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## "Dairy Dynamics: Mapping The Present Scenario And Predicting Future Trends In India's Dairy Industry"

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### ABSTRACT:

The dairy sector in India has seen a significant transformation, Due to the presence of dairy cooperatives such as those involved in Operation Flood, This has been crucial for India's growth prospective However, in the 1950s and 1960s, India faced milk deficits and low production rates. The establishment of the NDDB and the 'Anand Pattern' of cooperatives helped turn things around. Led by Dr. Verghese Kurien, the NDDB played a key role in revolutionizing the Indian dairy industry and depiction as “the largest milk producer globally” present study examine about milk production and consumption in the country, tries to explores the relationship between the country's milk production and its international exports, the constant efforts made by the Government of India through the implementation of productivity enhancement and development programmes from time to time to upsurge milk production ,critical analysis regarding the requirements of dairy farming, constraints faced by the commercial farmers, threats and opportunities in the industry, and all other pertinent factors are addressed in the review for future strategizing. This study is Descriptive in nature, involves compiling of existing data sourced from a variety of channels. This includes internal sources or, more commonly, external sources (such as government statistics, organisational bodies, and the internet). **Keywords:** Dairy Industry, milk Production, Market, Consumption, Development, per capita milk availability and KMF.

### 1.0 Introduction:

The dairy industry plays a crucial role in India's socio-economic structure, with dairy animals being the cornerstone of the country's livestock wealth. This sector not only complements agriculture but also serves as a significant source of affordable and nutritious food for millions of people in India. India holds the title of the world's largest milk producer, a feat achieved through the milk revolution initiated by the National Dairy Development Board (NDDB) in 1970. This transformative program, spearheaded by Mr. Verghese Kurien, led to India surpassing the USA as the top milk producer in 1988. Dairy activities have long been a fundamental part of India's rural economy, contributing significantly to the overall agricultural landscape of the country. India's milk production represents approximately 17% of the global output, highlighting the importance of this sector in the Indian rural economy.

The India Dairy Food market consists of a mix of national and international companies specializing in creating various value-added dairy products, with the market evolving rapidly. Following the White Revolution, the Indian dairy industry has seen consistent growth in milk production and per capita milk availability, increasing from 51.4 million tons in 1990 to approximately In the fiscal year 2016-17, the total amount reached 165.4 million tons, while the daily average stood at 355 grams. The Indian dairy market experienced a Compound Annual Growth Rate (CAGR) of 13% from 2010 to 2016, projecting a market value exceeding INR 16,000 Billion by 2022.During the 1950s and 1960s, the Indian dairy industry

witnessed significant milestones with the introduction of Operation Flood, the Amul pattern, and the White Revolution. These initiatives played a crucial role in shaping the history of the industry in India. With a continuous rise in domestic demand for dairy products and a significant demand-supply gap, India may become a net importer of dairy products in the future, necessitating the urgent resolution of challenges and the implementation of strategies for the industry's prosperity

### **1.1 Dairy industry in India, its growth**

Since Operation Flood in 1970, the Indian dairy industry has seen significant growth through the introduction of cooperatives to boost milk production, increase rural income, and ensure fair prices for consumers. The village milk producer's cooperative and district cooperative milk producers' unions play a vital role in providing services like milk collection, cattle feed, artificial insemination, and veterinary care. To meet global standards and address non-tariff barriers, Indian dairy companies are working to comply with sanitary and phyto-sanitary regulations set by the OIE under the WTO. The government's economic reforms have led to increased private sector involvement in the industry, focusing on value addition and product diversity to meet the demand for new products and processes.

### **1.2 World dairy status**

The global dairy industry has experienced significant growth over the past 30 years, with world milk production increasing by more than 50%. In 1982, the total milk production was 482 million tonnes, which surged to 806.70 million tonnes by 2015. Some of the top milk-producing countries include India, the United States, China, Pakistan, New Zealand, Brazil, France, and Germany. These nations have established themselves as key players in the dairy market, contributing significantly to the overall milk production worldwide. On the other hand, there are countries that face milk deficits, such as China, Italy, the Russian Federation, Mexico, Algeria, and Indonesia. These nations rely on imports to meet their domestic demand for dairy products due to insufficient local production. The dairy industry plays a crucial role in the livelihoods of over 180 million households globally. These households are engaged in various aspects of dairy farming, from milk production to processing and distribution, highlighting the widespread impact of the dairy sector on economies and societies worldwide.

## **2.0 Review of Literature**

The literature review is Originating from research papers, thesis, and journals. The section wraps up with a comprehensive overview of the entire review. The research topic is analytical and comparative, with limited existing research.

"Dairy Farming" (1998), Deepak Shah, in his book delves into the Dairy cooperatives in Maharashtra and highlights the success of the operation flood Programme. However, this success is not uniform across the entire state, as it is limited to two specific regions. The primary factor behind this discrepancy lies in the poor management of all dairy cooperatives and the impact of the differential price structure on milk procurement. Consequently, there is a pressing need for a professional dairy management system to oversee these operations in Maharashtra.

Dr. P.A.Koli delves into the Indian Dairy Industry in his book "Dairy Development in India, Challenges before Co-operatives" (2007), exploring its history, the obstacles it has encountered, and the strategies it has employed to surmount these challenges. The author also provides insights into the operations of Gokul Dairy in Kolhapur and Warna Dairy industries to offer a more comprehensive understanding of the dairy system in India.

