water, minerals and nutrients.

Key Types of Caseins:

- α s1-casein – major contributor to micelle structure and gel firmness in cheese
- α s2-casein – rich in phosphorus, helping bind calcium
- β -casein – amphiphilic, giving it surface-active properties for emulsification
- κ -casein – the gatekeeper; stabilizes micelles and controls coagulation

Functional Roles:

- Cheesemaking: Rennet cleaves κ -casein, causing micelles to destabilize and form a gel.
- Nutrient Delivery: Micelles carry essential amino acids, calcium, and phosphate.
- Heat Stability: Casein is more resistant to heat compared to whey proteins.



3. Whey Proteins – The Nutritional Warriors

Structure & Nature

Whey proteins remain dissolved in milk serum after casein is removed. They are globular proteins, meaning they're tightly folded into specific 3D shapes — highly sensitive to heat and pH changes.

Major Whey Proteins:

- β -lactoglobulin (β -LG): Rich in sulfur-containing amino acids; excellent for gel and foam formation.
- α -lactalbumin (α -LA): Key in lactose synthesis in the mammary gland; high nutritional quality.
- Serum albumin: Binds fatty acids and vitamins.
- Immunoglobulins: Boost immunity, especially in colostrum.
- Lactoferrin: Iron-binding glycoprotein with antimicrobial effects.

Functional Roles:

- Nutrition: High biological value; supports muscle repair and growth.
- Heat Sensitivity: Denatures at high temperatures, which can improve digestibility but affect solubility.
- Medical & Infant Nutrition: Used in sports supplements, specialized diets, and infant formula.

4. Casein vs Whey – The Showdown

Feature	Casein	Whey Proteins
Proportion in Milk	~80%	~20%
Structure	Micellar, stable	Globular, soluble
Heat Stability	High	Low
Digestion Speed	Slow – sustained amino acid	Fast – rapid amino acid spike
Industrial Use	Cheese, yogurt, film-forming	Beverages, supplements,



5. Why This Matters to the Dairy Industry

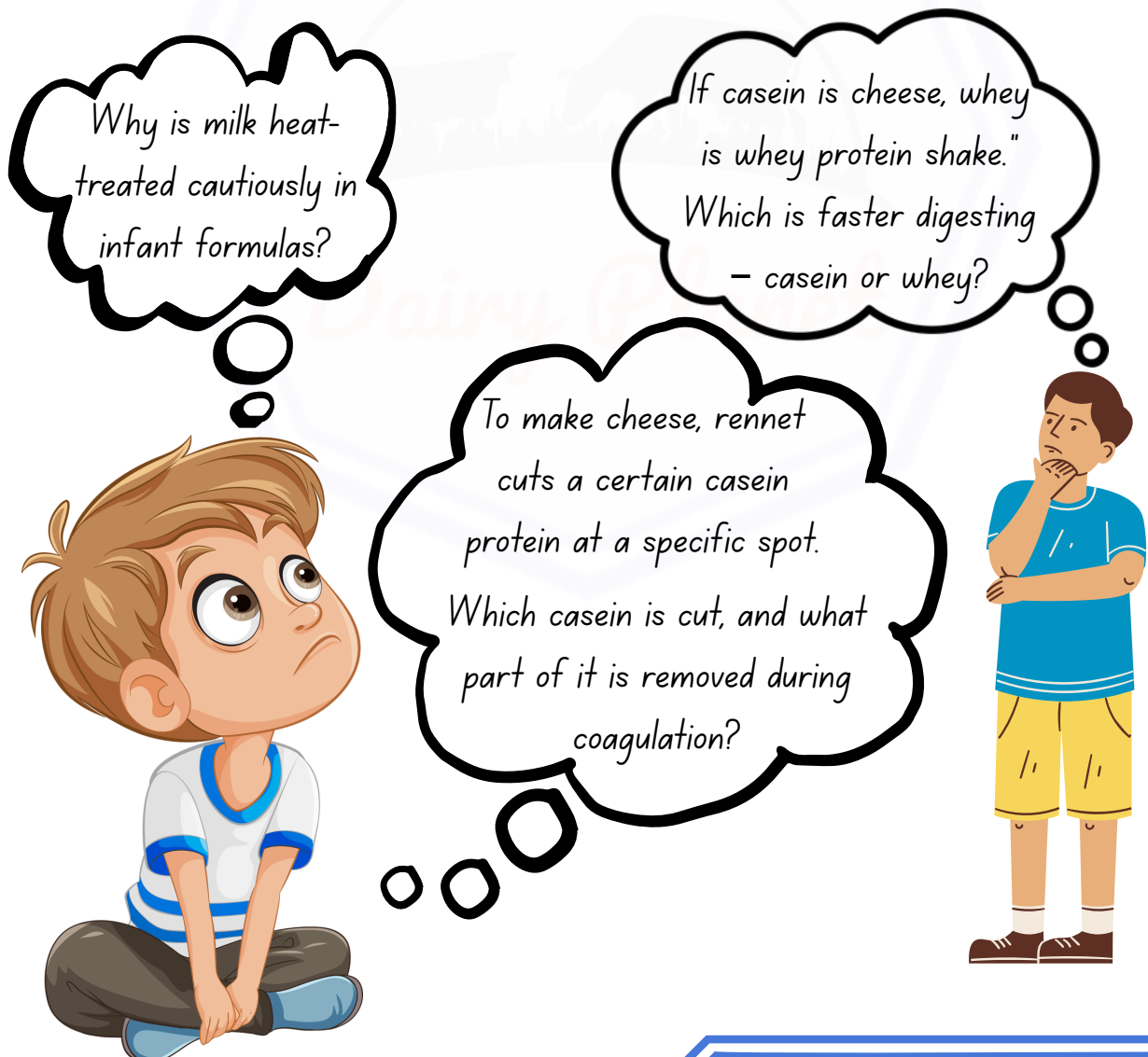
Understanding the distinct properties of casein and whey is critical for:

- Product Innovation: From high-protein yogurts to lactose-free sports drinks.
- Process Optimization: Controlling pH, temperature, and enzyme treatments to tailor texture and yield.
- Value Addition: Whey, once a waste product, is now a billion-dollar global ingredient.

6. The Takeaway

Casein and whey proteins aren't just nutrients — they're nature's precision tools for building textures, delivering nutrition, and enabling dairy's versatility. Whether you're crafting artisan cheese, designing infant formula, or developing protein-rich sports nutrition, knowing how these proteins work at the molecular level opens the door to endless possibilities.

In short, casein builds structure, whey delivers speed, and together, they make milk one of the most remarkable functional foods known to humankind.





The Chemistry of Ice Cream: Science Behind the Scoop

– Aman Kumar

When you dig your spoon into a creamy, velvety scoop of ice cream, you're not just enjoying a dessert—you're tasting the product of a finely tuned chemical orchestra. Ice cream isn't merely "frozen milk and sugar"; it's a sophisticated colloidal system, a frozen emulsion stabilized by proteins, fats, sugars, and air bubbles. Every silky bite is the result of carefully balanced food chemistry.

Milk – The Star Ingredient

At its heart, ice cream is a dairy-based emulsion. Milk fat provides richness, milk proteins (casein and whey) stabilize the emulsion, and lactose adds subtle sweetness. These components work together with non-dairy ingredients to create the structure and mouthfeel consumers crave.

