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Milk Production, Availability and its Role in Human Health

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ABSTRACT

Dairy farming constitutes a cornerstone of India's rural economy, offering livelihood support to millions and contributing significantly to the nation's nutritional security and GDP. India is endowed with the largest livestock population in the world. Milk production and dairy farming as a subsidiary occupation to agriculture have been given immense importance as dairy farming not only gives employment opportunities but also act as a catalyst to improves the dietary supplement of the family and provides a steady income to a large number of people to both the rural and urban poor of the country. This study aims to provide a comprehensive state-wise assessment of the dairy sector, focusing on key indicators such as milk production, productivity, per capita milk availability and institutional linkages. This paper reviews the evolution of the dairy sector in India. It also provides policy recommendations for ensuring sustainable growth of the sector in the coming decade. The findings reveal that states such as Uttar Pradesh, Rajasthan, Madhya Pradesh, Gujarat, Maharashtra, Punjab, Andhra Pradesh, Karnataka, Bihar and Haryana consistently lead in total milk production. These State contributes about 82% of total milk production in the country.

Keywords: Dairy Farming, Growth Rate, Milk Production, Per capita milk availability, Health, Nutrients

INTRODUCTION

The livestock sector is key strength of India's rural economy, ensuring nutritional security and providing sustainable income to millions. India 's global standing in this sector is remarkable, ranking First in milk, second in egg and fourth in meat production. Milk plays a crucial role in promoting healthy lifestyles. Milk is nature's ideal food. Milk is an important food of diet of vast population on earth as well as Milk is universally recognized as a complete diet due to its high nutritional value for human beings. Milk is an important source of protein, fat, carbohydrates, vitamins and minerals. India's per capita milk availability has increased to 471 grams per day in 2023-24, from 130 grams per day in 1950-51. Dairy sector is instrumental in bringing socio-economic transformation in India. It has created a lot of employment opportunities and also provides improved nutritional benefits. Milk production has increased significantly from 17 million Tones in 1950-51 to 239.3 million Tones in 2023-24. The per capita availability of milk in India is much higher than the world average.

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OBJECTIVES

This study aims to provide a comprehensive state-wise assessment of the dairy sector, focusing on key indicators such as milk production, productivity and institutional linkages. Secondary data is used for the study. This data was collected from various reports, journals, articles, publications and Recherch articles available on various websites and other internet sources. The following Statistical Techniques have been used:

Least Square Method for developing a linear model

We have estimated simple growth rate and compound growth using the following:

$$G = \frac{(y_t - y_0)}{y_0} * 100$$

Compound growth rate R= $$R = \left[\left\{ \frac{y_t}{y_0} \right\}^{\frac{1}{n}} - 1 \right] * 100$$

Projection based on Simple Growth Rate

$$y_t = y_0(1 + ng),$$

Where y_0 is an initial year

y_t is the projection year

n is number of years from base year

and g is simple proportionate growth rate

RESULT & DISCUSSIONS

The livestock production plays an integral part of rural economy. The dairy sector assumes a great deal of significance for India on various accounts. The sector is an important job provider, especially for women, and plays a leading role in women's empowerment. **Table-A** present the human population, milk production and per capita milk availability from 2001-02 to 2023-24. It is seen that human population has been increased from 1040 million in 2001-02 to 1388 million in 2023-24. The milk production has been increased from the level of 84.4 M tones in 2001-02 to 239.3 4 M tones in 2023-24. Similarly per capita milk availability has also been increased to 471 gm/day in 2023-24 from 222 gm/day in 2001-02.