Lipismita Samal and A. K. Pattanaik conducted a study titled "Dairy Production in India - Existing Scenario and Future Prospects" in 2013-14. The study revealed that dairy production in India has experienced significant growth since the country's independence. This growth can be attributed to strategic decisions related to selective breeding, improved feeding practices, and better healthcare management for livestock. However, despite these positive developments, the dairy sector still faces several challenges that hinder its overall growth. These challenges include low animal productivity, a high population of humans and livestock, land degradation, and a shortage of feed ingredients and resources. While the agricultural sector is experiencing stagnation or a decline in growth rate in certain areas, the dairy sector shows more promising prospects.

According to Patel (2017), milk production experiences an annual growth rate of only 4%, while consumption grows at approximately 6% annually. The availability of milk per capita has significantly increased, rising from 120 grams per day per person in 1960 to 307 grams per day per person in 2013-2014, and further increasing to 359 grams per day per person in 2014-2015. Patel also highlighted the

projection by the National Dairy Development Board that India's milk demand may reach 200 million tonnes by 2021-2022. However, he expressed concern over India's insignificant share in the global export market, despite being the largest producer of milk in the world.

Dr. K.G. Karmakar and Dr. G.D. Banerjee (2006) outlined in their publication, "Opportunities and Challenges in The Indian Dairy Industry," that the Indian dairy sector stands as the largest milk producer globally, contributing to 13% of the world's milk supply. Despite this, the milk processing industry remains relatively small in comparison to the vast quantities produced annually. The unorganized sector in India plays a crucial role in collecting milk from various sources and distributing it to both urban and rural areas. On the other hand, the organized dairy industry, particularly the cooperative milk processors, holds a 60% market share. These cooperatives primarily focus on supplying liquid milk, processing 90% of the collected milk in this form. In contrast, private dairies concentrate more on processing milk products, with only 20% of the collected milk being sold as liquid milk and 80% as other dairy products. The current scenario is significantly influenced by globalization and liberalization, which are rapidly shaping the industry.

The consumption of milk and dairy products per capita in India is on the rise, driven by the increasing income levels and urbanization. This has led to a growing demand for dairy products, particularly cheese, in hotels, restaurants, and cafes, where it is used as a key ingredient in various cuisines. According to Invest India (2022), the cheese market in India is projected to experience a compound annual growth rate (CAGR) of 20.6% from 2020 to 2025.

The anticipated increase in value-added products such as flavoured milk, processed packed milk, cheese, curd, etc., is estimated to be around 13%-15%. Therefore, initiatives like the dairy processing and infrastructure development fund are expected to enhance infrastructure, potentially lowering production costs and increasing the manufacturing of value-added products. (Food Marketing Technology 2022).

India stands out as a major player in the global milk production arena, contributing to approximately 17% of the world's total output. Despite this, a significant portion of the milk generated in India remains unprocessed and is primarily consumed within the local market. Merely 20% of the milk is managed by the organized sector, comprising cooperatives and private dairies. The organized sector is experiencing rapid growth and is projected to elevate its contribution to milk production from 30% to 65% by the year 2021-22. This sector is dedicated to delivering high-quality milk and value-added products at competitive prices to consumers, while also ensuring equitable returns to the farmers. (AgriTimes 2019).

The calibre of milk is a significant competitive advantage for dairy firms, affecting the demand, pricing, and potential value-added of milk and its derivatives. Consumers are growing more mindful and selective about the quality and safety of dairy products, as well as their nutritional and environmental effects. Consequently, dairy businesses must supervise and regulate the factors that influence milk quality throughout the supply chain, from farm to table. (Nanda Kumar et al. 2022).

Thanks to the government's active involvement in providing necessary resources and implementing various schemes, millions of farmers have discovered income generation opportunities in the dairy sector. The dairy industry also recognizes the significance of private sector participation in ensuring the sector's growth and prosperity, similar to other manufacturing sectors. To achieve high yielding cattle, it is crucial to have quality cattle breed and nutritious feed and fodder. To meet these requirements, the government has partnered with the private sector to invest in scientific interventions, such as establishing IVF laboratories and making reproductive technologies available at affordable prices for farmers. These initiatives also aim to improve the genetic quality of the cattle population and preserve indigenous cattle breeds. (IBEF 2022).

The dairy sector and rural economy in India were significantly impacted by the White Revolution. This initiative led India to become the world's largest milk producer, surpassing the United States in 1998. The per capita availability of milk also saw a substantial increase from 112 grams per day in 1970 to 355 grams per day in 2014. Furthermore, it played a crucial role in enhancing the income and livelihoods of numerous rural families involved in dairying. Presently, India stands as a key producer and consumer of dairy products, while also exporting value-added items like milk powder, butter, and cheese it is revealed from testbook.com

Brijesh Jha's research paper titled 'India's Dairy Sector in Emerging Trade Order' provides an analysis of the growth of the dairy industry in India. The major players in the export market are the US, New Zealand, EU, and Australia. India also exports a significant quantity of milk products. However, it faces challenges due to the arbitrary quality standards imposed by some developed countries. The liberalization of trade in 1991 has led to the increased importance of dairy trade in India. During the 1990s, the dairy trade experienced fluctuations, making it difficult to identify any specific trend. These fluctuations were primarily influenced by world prices. While India was a net importer of dairy products in the 90s, it has now emerged as a net exporter in recent years.

In the article by Rakesh Mohan Joshi, it is noted that India is the top milk producer globally, but became a net importer in 2010-12 due to rising domestic demand. India's share in global milk exports is 0.68%, while its share in imports is 0.04%, influenced by its production. Challenges to India's milk exports include higher availability of buffalo milk, lack of large-scale production, low per unit production, and high domestic demand.

### 3.0 Objectives of the research:

The research aims to achieve the following goals:

1. To understand the current state of the Indian Dairy Industry and its increasing demand in the global market.
2. To investigate the production and consumption patterns of milk in the country.
3. To investigate the production and consumption patterns of milk in the country.
4. To examine the growth of the Indian Dairy Industry, as well as its market constraints and challenges
5. To understand milk scenario in the state of Karnataka.