- Fat globules: Coated by milk proteins and emulsifiers, they trap air bubbles and lend creaminess.
- Casein micelles: Help bind water and fat, preventing separation.
- Whey proteins: Enhance foam stability and improve texture.

The Science of Sweetness and Softness

Sugar does more than sweeten — it lowers the freezing point of the mixture, ensuring ice cream remains scoopable even at sub-zero storage temperatures. A perfectly balanced sugar profile prevents it from turning into a rock-solid ice block.

The Role of Air – Overrun

Ice cream's lightness comes from incorporated air, known as overrun. Without it, your dessert would be dense and icy. Industrial ice cream usually contains 30–100% overrun, depending on style. This air dispersal also plays a crucial role in sensory perception, making flavors more aromatic and textures more indulgent.

Freezing – Where Chemistry Meets Engineering

When the mix enters the continuous freezer, something magical happens:

- Rapid cooling causes small ice crystal formation — key for smoothness.
- Fat globules partially coalesce, trapping air and creating the desired structure.
- Stabilizers like guar gum or carrageenan bind water to control ice crystal growth during storage.
- A slow freeze would lead to large ice crystals and an unpleasant, gritty texture — the enemy of premium ice cream.



Emulsifiers – The Silent Architects

Ingredients like mono- and diglycerides or lecithin displace some milk proteins from fat globule surfaces, encouraging partial coalescence of fat during freezing. This strengthens the fat–air–ice network that gives ice cream its body.

Serving Temperature – The Final Touch

Even after perfect formulation, storage and serving temperatures determine how the chemistry translates into consumer experience. Ideal serving is around -12°C to -14°C — cold enough to hold structure, warm enough for flavor release.

Why It Melts the Way It Does

Melting isn't simply "ice turning to water." It's a controlled collapse of the fat–air–ice matrix. Well-formulated ice cream melts uniformly, holding shape longer before succumbing to gravity. Poor formulations, on the other hand, collapse into puddles quickly, revealing weak structural chemistry.

Conclusion

Ice cream is a marvel of dairy science — a frozen emulsion with microstructure engineering, protein chemistry, and thermodynamics all playing lead roles. Next time you enjoy a scoop, remember: it's not just dessert; it's a masterclass in applied dairy chemistry.





Health benefits of fermented foods: Microbiota and beyond

– Abhishek Kumar

Introduction

Fermented foods and beverages are staples of the human diet and have been produced and consumed since the development of human civilizations. Fermented foods are generally defined as those foods or beverages made through controlled microbial growth and enzymatic conversions of major and minor food components. Food fermentation processes can be categorized by the primary metabolites and microorganisms involved: alcohol and carbon dioxide (yeast), acetic acid (Acetobacter), lactic acid (lactic acid bacteria (LAB) belonging to genera such as *Leuconostoc*, *Lactobacillus*, and *Streptococcus*), propionic acid (*Propionibacterium freudenrichii*), and ammonia and fatty acids (*Bacillus*, molds).

Fermented foods and beverages were among the first processed food products consumed by humans. The production of foods such as yogurt and cultured milk, wine and beer, sauerkraut, kimchi, and fermented sausage was initially valued because of their improved shelf life, safety, and organoleptic properties. It is increasingly understood that fermented foods can also have enhanced nutritional and functional properties due to the transformation of substrates and the formation of bioactive or bioavailable end-products. Many fermented foods also contain living microorganisms, some of which are genetically similar to probiotic strains.

Benefits of fermented foods

Fermentation can be viewed as a biological method of food preservation. Foods produced in this way have a reduced risk of contamination when enriched in antimicrobial end-products, such as organic acids, ethanol, and bacteriocins. Fermented foods' advantages include new and desirable tastes and textures that are entirely unlike those in the starting materials. Other benefits are more specific to the particular food type. It also improves our gut health upon consumption.

Probiotic features of fermented food microorganisms

Many species found in fermented foods are identical to or share physiological traits with species that promote GI tract health. The importance of this was recently demonstrated by a study in which cheeses were produced using starter culture strains (*L. delbrueckii* subsp. *lactis* CNRZ327 and *P. freudenrichii* ITG) that had been selected based on their in vitro anti-inflammatory potential.



Delivery of commensal microbes to the GI tract

Many fermented food and beverage products are processed so that viable microorganisms are absent during consumption. Nonetheless, some of the most familiar fermented foods, including sauerkraut, kimchi, kefir, dry fermented sausage, yogurt, cheese, kombucha, and miso, ordinarily contain viable cells in notable quantities ranging between 10^6 and 10^9 cells/g or cells/ml. A relatively large fraction of those microbes survive through the human digestive tract.

Transformation of food constituents

During fermentation, the raw material's enzymatic activity and the microorganisms' metabolic activity can change the nutritive and bioactive properties of food matrices in a manner that has beneficial consequences for human health. For example, most cheeses are typically well-tolerated by lactose-intolerant individuals because some of the lactose in the milk is fermented, and the remaining lactose is separated into the whey fraction during cheese production.



Real vs Fake Paneer: Identification, Quality Tests, and Health Concerns

– Dairy Planet Editorial Team

Paneer, also known as Indian cottage cheese, is a staple dairy product in South Asian cuisine. It is prized for its mild flavour, high-quality milk proteins, and versatility in culinary applications. However, increasing consumer demand has led to a rise in adulterated or analogue paneer in the market. This article outlines the composition, sensory characteristics, detection methods, and health implications of real versus fake paneer, drawing on standard dairy technology references and quality control guidelines.

Real Paneer

Primary Ingredient:

- Pure cow or buffalo milk.
- Coagulants Used: Food-grade acids such as lemon juice (citric acid), vinegar (acetic acid), or sour whey (lactic acid fermentation).

Manufacturing Process:

- Milk is heated to about 85–90°C, followed by the addition of the coagulant.
- Coagulum is separated from whey, pressed, and cooled to obtain a soft, cohesive block.

Sensory Profile:

- Texture: Soft, slightly moist, and spongy.
- Taste: Mild, fresh, and milky with a light creaminess.



Fake or Analogue Paneer

Primary Ingredients:

- Synthetic milk (water + urea + detergent).
- Vegetable oils and hydrogenated fats.
- Starch (potato, corn, tapioca).
- Artificial whiteners and emulsifiers.

Manufacturing Objective: Mimic the appearance and firmness of paneer while reducing production cost.

Sensory Profile:

- Texture: Rubbery, overly chewy, or unnaturally smooth.
- Taste: Bland, bitter, chemical-like, or with a soapy aftertaste.



Practical Tests for Differentiating Real and Fake Paneer

Dairy technologists and food inspectors rely on simple laboratory or household tests to identify adulterants in paneer.

A. Iodine Test (for Starch Adulteration)

Procedure:

- Boil a small paneer piece for 2–3 minutes and cool.
- Add 2–3 drops of iodine solution.

Observation:

- Blue/black coloration → presence of starch (adulteration).
- No colour change → absence of starch (pure paneer).

B. Texture & Press Test

Procedure: Press a small piece between fingers.

Observation:

- Real paneer → Soft, moist, crumbles easily.
- Fake paneer → Rubber-like, springs back.

C. Boiling/Hot Water Test

Procedure: Immerse a small piece in boiling water for 5–10 minutes.