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Table-A. All India Human Population, Milk Production and Per Capita Milk availability during 2001-02 to 2023-24

Year	Human Population (Million nos.)	Growth rate Population	Milk Production (Million tonnes)	Growth rate Milk	Per Capita Availability (gram. /day)	Growth rate Availability
2001-02	1040		84.4		222	
2002-03	1056	1.54	86.2	2.13	224	0.90
2003-04	1072	1.52	88.1	2.20	225	0.45
2004-05	1089	1.59	92.5	4.99	233	3.56
2005-06	1106	1.56	97.1	4.97	241	3.43
2006-07	1122	1.45	102.6	5.66	251	4.15
2007-08	1138	1.43	107.9	5.17	260	3.59
2008-09	1154	1.41	112.2	3.99	266	2.31
2009-10	1170	1.39	116.4	3.74	273	2.63
2010-11	1186	1.37	121.8	4.64	281	2.93
2011-12	1211	2.11	127.9	5.01	289	2.85
2012-13	1227	1.32	132.4	3.52	296	2.42
2013-14	1243	1.30	137.7	4.00	303	2.36
2014-15	1,258	1.21	146.3	6.25	319	5.28
2015-16	1,275	1.35	155.5	6.29	333	4.39
2016-17	1,291	1.25	165.4	6.37	351	5.41
2017-18	1,306	1.16	176.3	6.59	370	5.41
2018-19	1,320	1.07	187.7	6.47	390	5.41
2019-20	1,334	1.06	198.4	5.70	406	4.10
2020-21	1,349	1.12	210	5.85	427	5.17
2021-22	1,363	1.04	221.1	5.29	446	4.45
2022-23	1,376	0.95	230.6	4.30	459	2.91
2023-24	1,388	0.87	239.3	3.77	471	2.61
Total	**28074**		**3337.8**		**7364**	
Average	**1220.61**		**145.12**		**320.17**	

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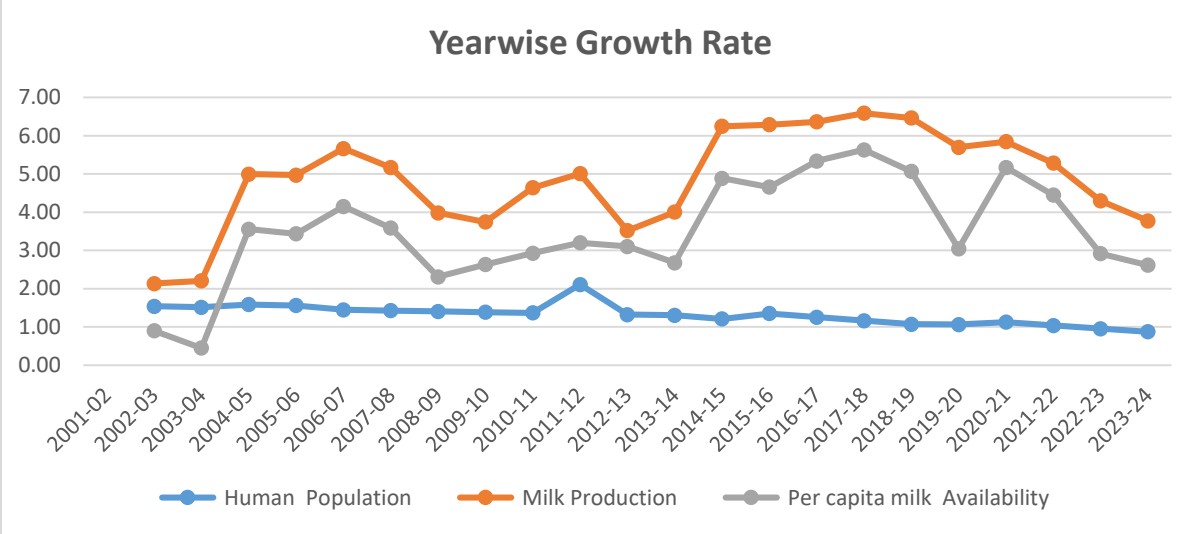

Table-B. Indian has achieved incredible feat in milk production. India has ranked first in Global milk production. Present the major milk producing state during 2023-24. It is observed that Uttar Pradesh contribution has been 15.65% of the total production of 248 M tones, followed by Rajasthan (14.82%), Madhya Pradesh (9.12%), Gujarat (7.78%), Maharashtra (6.71%) %), Punjab (6.00%) Andhra Pradesh (5.63%), Karnataka (5.61%), Bihar (5.41%) and Haryana (5.08%). These State contributes about 82% of total milk production in the country.