### 4.0 Research Limitations:

The data collection and interpretation process revealed certain constraints. Although the period and amount of data were deemed acceptable, a more extended period and more extensive data would have allowed going for more analysis. The current study was limited to the overall milk production and consumption scenario of the country over the recent past year's statistical data, partially covering the state of Karnataka. An in-depth study can be undertaken on a specific area in future. Statistical techniques are not employed for this research analysis.

#### 4.1 Research Approach

Research can be categorized into two main types: qualitative and quantitative.. Qualitative research is based on theory, whereas quantitative research is based on data collection and analysis. The purpose of this study is to examine the development and obstacles faced by the dairy industry. Therefore, quantitative research is applied in this study.

**4.2 Research design:** This section will explain how data collected from online published sources; will be presented using tables, charts, and narratives. Tables organize numerical or categorical data; Charts visually represent data, illustrating trends or relationships. Narratives describe qualitative data, highlighting themes or interpretations.

**4.3 Data collection method and analysis:** The study utilized secondary data obtained from a variety of sources, including publications, journals, magazines, newspaper articles, publications from government departments at both state and central levels, research articles available on websites, and other internet sources.

**Table 1: World Rank – Top Milk Producing Countries**

Rank	Country	Milk production in tones 2021
1	India	208,984,430
2	United States	102,654,616
3	Pakistan	65,785,000
4	China	41,245,664
5	Brazil	36,663,708
6	Germany	33,188,890
7	Russia	32,333,278
8	France	25,834,800
9	Turkey	23,200,306
10	New Zealand	21,886,376

**Source: Food And Agriculture Organization.**

In 2021, India topped the list with a milk production of 208,984,430 tons. The United States followed in second place with 102,654,616 tons, while Pakistan ranked third with 65,785,000 tons. China and Brazil secured the fourth and fifth positions with 41,245,664 tons and 36,663,708 tons respectively. Germany, Russia, France, Turkey, and New Zealand also made it to the top 10, with milk productions ranging from 33,188,890 tons to 21,886,376 tons

**Table 2: Top Milk Consuming Countries in the world**

Rank	Country	Milk Consumption (in 1000 MT)
1.	EU-27	140,400.00
2.	India	121,495.00
3.	United States	88,768.00
4.	China	31,774.00
5.	Russian Federation	31,405.00
6.	Brazil	30,803.00
7.	New Zealand	17,926.00
8.	Mexico	11,261.00
9.	Argentina	11,045.00
10.	Ukraine	10,793.00

**Source: Food and Agriculture Organization**

India, with a staggering milk consumption of 121,495,000 metric tons, solidifies its position as the second largest country in terms of milk consumption worldwide. India has established itself as a strong competitor in the global milk consumption market, with a significant consumption of 121,495,000 metric tonnes (1000 MT) in 2024. India's high milk consumption reflects its significant role in dairy production and consumption, influenced by its culinary traditions and cultural practices.

**Table 3 World's Leading Dairies, Largest Dairy Companies by Milk Sales, (Fiscal Year 2021)**

Rank	Dairy Company	Headquarters place	Dairy product sales revenue in bn. US\$
1	Nestlé	Switzerland	26.7
2	Lactalis	France	21.3
3	Danone	France	20.9
4	Dairy Farmers of America	United States	19.3
5	Yili Group	China	18.2
6	Fonterra	New Zealand	14.8
7	Mengniu Dairy	China	13.7
8	FrieslandCampina	Netherlands	13.6
9	Arla Foods	Denmark	13.3
10	Saputo Inc.	Canada	12.0
11	Amul	India	8.3
12	Savencia Fromage & Dairy	France	6.6

**Source:** <https://dairynews7x7.com/>

**Table 4:Key Statistics For India's Dairy Industry**

Characterstics as per 2023-24	Data
Annual Milk Production	Post forecasts MY 2024 (January-December) fluid milk production at 212.7 million metric tons (MMT)
India's Export Of Dairy Products	67,572.99 MT to the world for the worth of Rs. 2,269.85 Crores or 284.65 USD Millions was recorded for the fiscal year 2022-23..
Share Of World Dairy Production	24.64% of global milk production in the year 2021-22.
Number Of Milk Producers Cooperative Unions	At present, there are 228 dairy cooperative milk unions in India.
Number Of State Cooperatives	In financial year 2019, over 190 thousand dairy cooperative societies were present across India. In that particular year, the highest number of cooperative societies, exceeding 66 thousand, was located in the northern region of the country.
Per capita Availability ( Drinking Milk)	459 grams per day in 2022-23.

Source: <https://www.investindia.gov.in/sector/animal-husbandry-and-dairying>

India holds the title of being the largest producer of milk in the world, accounting for over 17% of the global production with 165.4 million tonnes in 2016-17. The country also boasts a significant share in the world's livestock population, representing 17% of the total livestock, 57.3% of total buffaloes (105 million), and 14.7% of total cattle (200 million). In terms of contribution to India's GDP, the dairy sector holds a share of 3.6% (13.7% in agriculture). Additionally, dairy farming serves as a secondary source of income for 70 million rural households engaged in dairying. The growth rate of milk production stands at 5.15% (2015-16), while the consumer demand rate is at 5%. Furthermore, there are 4.5 million women members actively involved in dairy cooperatives across the country as of March 2016.