Observation:

- Real paneer → Softens and retains shape.
- Fake paneer → Becomes hard/rubbery or slimy.

D. Arhar Dal Test (Urea/Detergent Detection)

Procedure: Boil paneer, cool, then add a few grams of pigeon pea (*Cajanus cajan*).

Observation: Light red water after ~10 minutes → likely urea or detergent present.

E. Soybean Powder Test (Urea/Detergent Detection)

Procedure: Boil paneer, cool, add soybean powder.

Observation: Red coloration → adulteration with urea/detergent.

F. Lemon Juice Test

Procedure: Crush a piece of paneer, mix with lemon juice/vinegar.

Observation:

- Real paneer → Slight disintegration.
- Fake paneer → Remains intact (due to non-milk solids).



Health Implications of Consuming Fake Paneer

The adulterants used in fake paneer pose serious short-term and long-term health risks:

- Urea: Kidney strain, metabolic disturbances.
- Detergents: Gastrointestinal irritation, damage to mucosal lining.
- Synthetic Milk Chemicals: Liver toxicity, potential carcinogenic effects.
- Excess Starch: Alters nutritional profile, causes digestive discomfort.

According to FSSAI standards for paneer, the product must be prepared exclusively from milk solids with minimum 50% moisture and at least 50% milk fat (on dry matter basis). Adulterated paneer fails to meet these legal definitions and can be prosecuted under the Food Safety and Standards Act.

Consumer Advice & Prevention

Check Labels: Ensure FSSAI license number, manufacturing details, and nutritional declaration are present.

- Price Awareness: Extremely low-priced paneer is a red flag for possible adulteration.
- Source Selection: Purchase from reputable brands and verified dairy outlets.
- Sensory Evaluation: Perform basic texture and odour checks before consumption.

Conclusion

Paneer quality is a critical aspect of food safety in the dairy sector. While traditional paneer provides wholesome nutrition and culinary value, fake or analogue paneer compromises both health and product integrity. By using simple detection tests, following FSSAI standards, and sourcing from trusted suppliers, consumers and regulatory bodies can help curb the spread of adulterated dairy products.





Cow's Milk vs. Fermented Dairy Proteins – Same Sip, Different Science?

– Dairy Planet Editorial Team

The dairy aisle is evolving. Alongside cartons of fresh milk and tubs of yogurt, sleek new labels promise “animal-free” whey and “fermentation-powered” dairy products. These innovations are being hailed as sustainable game-changers, cutting out cows entirely and replacing them with precision fermentation – essentially, yeast engineered to act like miniature protein factories.

On paper, these proteins are marketed as identical to those in cow's milk. But a recent study from the University of Nevada, Reno, has revealed that while they may look and taste like whey, they aren't identical when you zoom in to the molecular level – and those subtle differences could matter for both gut health and nutrition.

The Molecular Makeover of Whey

In the lab, researchers compared two types of whey protein:

1. Traditional cow's milk whey – the familiar by-product of cheese-making.
2. Yeast-derived whey – created through precision fermentation without a single cow involved.

Using advanced protein analysis, the team confirmed that both were built primarily from β -lactoglobulin – the major protein in whey. But here's the twist:

- Cow's milk whey contained a broader protein portfolio, including α -lactalbumin, serum albumin, and fragments of casein.
- Yeast-derived whey was almost a single-player game – 98% β -lactoglobulin with very little diversity in supporting proteins.

Why does this matter? In nature, protein diversity isn't just about nutrition – it's also about how those proteins interact with the body, the microbiome, and even the immune system.

Sugar Coats with a Purpose

Proteins in milk don't float around naked – they carry sugar molecules known as N-glycans. These microscopic “decorations” influence how proteins fold, interact with bacteria, and are absorbed by the gut.

The Nevada-led study found:

- Cow's milk whey had more complex and varied glycan patterns.
- Fermentation-based whey had fewer glycans, and the structures themselves were different.

These changes could subtly affect digestion and microbial interactions – like swapping out the trim on a key and expecting it to fit the same lock.



When Proteins Meet the Microbiome

The real test was to see how these proteins influenced gut bacteria. Using a lab-based “mini-gut” fermentation model, researchers introduced each whey type into simulated human microbiomes.

The results were clear:

- Cow’s milk whey encouraged a broader diversity of gut microbes, including strains associated with digestive health.
- Yeast-derived whey produced less microbial diversity – though researchers stressed that “less” does not automatically mean “worse,” as microbiome effects can be highly individual.

This finding matters because gut microbial diversity is often linked to resilience, immunity, and metabolic health.

Why This Study Matters for the Dairy Future

Fermentation-derived dairy proteins are undeniably sustainable – no cows means lower methane emissions, drastically reduced water and land use, and no need for hormones or antibiotics. But the “identical to milk” claim now comes with an asterisk: functionally similar doesn’t necessarily mean biologically identical.

For nutrition scientists, the message is clear – new proteins need to be studied for how they behave inside the body, not just how they behave in the factory or on the tongue.

As lead researcher, Dr. Steven Frese put it:

“It’s not about declaring one better. It’s about understanding whether they are truly interchangeable once consumed. That’s the conversation the food industry needs to have.”

The Bottom Line for Consumers & Industry

- For consumers: Don’t panic – fermentation-based whey is still a high-quality protein source. But if you’re consuming it for gut health benefits similar to traditional dairy, the jury is still out.
- For industry: Precision fermentation is a breakthrough technology, but protein diversity and glycan profiles may need to be tuned if the goal is to replicate cow’s milk at the biological level fully.
- For researchers: Studies like this serves as a roadmap for ensuring that novel foods match their claims – and for exploring whether some differences might even be beneficial.

In short, the glass of whey protein you drink tomorrow might come from a cow, a vat of yeast, or something else entirely. But thanks to science, we’re learning that where your protein comes from could shape more than just its carbon footprint – it might shape your microbiome too.



दूध एवं बार्नयार्ड मिलेट (Echinochloa frumentacea) का संयोजन: पारंपरिक ज्ञान से आधुनिक पोषण विज्ञान तक

— अमित कुमार शुक्ल

सारांश

दूध और बार्नयार्ड मिलेट (सांवा) का संयोजन भारतीय खाद्य संस्कृति और आधुनिक पोषण विज्ञान का अद्वितीय संगम है। यह मिश्रण न केवल उच्च गुणवत्ता वाले प्रोटीन और आवश्यक अमीनो अम्ल प्रदान करता है, बल्कि इसमें प्रचुर मात्रा में फाइबरयुक्त आहार (Dietary Fiber), सूक्ष्म पोषक तत्व (Iron, Zinc, Calcium, Phosphorus) और जैव सक्रिय यौगिक (Bioactive Compounds) भी मौजूद हैं। वैज्ञानिक अध्ययनों से सिद्ध हुआ है कि यह संयोजन रक्त शर्करा नियंत्रण, हड्डियों और मांसपेशियों के स्वास्थ्य में सुधार, रक्ताल्पता की रोकथाम और आंतों के सूक्ष्मजीव समुदाय के संतुलन में महत्वपूर्ण भूमिका निभाता है। यह लेख दूध-मिलेट संयोजन की रासायनिक संरचना, जैव सक्रिय गुण, कार्यविधि, शोध प्रमाण, व्यावहारिक अनुप्रयोग और सार्वजनिक स्वास्थ्य में संभावित योगदान पर विस्तृत समीक्षा प्रस्तुत करता है।