Table-B. Milk Production in Major States during 2023-24

States	Production (000 Tones)	%age Share	Cumulative %age Share
Andhra Pradesh	13994	5.85	5.85
Bihar	12853	5.37	11.22
Gujarat	18312	7.65	18.87
Haryana	12220	5.11	23.98
Karnataka	13463	5.63	29.60
Madhya Pradesh	21326	8.91	38.52
Maharashtra	16045	6.71	45.22
Punjab	14000	5.85	51.07
Rajasthan	34733	14.51	65.59
Uttar Pradesh	38780	16.21	81.79
Others	43573	18.21	100.00
ALL INDIA	239299	100.00	

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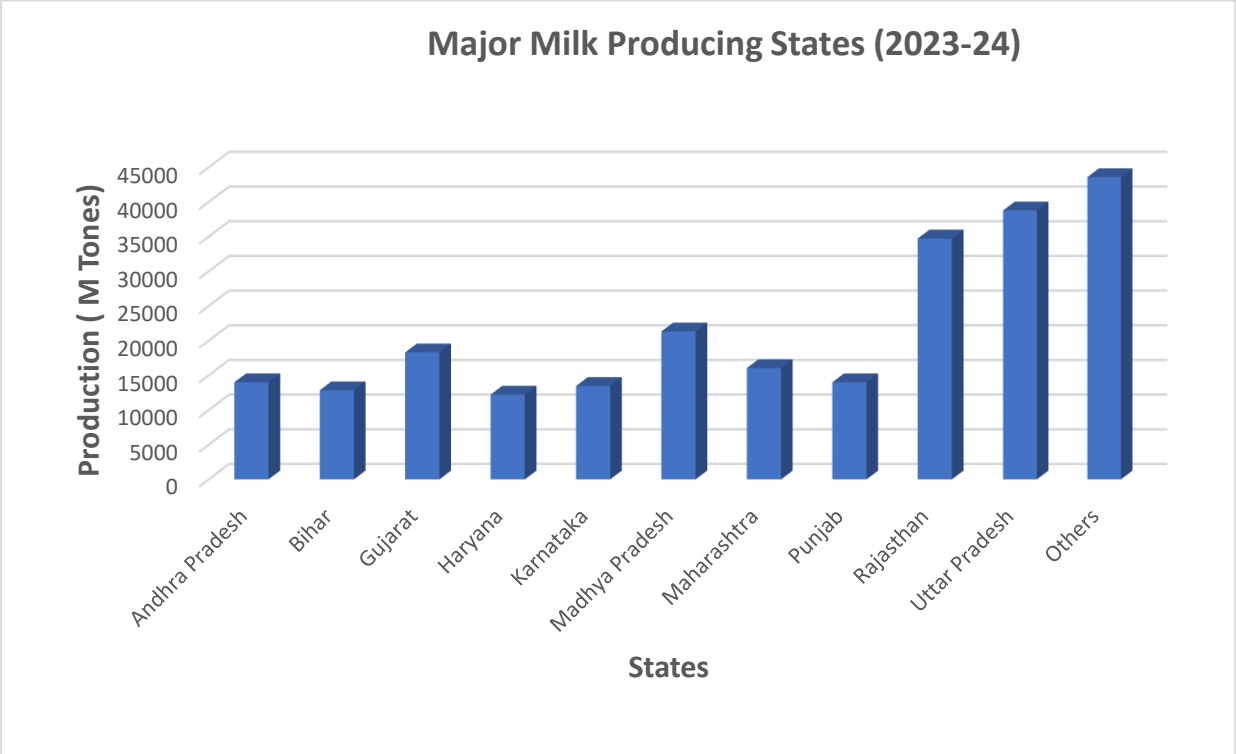