**Table 5: Year Wise Production of Milk In Tonnes. Year- and State-wise Total Milk Production in India Production 2020-21 (Thousand Tonnes)**

State	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
All India	1,37,68	1,46,314	1,55,49	1,65,40	1,76,347	1,87,749	1,98,44	2,09,96	2,22,06	2,30,577
Andhra lesh	13,007	9,656	10,817	12,178	13,725	15,044	15,263	14,714	15,403	15,448
Arunachal lesh	43	46	50	53	54	55	61	44	46	46
Assam	815	829	843	861	872	882	920	954	982	1,006
Bihar	7,197	7,775	8,288	8,711	9,242	9,818	10,480	11,502	12,253	12,503
Chhattisgar	1,209	1,232	1,277	1,374	1,469	1,567	1,676	1,747	1,848	1,956
Goa	68	67	54	51	55	57	61	60	63	64
Gujarat	11,112	11,691	12,262	12,784	13,569	14,493	15,292	15,853	16,722	17,281
Haryana	7,442	7,901	8,381	8,975	9,809	10,726	11,735	11,284	11,630	11,966
Himachal lesh	1,151	1,172	1,283	1,329	1,392	1,460	1,531	1,576	1,615	1,617
J & K	1,615	1,951	2,273	2,376	2,460	2,540	2,506	2,595	2,727	2,817
Jharkhand	1,700	1,734	1,812	1,894	2,016	2,183	2,321	2,434	2,629	2,774
Karnataka	5,997	6,121	6,344	6,562	7,137	7,901	9,031	10,936	11,796	12,829
Kerala	2,655	2,711	2,650	2,520	2,576	2,548	2,544	2,534	2,532	2,580
Madhya lesh	9,599	10,779	12,148	13,445	14,713	15,911	17,109	17,999	19,004	20,122
Maharashtr	9,089	9,542	10,153	10,402	11,102	11,655	12,024	13,703	14,305	15,042

Manipur	82	82	79	79	82	86	90	71	76	72
Meghalaya	82	83	84	84	85	87	88	89	90	94
Mizoram	15	20	22	24	25	26	24	25	25	24
Nagaland	81	76	77	79	74	73	62	56	61	50
Odisha	1,861	1,903	1,930	2,003	2,088	2,311	2,370	2,373	2,402	2,476
Punjab	10,011	10,351	10,774	11,282	11,855	12,599	13,348	13,394	14,077	14,301
Rajasthan	14,573	16,934	18,500	20,850	22,427	23,668	25,573	30,723	33,265	33,307
Sikkim	46	50	67	54	59	61	84	74	87	87
Tamil Nadu	7,049	7,132	7,244	7,556	7,742	8,362	8,759	9,790	10,107	10,317
Telangana		4,207	4,442	4,681	4,965	5,416	5,590	5,765	5,808	5,855
Tripura	130	141	152	160	174	185	199	206	217	230
Uttar Pradesh	24,194	25,198	26,387	27,770	29,052	30,519	31,864	31,359	33,874	36,242
Uttarakhan	1,550	1,565	1,656	1,692	1,742	1,792	1,845	1,797	1,856	1,859
West Bengal	4,906	4,961	5,038	5,183	5,389	5,607	5,869	6,165	6,414	6,969
A&N Territories	14	16	15	16	17	18	19	15	17	17
Chandigarh	44	44	43	36	42	45	49	52	57	56
Ladakh								15	29	31
D&N Territories of Delhi	11	9	9	8	8	1	1	1	2	2
Daman & Diu	1	1								
Delhi	284	280	281	279	279					488
Lakshadwe	6	4	3	3	3	4	4	4	0.42	0.41
Puducherry	47	48	48	48	49	49	50	50	50	50

Source : [www.nddb.coop](http://www.nddb.coop)

**Table 6: Highest Milk Producing States in India 2023-24**

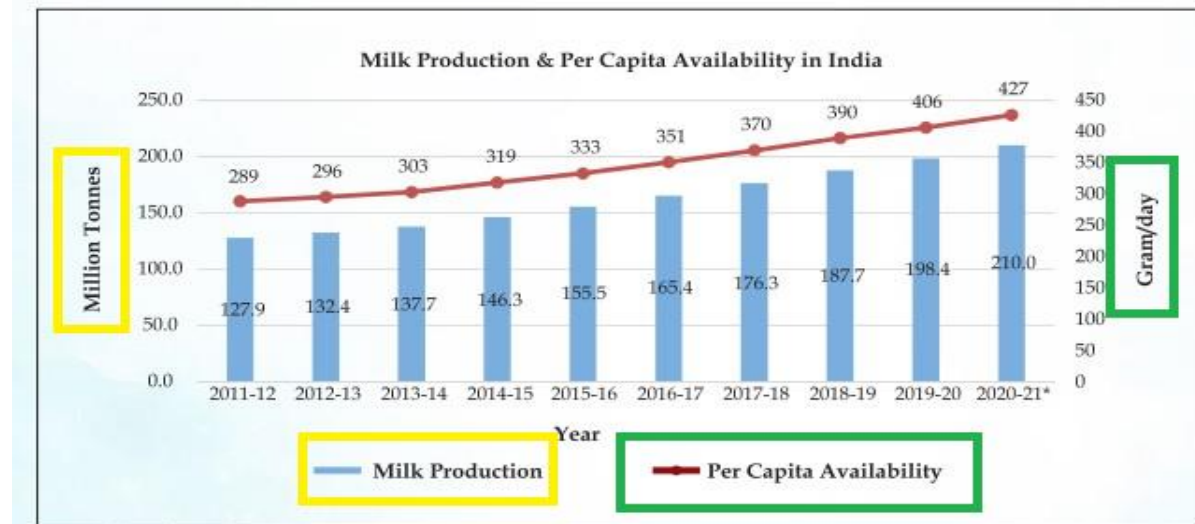
The milk production in different states of India for the year 2014-15, as follows:

1. Uttar Pradesh	Milk produced from Buffaloes: 16.2 MT - Milk produced from Cows-Exotic: 1.7 MT - Milk produced from Cows Non-Descript: 4.2 MT
2. Rajasthan:	Milk produced from Buffaloes: 7.2 MT - Milk produced from Cows-Exotic: 0.9 MT - Milk produced from Cows Non-Descript: 4.1 MT
3. Andhra Pradesh:	Milk produced from Buffaloes: 9.1 MT - Milk produced from Cows-Exotic: 2.5 MT - Milk produced from Cows Non-Descript: 1.2 MT
4. Gujarat:	Milk produced from Buffaloes: 7.2 MT - Milk produced from Cows-Exotic: 2.0 MT - Milk produced from Cows Non-Descript: 2.2 MT
5. Punjab:	Milk produced from Buffaloes: 6.6 MT - Milk produced from Cows-Exotic: 2.8 MT - Milk produced from Cows Non-Descript: 0.3 MT

Source: Department of Animal Husbandry, Dairying and Fisheries.

The milk production in India witnessed a significant increase over the years. From 146.3 million tonnes in 2014-15, it rose to 198.4 million tonnes in 2019-20. According to the Economic Survey, the total milk production in India further reached 209.96 million tonnes in 2020-21. This growth in milk production can be attributed to a compounded annual growth rate of 6.2% from 2014-15 to 2020-21. Additionally, the per capita availability of milk in India also saw a positive trend. It increased from 322 gm/day in 2014-15 to 406 gm/day in 2019-20. Comparatively, the global average per capita availability of milk in 2014-15 was 293.7 gm/day. The preliminary data from the Economic Survey indicates that the per capita milk availability in India for the year 2020-21 stood at 427 grams per day. Notably, Punjab and Haryana emerged as the leading states with the highest per capita milk availability. These two states are at the forefront, showcasing the highest per capita availability of milk in India

**Chart 1: Trend Of Per Capita Availability Of Milk In India( In Gm Per Head)**

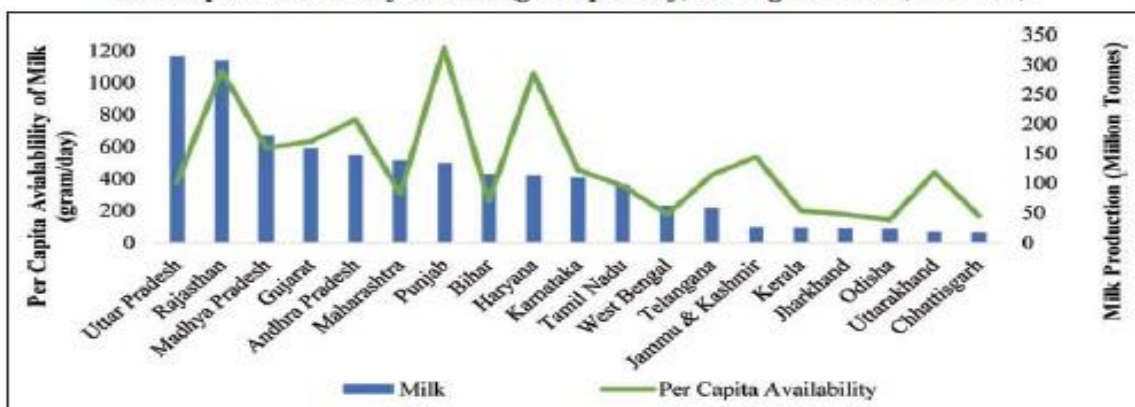


Source : nddb

Milk production grown at an average annual growth rate of 6.3% per year during last six years whereas world milk production is growing at a rate of 1.5% per year. Per capita availability of milk has incased from 307 grams per person per day in 2013-14 to 406 grams per person per day in 2019-2020 that is 32.24%.

**Chart 2: inter-state variability in milk production & per capita availability of milk in india**

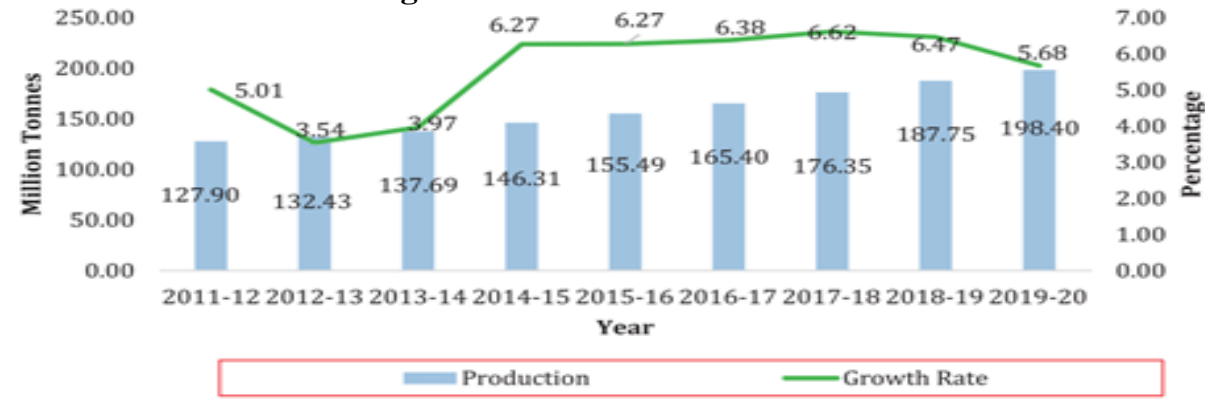
**Figure 22: Inter-State Variability in Milk Production (in million tonnes) & Per Capita Availability of Milk (gram per day) during the Year (2020-21\*).**



Source : economic\_survey\_2021-2022

It is worth mentioning that the per capita milk availability increased significantly from 322 gm/day in 2014-15 to 427 gm/day in 2020-21, exceeding the global average. Punjab and Haryana stand out as the top states with the highest per capita milk availability, reflecting the nation's strides in dairy production and consumption.