परिचय

भारत में दूध और मोटा अनाज (Millets) का सह-उपयोग हजारों वर्षों से प्रचलित है। दूध को प्राचीनकाल से ही 'पूर्ण आहार' माना गया है, क्योंकि इसमें सभी आवश्यक अमीनो अम्ल, उच्च जैव-उपलब्धता वाला कैल्शियम, फॉस्फोरस, और विटामिन A, D, B2, B12 प्रचुर मात्रा में पाए जाते हैं। बार्नयार्ड मिलेट (*Echinochloa frumentacea*), जिसे सांवा या 'व्रत का चावल' भी कहा जाता है, भारत के पर्वतीय और शुष्क क्षेत्रों में व्यापक रूप से उगाया जाता है। यह ग्लूटेन-फ्री, उच्च फाइबर युक्त और खनिजों से भरपूर लघु अनाज है, जो कम ग्लाइसेमिक इंडेक्स के कारण मधुमेह रोगियों के लिए भी उपयुक्त है। संयुक्त राष्ट्र ने वर्ष 2023 को 'अंतर्राष्ट्रीय मिलेट वर्ष' (International Year of Millets) घोषित किया, जिससे मिलेट के पोषण और आर्थिक महत्व पर वैश्विक स्तर पर ध्यान आकर्षित हुआ। भारत सरकार भी मिलेट को राष्ट्रीय और अंतर्राष्ट्रीय स्तर पर बढ़ावा देने के लिए सक्रिय रूप से कार्य कर रही है।

मिलेट की कृषि एवं पर्यावरणीय विशेषताएं

मिलेट न केवल मानव आहार के लिए उपयुक्त है बल्कि यह पशुओं के चारे का भी एक उत्कृष्ट विकल्प हो सकता है। इसके पौधे की पत्तियाँ और भूसा उच्च पोषण वाले चारे के रूप में उपयोग किए जा सकते हैं। कृषि की दृष्टि से मिलेट की सबसे बड़ी विशेषता यह है कि इसे बदले हुए मौसम की हर परिस्थितियों में भी उगाया जा सकता है, जैसे कम पानी, बंजर भूमि और न्यूनतम या बिना रासायनिक खाद के प्रयोग के साथ भी इसकी पैदावार अच्छी होती है। यह विशेषता इसे जलवायु परिवर्तन के समय एक टिकाऊ फसल बनाती है।

अतीत में, भारतीय किसानों ने धीरे-धीरे मिलेट की खेती से दूरी बना ली थी। इसके पीछे मुख्य कारण थे:

- उच्च पैदावार देने वाली गेहूँ और धान की किस्मों का आगमन और सरकारी खरीद में उनकी प्राथमिकता।
- शहरी उपभोक्ताओं में मिलेट आधारित आहार की मांग का कम होना।
- प्रसंस्करण तकनीक और बाजार में मिलेट उत्पादों की सीमित उपलब्धता।
- किसानों को मिलेट के लिए न्यूनतम समर्थन मूल्य (MSP) और पर्याप्त विपणन सहायता का अभाव।

अब, जब भारत खाद्य उत्पादन के मामले में अग्रणी हो चुका है और पोषण सुरक्षा पर जोर दिया जा रहा है, तो मिलेट को पुनः बड़े पैमाने पर अपनाने का सही समय है। इससे न केवल किसानों की आय बढ़ेगी बल्कि मानव पोषण और पर्यावरणीय स्थिरता दोनों में सुधार होगा।



रासायनिक एवं पोषण संरचना

दूध और बार्नयार्ड मिलेट का संयोजन पोषण की दृष्टि से अत्यंत समृद्ध है, क्योंकि इसमें मानव शरीर के लिए आवश्यक मैक्रोन्यूट्रिएंट्स (Carbohydrate, Protein, Fat) के साथ-साथ माइक्रोन्यूट्रिएंट्स (Vitamins, Minerals) और बायोएक्टिव कम्पाउंड्स भी पर्याप्त मात्रा में पाए जाते हैं।

500 ml दूध + 100 g बार्नयार्ड मिलेट: पोषण प्रोफाइल Nutrition Facts (प्रति 100 g तैयार खीर, 3 सर्विंग्स में से 1)

पोषक तत्व	मात्रा
ऊर्जा	220-230 kcal
प्रोटीन	≈ 9.0 g
वसा	≈ 6-7 g
कार्बोहाइड्रेट	≈ 34-35 g
फाइबर	≈ 3.5-4 g
कैल्शियम	≈ 200 mg
फॉस्फोरस	≈ 160 mg
पोटैशियम	≈ 250 mg
मैग्नीशियम	≈ 20 mg
आयरन	≈ 1.6 mg
जिंक	≈ 1.8 mg
विटामिन B12	≈ 0.7 µg
विटामिन A	≈ 85-100 µg RAE
विटामिन D	≈ 1 µg
राइबोफ्लेविन (B2)	≈ 0.33 mg



Dairy Planet Digest



कुल मिश्रण (500 ml दूध + 100 g बार्नयार्ड मिलेट) – वैज्ञानिक पोषण सारणी

पोषक तत्व	मात्रा	स्वास्थ्य लाभ
ऊर्जा	~665 kcal	दीर्घकालिक ऊर्जा का स्रोत
प्रोटीन	27.6 g	मांसपेशियों की वृद्धि और मरम्मत
वसा	17–21 g	हृदय स्वास्थ्य और ऊर्जा
कार्बोहाइड्रेट	90–95 g	स्थिर ऊर्जा रिलीज़
आहार-रेशा	10–12 g	पाचन और कोलेस्ट्रॉल नियंत्रण
कैल्शियम	600 mg	हड्डियों और दाँतों की मजबूती
फॉस्फोरस	480 mg	कैल्शियम अवशोषण और हड्डी स्वास्थ्य
पोटैशियम	750 mg	रक्तचाप नियंत्रण
मैग्नीशियम	60 mg	ऊर्जा उत्पादन और मांसपेशी कार्य
आयरन	4.8–4.9 mg	हीमोग्लोबिन संश्लेषण
जिंक	5.4 mg	प्रतिरक्षा प्रणाली
विटामिन B12	2 µg	तंत्रिका और रक्त स्वास्थ्य
विटामिन A	250–300 µg RAE	दृष्टि और प्रतिरक्षा
विटामिन D	3 µg	कैल्शियम अवशोषण
राइबोफ्लेविन (B2)	1 mg	ऊर्जा मेटाबॉलिज्म
फाइटोकेमिकल्स	—	एंटीऑक्सीडेंट प्रभाव



भविष्य की संभावना

दूध-मिलेट संयोजन को राष्ट्रीय पोषण मिशन और पोषण अभियान में शामिल किया जा सकता है। RTE (रेडी टू इट) और RTC (रेडी टू कन्जुम) उत्पादों के रूप में इसका उत्पादन किसानों की आय बढ़ा सकता है। ग्लूटेन-फ्री और डायबिटिक-फ्रेंडली बाजारों में इसकी मांग बढ़ सकती है। स्कूल मिड-डे मील में सप्ताह में कम से कम एक दिन मिलेट आधारित व्यंजन शामिल करने की सिफारिश की जा सकती है, ताकि बच्चों को बचपन से ही इसके पोषण लाभ के बारे में जानकारी मिले और उनमें स्वास्थ्य के प्रति जागरूकता बढ़े। साथ ही, विशेष जागरूकता अभियानों, कार्यशालाओं और रसोई प्रशिक्षण कार्यक्रमों के माध्यम से आम जनता को भी मिलेट के लाभों से अवगत कराया जा सकता है। पशु चारा, जलवायु अनुकूल कृषि और पोषण सुरक्षा—इन तीनों में एक साथ योगदान देने के कारण मिलेट का महत्व आने वाले वर्षों में और अधिक बढ़ने की संभावना है।

