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Reimagining the Dairy Value Chain: From Subsistence to Smart Commercial Dairying

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From Symbiosis to Systems: The Evolution of Agriculture and Livestock

Human civilization has always depended on a delicate balance between nature, crops, and animals. From early domestication to modern agriculture, this relationship has ensured survival, nutrition, and economic stability. Over centuries, humans transitioned from nomadic lifestyles to settled farming systems, yet their dependence on livestock and agriculture has remained constant. With time, the movement of plants and animals across regions led to the creation of “source” (production) and “sink” (consumption) zones. This geographical imbalance naturally demanded systems for storage, processing, and transportation—laying the foundation for commercialization. However, unregulated expansion and the dominance of intermediaries often disrupted this balance, leaving both producers and consumers at a disadvantage.

Milk: The Most Sensitive Commodity in the Value Chain

Among all agricultural products, milk occupies a unique position. It is highly perishable, produced daily, and demanded continuously. Unlike grains, milk cannot be stored easily without processing, making its efficient handling critical. In India, despite being the world’s largest milk producer, disparities in distribution persist. Rural areas often experience surplus and wastage, while urban centers face shortages or compromised quality. This mismatch reflects inefficiencies in the dairy value chain—particularly in collection, chilling, processing, and distribution. Addressing this gap requires a structured, technology-driven, and commercially viable dairy system that ensures fair returns to farmers while delivering safe and quality milk to consumers.

Why a Shift Toward Commercial Dairying is Inevitable

The transition from traditional dairying to a commercial enterprise is no longer optional—it is essential for sustainability and growth. Several factors support this transformation:

- **Economic Significance:** Milk is the largest agricultural commodity in India by value, surpassing even food grains.
- **Equitable Asset Distribution:** Unlike land, livestock ownership is more evenly distributed, especially among small and marginal farmers.
- **Year-Round Income:** Dairying provides continuous income, unlike seasonal crop agriculture.
- **Women Empowerment:** A significant proportion (70–80%) of dairy-related activities are managed by women, making it a key driver of inclusive development.
- **Income Enhancement:** A major share of farmers' income from livestock comes from milk, and this share has been steadily increasing over the years.

These factors collectively indicate that strengthening the dairy sector through commercialization can significantly contribute to poverty reduction and rural prosperity.

Challenges in the Existing Dairy Value Chain

Despite its importance, the dairy sector faces multiple bottlenecks:

- **Fragmented Production System:** Small-scale farmers with limited market access
- **Inadequate Infrastructure:** Lack of chilling centers, cold chains, and processing units
- **Post-Harvest Losses:** Significant wastage due to poor storage and transport
- **Middlemen Dominance:** Reduced profit margins for producers
- **Quality and Safety Concerns:** Adulteration and lack of standardization
- **Feed and Fodder Constraints:** Affecting productivity and cost efficiency

These challenges highlight the urgent need for a systemic overhaul of the dairy value chain.

Building a Modern Dairy Value Chain

1. Strengthening Collection and Cold Chain Systems

Establishing village-level milk collection centers with bulk milk coolers can prevent spoilage and maintain quality. Integration of cold chain logistics ensures that milk reaches processing units without deterioration.

2. Promoting Farmer Producer Organizations (FPOs) and Cooperatives

Organizing farmers into cooperatives or FPOs enhances their bargaining power, reduces dependency on middlemen, and ensures better price realization. Successful models

like cooperative dairying demonstrate the potential of collective action.

3. Leveraging Digital and Smart Technologies

Digital platforms can connect farmers directly with markets, provide real-time pricing, and enable traceability. Smart sensors, automated milking systems, and data-driven herd management can further improve efficiency and productivity.

4. Encouraging Value Addition and Diversification

Processing milk into products like cheese, paneer, yogurt, butter, and functional foods increases shelf life and profitability. Value addition also opens opportunities for branding and export.

5. Ensuring Quality and Safety Standards

Adopting strict quality control measures, certification systems, and traceability mechanisms is essential to build consumer trust and expand market reach.

6. Sustainable Resource Management

Commercial dairying must align with environmental sustainability. Efficient water use, waste management, and climate-resilient practices are crucial to prevent resource depletion.

Role of Policy and Institutional Support

Government agencies, agricultural universities, and research institutions must play a proactive role in facilitating this transition. Policies should focus on:

- Infrastructure development (cold chains, processing units)
- Access to credit and insurance for farmers
- Training and capacity building
- Promotion of startups and dairy entrepreneurship
- Encouraging public-private partnerships

Such interventions can create an enabling environment for a robust and resilient dairy sector.

From Livelihood to Enterprise: The Core Transformation

The most critical shift lies in changing the perception of dairying—from a subsistence-based household activity to a profit-oriented enterprise. This involves:

- Scientific herd management
- Market-oriented production
- Financial planning and record keeping

- Adoption of modern technologies

This transformation will empower farmers to become entrepreneurs rather than mere producers.

Conclusion

The future of dairying in India depends on how effectively the value chain is restructured and modernized. A well-integrated commercial dairy system can bridge the gap between surplus and scarcity, ensuring efficiency, equity, and sustainability. By embracing commercialization with a balanced approach—protecting farmer interests, ensuring consumer satisfaction, and conserving natural resources—the dairy sector can become a powerful engine of economic growth. The time has come to move beyond traditional practices and build a smart, resilient, and inclusive dairy ecosystem that benefits every stakeholder—from the rural farmer to the urban consumer.