**Chart 3 : Trends In Average Annual Growth Rate Of Milk**

Source: Annual Growth Rate in India (Annual Report, Government of India, 2021)

India is ranked first in milk production contributing 24.64 percent of global milk production. Milk production is growing at the Compound Annual Growth Rate (CAGR) of 5.85% over the past 9 years from 146.31 million tonnes during 2014-15 to 230.58 million tonnes during 2022-23.

#### Table 11: Top 10dairy Companies In India

India's dairy sector is valued at INR 14,899.8 billion and has set its sights on creating a \$355 billion industry by 2025. The major contenders within India's thriving dairy sector are as follows:

Company & Founding Industry & Sub-industry	Company type	Details of operations
1 Amul -1946 Dairy: Milk and dairy products	Cooperative	Amul, also infamously known as the Gujarat Cooperative Milk Marketing Federation, is undoubtedly India's largest and most renowned dairy cooperatives. 1. The company has significantly contributed to transforming the dairy industry and has supported the empowerment of local farmers by offering a wide range of dairy products
2 Mother dairy- 1974 Dairy: Milk and dairy products	Public-Private Partnership	Operating as a joint venture between the National Dairy Development Board (NDBB) and the Government of Delhi, Mother Dairy has become a well-established name in the dairy-providing sectors of India. It provides consumers with all types of fresh and quality dairy products, including milk, yoghurt and ice cream
3. The Kerala Cooperative Milk Marketing Federation Ltd (Milma)-1984 Dairy: Milk and dairy products	Cooperative	Milma is a cooperative venture in Kerala that mainly focuses on milk marketing and distribution of fairy products. The company plays a significant role in the advancement of the state's dairy industry, offering customers a diverse range of dairy products. Additionally, the company has played a part in boosting the economic growth of the area and improving the well-being of local farmers through the distribution of dairy goods
4. Mehsana District Cooperative Milk Producers Union Ltd (Dudhsagar Dairy)-1963 Dairy: Milk and dairy products	Cooperative	Dudhsagar Dairy has become a pioneer in milk processing and cooperative dairy management. The company has not only expanded its operations and distributed dairy products, but it has also contributed to the economic development of Gujarat and improved the standard of living for farmers.
5. Karnataka Cooperative Milk Producers Federation Ltd (Nandini)-1974 Dairy: Milk and dairy products	Cooperative	Nandini is a prominent dairy cooperative in Karnataka that is known for its high-quality milk and dairy products. The dairy company holds a stronger presence in the southern part of India, with a primary focus on improving the livelihoods of small-scale dairy farmers through fostering growth. of the dairy sector.
6. Parag Milk Foods-1992 Dairy: Milk and dairy products	Public	Parag Milk Foods Ltd is one of the leading milk companies in Maharashtra. The company has extended its operations to several regions in India and concentrates on providing dairy

		ingredients to numerous prominent food and beverage sectors.. Thus, the company has gained a pivotal role in supporting the food processing sector.
7. Schreiber Dynamix Dairies-1992 Dairy: Dairy Processing	Private	Schreiber Dynamix Dairies Ltd. is a private company that specialises in the processing and manufacturing of various dairy products. While focusing on supplying dairy ingredients to all kinds of food and beverage industries, the company has also expanded its business to other regions of India
8. Tamil Nadu Cooperative Milk Producers Federation (Aavin)-1988 Dairy: Milk and dairy products	Cooperative	Aavin, also known as Tamil Nadu Cooperative Milk Producers Federation Ltd, provides consumers with fresh milk and dairy products in Tamil Nadu and various other regions in India. The company also looks after the welfare of farmers by ensuring the right prices are set for the milk they provide and so on
9. Creamline Dairy Products (Jersey Dairy)-1987 Dairy: Milk and dairy products	Private	Creamline Dairy Products is widely known for its Jersey brand. The Hyderabad-based private dairy company in Telangana specializes in manufacturing a wide range of dairy products such as milk, yogurt, and ice cream. Ensuring quality and innovation in their processed dairy offerings is the company's topmost goal.
10 Telangana State Dairy Development Cooperative Federation -2014 Dairy: Milk and dairy products	Cooperative	Telenga's dairy sector heavily depends on major dairy companies like Telangana State Dairy Development Cooperative Federation Ltd. The company guarantees the provision of high-quality milk and dairy products to customers

#### Source: Processed Food Industry

In the fiscal year 2020-21, India witnessed a remarkable milestone in milk production, as reported by the Department of Animal Husbandry and Dairying (DAHD). The provisional data reveals that the country achieved an unprecedented record of 209 million tonnes of milk, with cows contributing more than half of this remarkable feat. Previously, buffaloes held the leading position in milk production. For instance, in 2016-17, they accounted for approximately 49.2% of India's milk production, while cows contributed 47.3% and goats 3.5% to the total of 165.4 million tonnes. However, the latest statistics indicate a significant shift, with cows now constituting 51% of the country's total milk production in 2020-21. Buffaloes, on the other hand, accounted for 45%, while goats contributed 3%. This surge in milk production resulted in a noteworthy 27% increase, reaching a total of 209.96 million tonnes compared to five years ago.