निष्कर्ष

दूध और बार्नयार्ड मिलेट का संगम एक वैज्ञानिक रूप से प्रमाणित फंक्शनल फूड है, जो स्वाद, पोषण और स्वास्थ्य लाभ का संतुलन प्रदान करता है। यह कुपोषण उन्मूलन, सार्वजनिक स्वास्थ्य सुधार और सतत कृषि विकास में योगदान दे सकता है। सरकारी योजनाओं और जन-जागरूकता अभियानों के माध्यम से यदि इसे व्यापक रूप से अपनाया जाए, तो यह आने वाले समय में स्वास्थ्यवर्धक और आत्मनिर्भर भारत के निर्माण में अहम भूमिका निभा सकता है।

संकल्प

हर थाली में दूध और मिलेट का संगम, हर जीवन में पोषण और स्वास्थ्य का संगम – यही है स्वस्थ, सशक्त और आत्मनिर्भर भारत का मार्ग।





स्वराज से स्वावलंबन: भारतीय डेयरी की जागृति की वैज्ञानिक गाथा

— शुभम शांडिल्य

"अगर आप ध्यान से देखें, तो हर संकट में, एक अवसर छुपा होता है। मेरा विश्वास है कि उस अवसर को खोजकर पकड़ना चाहिए। मैं संकट से भागता नहीं — बल्कि जितना बड़ा संकट, उतनी तेज़ी से मैं उससे भिड़ता हूँ और उसे अपनी शर्तों पर मोड़ लेता हूँ।"

— डॉ. वर्गीज़ कुरियन

सुबह की शुरुआत... दूध के बिना अधूरी

आज की दुनिया में, लगभग हर व्यक्ति की सुबह एक कप चाय या कॉफी से शुरू होती है। बिना इसके, दिन जैसे चालू ही नहीं होता। ज़रा सोचिए — इस कप के पीछे कितनी अहमियत है दूध और उससे बने उत्पादों की। चाय, कॉफी, नाश्ते में सीरियल, ओट्स, स्मूदी — दूध हर जगह है, पोषण और स्वाद दोनों का आधार।

भारत का प्राचीन 'सुपरफूड'

दुनिया में "सुपरफूड" शब्द आने से बहुत पहले, भारत दूध, दही, घी और मक्खन के रूप में इसे जी रहा था। वैदिक काल में दूध सिर्फ भोजन नहीं था — यह स्वास्थ्य, आध्यात्मिकता और संस्कृति की मुद्रा था। आयुर्वेद में घी को 'अमृत' कहा गया है, जो पाचन, स्मरण शक्ति और ऊर्जा को बढ़ाता है। महाभारत में बाल कृष्ण का माखन चुराना सिर्फ एक शरारत नहीं, बल्कि समृद्धि और आनंद का प्रतीक था।

प्राचीन काल में डेयरी अर्थव्यवस्था मुनाफ़े या निर्यात के लिए नहीं, बल्कि समुदाय और परंपरा के लिए थी। हर घर अपनी छोटी डेयरी थी — शुद्ध दूध किसान से सीधे उपभोक्ता तक, बिना बिचौलियों, बिना प्रोसेसिंग प्लांट के जाता था।



औपनिवेशिक दौर: जब मलाई और मुनाफ़ा चला गया बाहर

1848 से 1947 तक, ब्रिटिश शासन ने भारत के लगभग हर क्षेत्र में हस्तक्षेप किया। डेयरी में यह हस्तक्षेप 1943 में हुआ, जब द्वितीय विश्व युद्ध के दौरान सेना के लिए दूध का बड़ा हिस्सा मोड़ दिया गया। गाँवों का दूध अब स्थानीय समुदाय के बजाय ब्रिटिश सेना, रेलवे और अफ़सरों के लिए जाने लगा।

इससे किसान दोहरी मार झेलने लगे — एक, दूध के दाम बेहद कम; दो, कोई ठंडा करने, स्टोर करने या प्रोसेसिंग की व्यवस्था नहीं। बिचौलियों ने किसानों का हक़ खा लिया।

खैर, इसी अन्याय से अमूल आंदोलन का अंकुर फूटा। 1946 में आनंद के किसानों ने हड़ताल की और कायरा जिला दुग्ध उत्पादक सहकारी संघ लिमिटेड बना — यही बाद में अमूल कहलाया और भारत के डेयरी इतिहास में क्रांति की नींव रखी।



स्वतंत्रता के बाद: 'सफ़ेद सपना' हकीक़त में

आनंद के किसानों की हड़ताल ने देश का ध्यान खींचा। सरदार पटेल ने सहकारी डेयरी मॉडल का सुझाव दिया और मोरारजी देसाई को इसकी ज़िम्मेदारी दी। 1948 में आनंद डेयरी प्लांट शुरू हुआ, लेकिन पुरानी मशीनों की दिक्कतें थीं। तभी आए डॉ. वर्गीज़ कुरियन — एक युवा इंजीनियर, जिन्होंने आधुनिक मशीनों से डेयरी को नई जान दी।

1956 में कुरियन ने भैंस के दूध से दूध पाउडर बनाने की तकनीक विकसित की — जो की एक गेमचेंजर साबित हुआ। 1964 में प्रधानमंत्री लाल बहादुर शास्त्री ने आनंद आकर स्वयं किसानों से मुलाकात की और यही सहकारी डेयरी मॉडल पूरे देश में फैलाने की योजना बनी।

ऑपरेशन फ़्लड: जिसने भारत को 'दूध घाटे' से 'दूध सरप्लस' में बदला

1970 में एन.डी.डी.बी. (डॉ. कुरियन के नेतृत्व में) ने ऑपरेशन फ़्लड शुरू किया। इसका मक़सद था — गाँव के दूध को सीधे शहर के बाज़ार से जोड़ना, सहकारी मॉडल से किसानों को ताज़क़त देना, और आधुनिक चिलिंग, टेस्टिंग और प्रोसेसिंग सुविधा उपलब्ध कराना।

तीन चरणों में यह कार्यक्रम चला और नतीजा — 1990 के दशक तक भारत दूध आयातक से दुनिया का सबसे बड़ा उत्पादक बन गया। इसे 'श्वेत क्रांति' कहा गया और यह 12 मिलियन ग्रामीण परिवारों की रोज़ी-रोटी का सबसे बड़ा साधन बना।

नई श्वेत क्रांति: अब गुणवत्ता और ऑर्गेनिक पर फोकस

आज दूध उत्पादन बढ़ चुका है, लेकिन चुनौतियाँ भी हैं — जैसे मिलावट, देसी नस्लों की अपेक्षा, और उपभोक्ताओं की ऑर्गेनिक उत्पादों की मांग। नई श्वेत क्रांति का उद्देश्य है:

- एआई तकनीकी से मवेशियों का स्वास्थ्य ट्रैक करना
- गोबर से ऑर्गेनिक खाद बनाकर अतिरिक्त आय पैदा करना
- 100% ऑर्गेनिक पशु-आहार देकर स्वस्थ और शुद्ध दूध

सरकार राष्ट्रीय गोकुल मिशन, पशुपालन अवसंरचना विकास निधि और गोबर-धन जैसी योजनाओं से इसे आगे बढ़ा रही है।

विज्ञान और परंपरा का संगम

आज बायोटेक कंपनियाँ लैब में "सिंथेटिक" दूध प्रोटीन बना रही हैं, जो पर्यावरण के लिए बेहतर हो सकता है, लेकिन शोध बताते हैं कि यह पारंपरिक गाय के दूध की तरह पोषण और माइक्रोबायोम लाभ नहीं देता। उद्योग के विशेषज्ञ याद दिलाते हैं — "तकनीकी प्रकृति का पूरक बने, विकल्प नहीं।"

भारतीय डेयरी क्षेत्र यह दर्शाता है कि परंपरा और तकनीक मिलकर सतत विकास का मार्ग प्रशस्त कर सकती हैं। भविष्य की रणनीतियों में जलवायु अनुकूल देशी नस्लों का संरक्षण, ऑर्गेनिक और नैतिक डेयरी खेती को बढ़ावा, पशु स्वास्थ्य और उत्पादन निगरानी के लिए एआई और IoT का प्रयोग, और कोल्ड चेन अवसंरचना का विस्तार शामिल होना चाहिए। श्वेत क्रांति से मिले सबक नीतिगत निर्णयों का आधार बनने चाहिए।

आगे का रास्ता

भारत की डेयरी कहानी — वेदों की पवित्र गाय से लेकर औपनिवेशिक शोषण, श्वेत क्रांति और अब बायोटेक युग — एक ज़िंदा मिसाल है कि कैसे परंपरा और नवाचार मिलकर किसी देश की तक्रदीर बदल सकते हैं। चाहे दूध गाँव की गाय से आए या लैब के स्टील टैंक से — उसमें सिर्फ स्वाद और पोषण ही नहीं, बल्कि सदियों की विरासत और भविष्य की ज़िम्मेदारी भी बहती है।



Future of Dairy Farming: 18 Groundbreaking Innovations to Watch at SPACE 2025

The 2025 edition of **SPACE** in Rennes, France, is set to showcase an exciting lineup of dairy sector breakthroughs. This year, **18 innovations** have been honoured with the prestigious **Innov'Space awards** – 3 receiving the coveted **2-star rating** and 15 earning **1 star**. These solutions promise to boost efficiency, animal welfare, sustainability, and farm profitability.

ManuRob: Loadix – Fully Autonomous Electric Handling Robot

Loadix handles bulk materials with 2 cm navigation accuracy using advanced sensors. Self-charging and tool-switching, it can also adapt to feed distribution and operate safely indoors or outdoors.

Heated Comfort for Calves – CalfCare Thermofloor (Bioret Agri)

Underfloor heating with hot-water circuits provides consistent warmth, reducing stress, disease, and bedding needs.

Supporting Cows Around Calving – Deltabolus FeedStim (Deltavit)

A slow-release bolus delivering plant-based flavonoids for 50 days to support udder health and boost milk yield by 3.3 L at peak lactation.

Rolland: Animotion 40 – Active Suspension with Lowering System

A first in the sector, this system combines active suspension with a hydraulic lowering chassis for smoother transport and enhance comfort for both humans and animals, at speeds up to 40 km/h (previously 25 km/h). It self-adjusts for load, improves braking, and reduces maintenance.

MSD Santé Animale: SenseHub Dairy YoungStock

A smart monitoring system for calves and heifers (birth to 12 months) that tracks activity, rumination, feeding, and suckling, issuing real-time health alerts via an ear tag with LED locator.

Mastitis Detection – Dipfit Smart CellSense (Bio-X Diagnostics)

A smartphone-based test strip system for detecting cathelicidins in milk, enabling earlier mastitis intervention.

Bucket Cleaning Innovation – EimiWash

Industrial-grade washing for feeding buckets using minimal water (1.5 L per bucket) and automatic detergent dosing.

AI Herd Assistant – Herdy (Pilot'Elevage)

Voice/text AI assistant for herd management, offering tailored recommendations and time savings.

Digital Rodent Control – HyCare DRC (Schippers France)

Digital Rodent Control – HyCare DRC (Schippers France)

Tank Level Alert – NivAlert (Ocene)

SMS alert system for low hydrogen peroxide levels in liner disinfection units.

Veterinary Teleconsulting – VetLinkPlatform (Adventiel)

5G-enabled platform for remote vet consultations, with data integration from farm sensors.

Smarter Milking – Flow-Responsive Milking (DeLaval)

Adjusts teat-end vacuum based on milk flow to save time and improve teat health.

Natural Pest Protection – Gerapyx (Arimosa SAS)

Plant-based pour-on repellent for lice, ticks, and disease-carrying flies, lasting up to 6 weeks.

Cubicle Maintenance – LiboX (Rosensteiner)

Three-step system for quick cubicle cleaning and re-bedding to improve animal comfort and milk yield.

Energy-Saving Fan Upgrade – Retrofit Kit (Abbi-Aerotech)

Replaces belt motors with direct-drive EC motors, cutting power use by up to 36%.

Eco-Friendly Feed – Turboviv'SE (CCPA Groupe)

Phytogenic supplement reducing methane emissions and improving feed efficiency.

From animal welfare tech to sustainability breakthroughs, the innovations at SPACE 2025 show a dairy industry embracing **automation, precision farming, and environmental responsibility**. These solutions don't just improve productivity – they promise healthier herds, greener farms, and stronger farmer resilience in the face of economic and climate challenges.

The background features a blurred image of electronic circuit boards, likely motherboards, with various components and connectors visible. Overlaid on this is a network diagram consisting of white dots connected by thin white lines, creating a web-like pattern across the top and bottom of the image. The overall color palette is a mix of light blue, white, and a warm orange-red gradient.

NEWS

UPDATE



Dairy World Roundup: Sustainability Milestones, Heat Stress Solutions, and Global Market Moves

From Alltech's climate gains to Friesland Campina's profit surge, here's what's shaping the dairy sector right now.

Utrix Marks 10 Years of Growth in the Middle East

Lebanon-based Utrix celebrated a decade since opening its manufacturing site on 18 June 2025. Starting in 2015 with its own premixes and specialties, Utrix is now the only GMP+ certified producer of premixes, concentrates, and feed additives in the Middle East, with growing export reach.

Volac Milk Replacers Strengthens GB Sales Team

Volac Milk Replacers has restructured to enhance its Feed for Growth platform in Central England and Wales:

- Ian Watson: Global Technical Manager + Head of 'Feed for Growth' business managers, overseeing formulation, NPD, and commercial ops.
- Fiona Moore: New Business Manager, with strong technical credentials in animal health and nutrition advisory roles.

Topcon Agriculture Unveils UC7 Plus Boom Height Control

Topcon Agriculture has rolled out the UC7 Plus — an upgrade to its boom height control tech — delivering better spray accuracy, reduced input costs, and improved crop performance, building on its NORAC technology foundation.

CCPA Targets Heat Stress in Dairy Herds

French group CCPA has launched Thermoplus Tarie, a heat stress solution tailored for dry cows, formulated without buffering agents. Its original Thermoplus product, when introduced 24 days pre-calving, is shown to boost lactation by 10%, improve fertility, and enhance animal comfort during hot conditions.

Alltech Raises the Bar on Sustainability

Alltech's 2024 Sustainability Report reveals double-digit business growth alongside a 7.8% cut in Scope 1 and 2 emissions (26% drop since 2021). Key actions include:

- US\$2.04m invested in energy projects, reducing 3,602 mt CO₂-e.
- Five zero-waste-to-landfill facilities and a new water stewardship strategy.
- 57 product life-cycle analyses completed and 799 research studies aligned with UN SDGs.

The company also confirmed full EUDR compliance and continues leading industry collaborations for resilient, deforestation-free food systems.

 **Join Us Today**

Fill out your registration here:

REGISTER NOW



Let's together make Dairy Planet the voice of the global dairy community!

Friesland Campina Delivers Strong H1 2025 Results

Dutch dairy giant FrieslandCampina reported:

- Operating profit: €363m
- Net profit: €230m
- Revenue: +6.4% (despite lower volumes) driven by price increases, especially in Specialised Nutrition and Ingredients.

Milk price jumped 19.1% to €59.66 per 100 kg, and €228m was paid to member farmers for sustainability achievements in 2024.

Novus Award Builds Transatlantic Dairy Science Bridges

The NOVUS Award fosters young dairy scientists' careers by funding reciprocal attendance at EAAP and ADSA annual meetings. This year's EAAP winner, Martin Julius Gote of KU Leuven, presented AI-powered real-time milk yield prediction research at ADSA in the US. The 2025 ADSA winner will be revealed later this month.

Test Your Dairy Smarts!

Think you know dairy? From milk chemistry to processing.....

Step up your game with Dairy Planet's interactive quizzes—designed to sharpen your understanding, test your insights, and make learning fun! Whether you're a student, an industry enthusiast, or a professional, our carefully curated quizzes cover everything from milk chemistry and dairy processing to trivia that connects your knowledge to winning.

 **Fast. Fun. Knowledge-packed.**

 **For students, enthusiasts, and professionals.**

Ready to prove your skills?

START NOW



dsm-firmenich Flags Global Mycotoxin Risks

The World Mycotoxin Survey 2025 (10,868 samples from 81 countries) found:

- Top toxins: DON, ZEN, and FUM.
- High-risk regions: The Americas, South Asia, China, and Taiwan.
- Concerns: North America faces high DON & ZEN exposure; South Asia sees widespread aflatoxins; China/Taiwan reports near-universal fumonisin presence.

Europe struggles with significant DON, aflatoxin, and fumonisin challenges, posing risks to dairy feed safety.

Dairy News Round-Up: Indian & International Dairy Updates

In the fast-changing world of dairy, every day brings fresh challenges, innovations, and opportunities. From the heart of India's milk belt to the world's largest dairy markets, we bring you crisp, credible, and current updates — all in one place.

Frida Serves Up Breast Milk Ice Cream for National Breastfeeding Awareness Month

Frida has announced the official launch of its much-talked-about Breast Milk Ice Cream, created in collaboration with OddFellows. Described as “freshly expressed and oddly familiar” – sweet, salty, and smooth with hints of honey – the flavor is formulated to mimic the taste and nutrient profile of breast milk, including colostrum. Packed with Omega-3 fats, lactose, vitamins, minerals, and hydration, the scoop is a playful nod to the real thing.



The limited-edition treat will be available at the Frida Pop Up inside OddFellows' Dumbo, NYC location (44 Water St.) from Aug. 5–10, with free scoops offered Wednesday through Sunday from 12–1 p.m. Pints can also be shipped nationwide via Frida.com. This launch arrives just in time for National Breastfeeding Awareness Month and follows Frida's latest innovation, the 2-in-1 Manual Breast Pump.

Rajasthan Launches First-Ever Sex-Sorted Semen Lab to Boost Dairy Productivity



Rajasthan has marked a milestone in dairy innovation with the launch of its first sex-sorted semen lab. This cutting-edge facility is expected to revolutionize livestock breeding by significantly increasing female calf births, paving the way for higher milk yields and improved farm incomes. The initiative promises a transformative impact on the state's dairy sector, strengthening its position as a leading milk producer in India.

World's Largest Dairy Farm to Rise in Algeria — Aiming for 50% Milk Powder Self-Sufficiency

In a landmark deal, GEA CEO Stefan Klebert, Baladna (Qatar's leading dairy producer), and the Algerian government have signed an agreement to build the world's largest integrated dairy farm and milk powder facility in Algeria's Adrar province.

The mega-project will:

- Produce 100,000 tonnes of milk powder annually at full capacity.
- Cover 50% of Algeria's milk powder needs, slashing imports.
- Create 5,000 local jobs.

Construction kicks off in early 2026, with the first production targeted for late 2027 and gradual scale-up.

Algeria is currently the third-largest importer of milk powder globally, and this state-of-the-art facility — backed by Algeria's National Investment Fund and Baladna Algeria S.P.A. — will mark a major step towards food security and economic growth. GEA's role spans the entire value chain — from dairy farming to processing and packaging — making this one of the company's largest-ever orders.

"We're proud to help strengthen food security and economic development in the region," said Klebert.

Fonterra Expands NZ Cheese Production to Feed Millions More Burgers & Pizzas



Fonterra's Eltham site in Taranaki, NZ, is boosting its cheese output to meet soaring global QSR demand. The upgrade will allow for 200 million more cheeseburgers and 40 million extra pizzas annually, thanks to expanded processed cheese capacity and an additional mozzarella shift.

Already exporting to 50+ countries, Fonterra is targeting Asia-Pacific's 7.5% annual growth in urban dining. "Population growth and urbanization are driving demand," said Hailey Ryan, GM for Global QSR.

FAO & OECD: Global Animal Agriculture to Grow 14% by 2034

Global animal agricultural production is projected to rise 14% in the next decade, with per capita consumption up 6%, according to the FAO and OECD. Growth will be concentrated in emerging economies driven by rising populations and prosperity, though consumption will remain highest in high-income countries.

Key projections:

- Meat, fish & dairy consumption up 13% overall.
- In middle-income countries, growth will be split evenly between population expansion and higher per-person intake.
- In poorer nations, per-capita consumption will stagnate, but total demand will climb with population growth.

Trade & transport:

By 2034, 22% of calories consumed globally will be imported, reflecting longer supply chains and increasing interdependence in food systems.

Productivity & sustainability:

Production gains will stem from higher productivity per animal/hectare, technological adoption, capital investment, and more intensive input use, alongside agricultural land expansion in Africa and South Asia. Greenhouse gas emissions from primary agriculture are forecast to rise 6% — slower than output growth — with emissions intensity per kilogram falling. Adoption of low-emission practices could lift productivity by 15% while cutting emissions 7%.

Arla Foods UK Appoints Fran Ball as SVP of Supply Chain

Leeds-based Arla Foods UK has promoted Fran Ball to Senior Vice President of UK Supply Chain, expanding her remit from production to include logistics and oversight of 2,800 colleagues. The move supports Arla's "farm to fridge" strategy and operational growth plans.