#### 5.0 Global Market for Indian Dairy Exports in 2023-2024. International Market For Indian Dairy Export 2023-24

The nation is embarking on the flush season with substantial reserves of dairy products. Currently, there's no demand-supply gap in sight, making exports an attractive option. However, the export scenario, apart from milk fat, isn't looking promising. Global market experts predict a sluggish market, with China yet to rejoin. Let's consider the scale of global trade and India's role in exports. India is the largest milk producer globally, contributing a quarter to the world's supply. However, India's \$475 million in exports pales in comparison to the \$101 billion in dairy imports in 2022. Butter fat makes up 44% of Indian dairy exports, followed by milk powders at 23% and casein at 21%. Cheese and paneer account for around 10%. Conversely, cheese is the largest imported segment at around 38%, followed by powders at 25% and casein at 21%. Indian exports of powders and casein match the global import proportions India's dairy sector has experienced remarkable growth, achieving a market value of INR 16,792.1 billion in 2023. This upward trajectory is anticipated to persist, with a forecasted growth rate of 13% from 2024 to 2032. The international recognition of India's dairy industry is evident in the significant export figures. In the 2022-2023 period, India exported 67,572.99 metric tons of dairy products worth over 22 billion Indian rupees globally. This highlights the rapid expansion of both imports and exports in the Indian dairy market.

## 6.0 Major Government Initiatives in Dairy Farming

Central government schemes in India support farmers by modernizing milk processing facilities and value-added plant-making plants, increasing the organized sector's share in milk procurement, processing, value addition, and marketing, and enhancing sustainable bovine productivity.

**a. The Dairy Processing and Infrastructure Development Fund** aims to upgrade milk processing and chilling plants, including value addition, with a total project outlay of INR 11,184 Cr, and a 2.5% interest subsidy.

**b. The Prime Minister's AtmaNirbhar Bharat Abhiyan** stimulus package has introduced the creation of an INR 15,000 crore Animal Husbandry Infrastructure Development Fund (AHIDF). The fund aims to enhance milk and meat processing capabilities, increase farmers' price realization, and boost exports. The scheme includes investments in dairy processing, meat processing, animal feed plants, breed improvement technology, veterinary vaccine and drug production facilities, and animal waste to wealth management. Eligible entities will receive a 3% interest subvention and a maximum repayment period of 8 years.

**c. The National Programme for Dairy Development (NPDD)** scheme has been realigned and will be implemented from 2021-22 to 2025-26, with a budget of INR 1790 Cr. The scheme aims to improve milk and dairy product quality, increase involvement in procurement, processing, value addition, and marketing. It consists of two components: Component 'A', which focuses on developing infrastructure for quality milk testing equipment and primary chilling facilities for State Cooperative Dairy Federations/District Cooperative Milk Producers' Unions/SHGs/MPCs/FPOs, and The Japan International Cooperation Agency (JICA) offers financial support for Component 'B'. The central government's contribution is proposed to be supported through NPDD (Component A).

**d. The Pradhan Mantri Kisan Sampada Yojana (PMKSY)** has been extended until March 2026, with an allocation of INR 4,600 Cr. The scheme will implement various schemes, including integrated cold chain and value addition infrastructure, food processing and preservation capacities, agro-processing cluster infrastructure, food safety and quality assurance infrastructure, human resources and institutions research and development, and operation greens. The project is estimated to generate 5, 44,432 direct/indirect employment by 2025-26.

**e. The Kisan Credit Card scheme** provides timely credit support to animal husbandry and fisheries farmers through a single window. As of 10.11.2023, over 29.87 Lakh fresh KCCs were sanctioned under a nationwide campaign by the Department of Animal Husbandry and Dairy.

**f. The Rashtriya Gokul Mission**, a INR 2400 Cr commitment, aims to increase dairy productivity and milk output, making dairying more profitable for farmers. The scheme provides a 50% capital subsidy up to INR 2 Cr for breed multiplication farms, 50% subsidy for sex-sorted semen, and an IVF pregnancy-accelerated breed improvement program. The primary objective of the National Livestock Mission is to promote the growth of entrepreneurship and enhance the quality of breeds in the poultry, sheep, goat, and piggery sectors. This mission also emphasizes the development of feed and fodder to support the overall improvement of livestock farming. Beneficiaries include individuals, SHGs, FPOs, FCOs, JLGs, and Section 8 companies

## 7.0 Indian Dairy Industry: Growth Drivers & Key Challenges

The Indian dairy industry has experienced remarkable growth due to various factors. Factors such as the expanding population and rising disposable incomes have resulted in a higher demand for dairy products, thereby creating a profitable market for both farmers and dairy companies. Additionally, government programs like Operation Flood have significantly contributed to boosting milk production and establishing a strong dairy infrastructure. The dairy industry is poised for growth, as evidenced by market news indicating a positive trajectory. Reports show a consistent rise in milk consumption and an increasing preference for value-added dairy products. The industry's advancement is further supported by the introduction of innovative dairy products and packaging techniques, catering to the changing preferences of consumers.

**Challenges Faced:** The Indian dairy industry, despite its impressive growth, encounters various challenges. A major concern is the fragmented structure of the sector, where numerous small-scale farmers contribute to overall production. This fragmentation often results in inefficiencies within the supply chain, hindering the industry's capacity to meet increasing demands. Furthermore, dairy farmers face significant challenges due to fluctuating milk prices and the adverse effects of climate change on fodder production.

As the industry continues to expand, it becomes crucial to address these issues in order to ensure the long-term sustainability and resilience of the Indian dairy industry. **Technological Advancements:** The Indian dairy industry has proactively adopted technological advancements to overcome obstacles, boosting productivity and efficiency. By incorporating artificial intelligence and data analytics, farmers can now maximize milk production, track animal well-being, and improve supply chain operations. These cutting-edge solutions empower farmers and drive the industry towards modernization.