With 20+ years in manufacturing, Ball is known for championing diverse leadership and driving operational excellence. She succeeds Bas Padberg, who praised her record of innovation and efficiency across UK sites.

The company aims to leverage her leadership to strengthen supply chain performance and sustain quality dairy delivery nationwide.

Country Delight Doubles Protein in Milk to Tackle India's "Silent" Nutrition Gap

Indian dairy brand Country Delight has launched a high-protein cow milk delivering 30g of protein per 450ml—nearly twice that of regular milk—aimed at addressing India's widespread yet often overlooked protein deficiency, especially among vegetarians.

Produced through a natural filtration process without added powders or synthetic ingredients, the milk meets growing consumer demand for clean-label, nutrient-rich foods.

The move follows a broader market trend, with major players like Mother Dairy and Amul exploring high-protein innovations to boost public health.

By combining nutrition, transparency, and innovation, Country Delight hopes to set a new standard in India's dairy sector.



Ecuador Expands Dairy Footprint in Central America with First Milk Exports to El Salvador

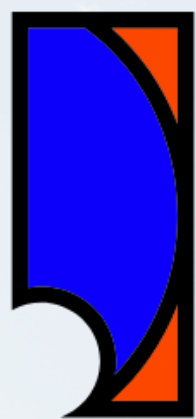
Ecuador's dairy sector has scored a major win in its internationalization drive, exporting whole and skimmed milk to El Salvador for the first time — adding to UHT milk shipments already underway since May. Enabled by a new zoosanitary certificate approved in April, this move positions El Salvador as a strategic market for Ecuador's surplus production. While Pichincha, Santo Domingo, Cotopaxi, Manabí, and Carchi lead national output, the formal industry still captures just 51.8% of total milk. With declining capture rates at home, these exports mark a critical step toward diversifying markets and strengthening the dairy value chain.

Florida Raw Milk Outbreak Sickens 21 — Keely Farms at Center of Health Probe

The Florida Department of Health has traced a raw milk outbreak to Keely Farms Dairy in New Smyrna Beach, where 21 people — including six children — have fallen ill with E. coli or campylobacter since January. Seven have been hospitalized, some facing severe complications.

Raw milk sales for human consumption are illegal in Florida, yet Keely Farms reportedly promoted products via private Facebook groups. Authorities are now working with the farm to improve sanitation as the raw milk debate reignites nationwide.

MENA Dairy Congress 2026: Your Gateway to the Region's Fastest-Growing Dairy Market



MENA Dairy Congress

30-31 March 2026
Al-Ain, UAE

The MENA Dairy Congress returns on March 30–31, 2026 in Al Ain, UAE, bringing together global experts, industry leaders, and government officials to tackle the region's biggest dairy opportunities and challenges.

With the Middle East and North Africa emerging as one of the world's fastest-growing dairy markets, this two-day event offers unmatched access to insights on food safety, sustainability, genetics, AI in dairy, export strategies, camel milk innovations, and success stories from brands like Arla and Almarai.

Highlights include:

- B2B meetings and gala dinner for high-value networking
- Government and industry participation from over 20 countries
- Exclusive site visits to farms and processing facilities
- Sessions on HORECA supply, food tech, and hot-climate breeding

July
17

Special early-bird rate available until September 1, 2025

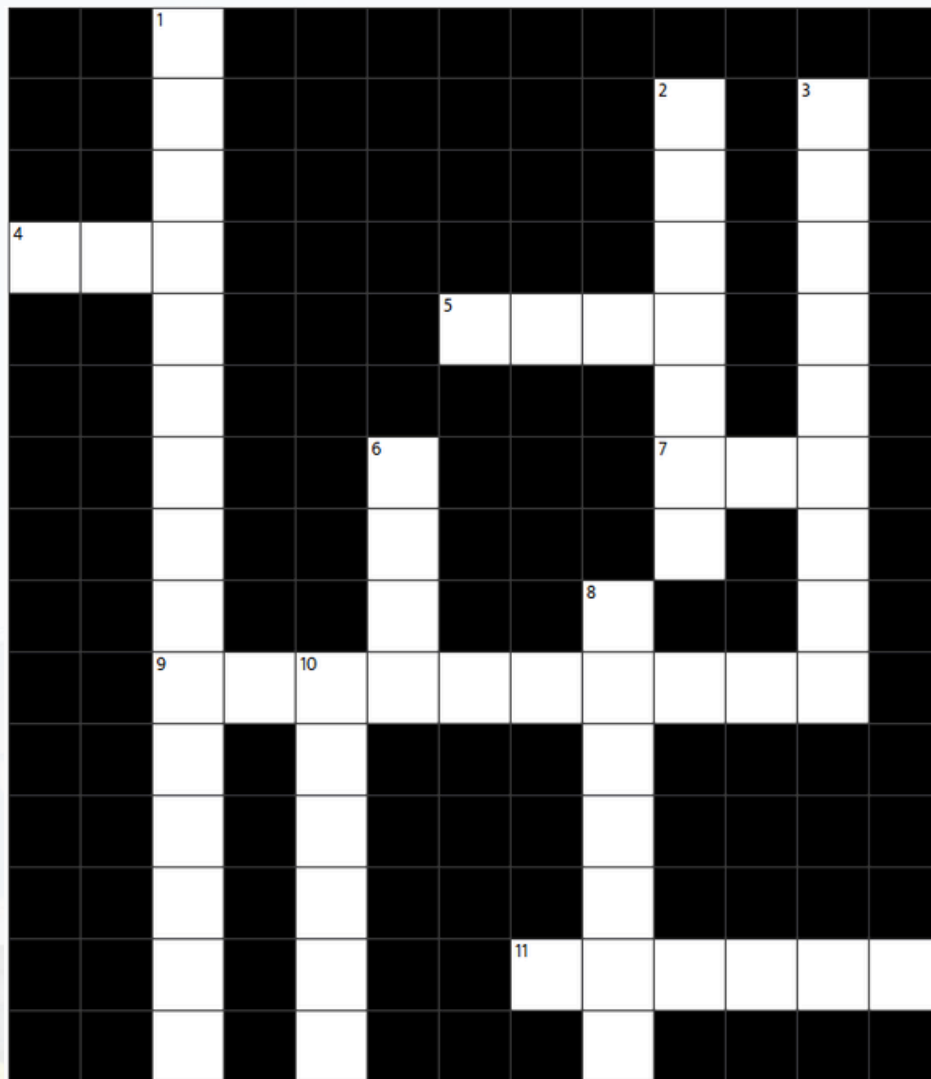
REGISTER NOW



Crossword Puzzle

DOWN

- 1 This white revolution transformed India's dairy sector
- 2 Most abundant sugar in milk
- 3 Equipment used to remove dirt and debris from milk using centrifugal force
- 6 Standard heat treatment for milk at 72°C for 15 seconds
- 8 Test to detect antibiotics in milk
- 10 Protein fraction that coagulates at pH 4.6



ACROSS

- 4 Heat treatment at 135–150°C for 2–5 seconds
- 5 Test used to check microbial load by observing color change
- 7 The non-fat portion of milk solids
- 9 Device used to measure milk density for SNF estimation
- 11 The father of the White Revolution in India

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