**Future prospects:** The Indian dairy industry's future is promising due to a growing population and increasing awareness of its nutritional benefits. Government support and infrastructure investments are expected to further boost growth, making it a key player in India's economic landscape.

### 8.0 SWOT Analysis of Indian Dairy Industry:

**STRENGTHS:** The dairy industry in the country has seen significant growth, with milk production reaching 187.7 million tons in 2018-19. This has led to increased processing availability, increased consumer purchasing power, improved transportation facilities, and indigenously manufactured equipment. The country also has a large number of dairy plants, a vast pool of skilled manpower, and vast natural resources for growth and development.

**WEAKNESS:** The dairy industry faces several weaknesses, including inadequate technologies for tropical climates, erratic power supply, lack of awareness for clean milk production, underdeveloped raw milk collection systems, seasonal fluctuations, regional imbalances, species-wise variation in milk quality, poor cattle and arable land productivity, scarce capital for dairy development programs, lack of proper data records, inadequate implementation of dairy development programs in different agro-climatic zones, lack of marketing avenues, lack of software for dairy schemes, and inadequate infrastructure for dairy business management programs.

**OPPORTUNITIES:** The dairy industry offers numerous opportunities, including improved export potential for both western and traditional milk products, expanding markets for traditional dairy products, increasing demand for fluid milk and value-added products, employment generation, and a growing demand for milk and milk products. The industry also benefits from liberalized policies, large resources of unconventional feeds and fodders, diverse germ plasm, and animal production technologies for faster development and implementation. The industry also has an integrated marketing structure, improved contract data collection through agencies, and a market information intelligence system for milk and milk products. Additionally, software for project formulation for dairy enterprises is being developed.

**THREATS:** The dairy industry faces threats such as foreign product introduction, increasing chemical contaminants, poor microbiological quality, export of quality feed ingredients, molasses deficiency, excessive grazing pressure on marginal lands, and the extinction of indigenous cattle breeds due to crossbreeding programs. The liberalization of the industry is also likely to be exploited by multinationals, leading to milk shortages and adversely affecting consumers.

### 9.0 Milk Scenario: Karnataka

Karnataka has seen significant economic growth in the 11th Plan ending 2011-12, with the Gross State Domestic Product (GSDP) growing at 6.7%, with the services sector contributing the most at 8.7%. The industrial sector grew at 4.8%, and agriculture at 5.1%. The services sector is the largest contributor and key driver of the state's economy, with exports to GSDP at 48% in 2012-13. The orientation towards the services sector has influenced urbanisation, with the state becoming the 7th most urbanized in India. The state's population primarily lives in the eight districts of Bangalore, Belgaum, Mysore, Tumkur, Gulbarga, Bellary, Bijapur, and Dakshina Kannada. The state's population has declined faster than the birth rate, creating new demographic challenges and opportunities in 2023, the dairy market in Karnataka, primarily consisting of cow and buffalo milk, reached INR 1,069.1 Billion. The dairy industry in Karnataka was valued at INR 1,069.1 Billion in the same year. It is projected that the dairy industry in Karnataka will demonstrate a Compound Annual Growth Rate (CAGR) of 12.8% between 2024 and 2032. The transformation of the dairy industry into a structured sector, coupled with the rising consumption of various value-added dairy products like cheese, probiotic drinks, and yogurt, is a key factor propelling the dairy industry in Karnataka. The dairy industry in Karnataka can be categorized based on product type into liquid milk, ghee, curd, paneer, ice-cream, table butter, skimmed milk powder, frozen/flavored yogurt, fresh cream, lassi, Liquid milk is the leading product in the dairy industry, followed by buttermilk, cheese, flavored milk, UHT milk, dairy whitener, sweet condensed milk, infant food, and malt-based beverages. Key players in Karnataka's dairy sector are Karnataka Milk Federation, Tirumala Dairy, Dodla Dairy, and Heritage Dairy.

**Success Story of kmf Nandini**, a brand founded in 1974 by the Karnataka Milk Federation (KMF), is a legacy of quality and community upliftment in Karnataka. With over 1,500 members, KMF has a diverse range of products, including pasteurised and toned milk, ghee and paneer, chocolates, and authentic Mysore Pak. The brand has been championed by icons like Rajkumar, who passed on the trust to his son, Puneeth Rajkumar, and actress Shriya Saran, who brought Nandini Good Life Products to neighboring states. The company's growth story is evident in its net worth, which has grown from Rs 8.82 crore in 1976-77 to Rs 14,018 crore in 2022-23. With a net worth nearing Rs 21,000 crore, Nandini is the country's second-largest cooperative and represents the pride of Karnataka. As it continues to pour love into every glass, it looks forward to a shimmering future ahead

## 10. Conclusion:

The Dairy sector has become a crucial pillar of the rural economy in India over the last few decades. Nevertheless, due to the high price sensitivity of milk and milk products, the dairy sector has become exceptionally susceptible within the rural economy. After the implementation of Operation Flood, numerous rural households in India shifted their focus to the dairy and animal husbandry sectors as their primary source of income. India has held the title of the largest milk-producing nation globally for approximately 25 years, doubling its milk production in the past two decades. The dairy industry has played a significant role in boosting India's rural economy. This sector serves as a prime example of success within the country's agricultural landscape. By combining traditional farming techniques, government assistance, and technological advancements, the industry has reached new heights.. The animal husbandry and dairying sectors have seen significant growth over the past years, and their progress was impressive, although challenges remain, the industry's resilience and adaptability suggest a positive outlook for its continuous growth. Present study monitors the latest dairy market updates, it is evident that the Indian dairy industry is not only meeting current demands but also preparing for a prosperous future.

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