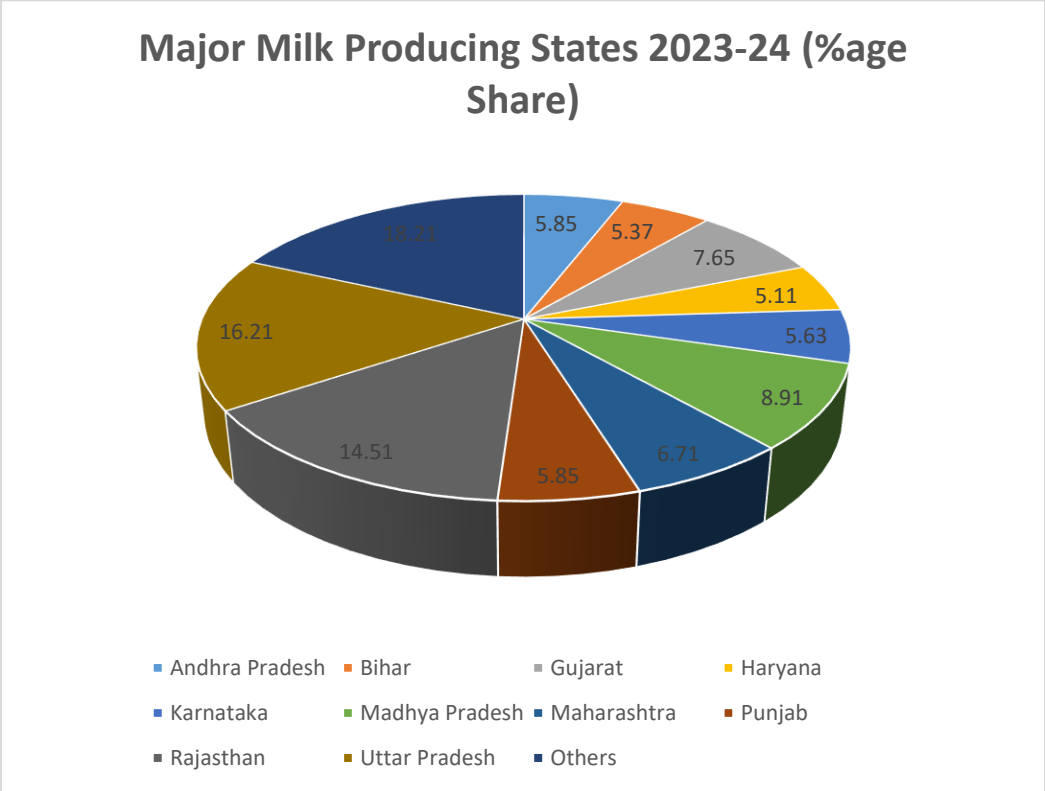

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Table C Projected Population, Milk production and per capita availability of milk

Table-C presents the projected population, milk production and per capita availability of milk for 2028-29 and 2033-34. The least square model has been used for projection. It is seen that the estimated population will be 1479 million in 2028-29 and 1561 million in 2033-34. The Milk production will be 254 M tones in 2028-29 and 287 M tones in 2033-34. The per capita milk availability will be 495 gm/day and 547 gm/day for 2028-29 and 2033-34 respectively.

Nutritional value of Milk

The nutritional richness of milk is unquestionable; it is a good source of high biological value proteins with polyvalent roles in immune function, as well as nutrient transport and absorption and important vitamins and essential minerals. Even though the nutritional benefits of milk can differ because of its type. The standard nutrients 100 ml of milk contains:

Concluding Remarks

Milk is an ideal food for all ages of people. Milk is excellent source of protein, lipids, essential vitamins and minerals. Milk is a good source of protein with a high biological value that plays an important role in immune function and nutrient transport and absorption. A review of dairy development in the country presents encouraging trends in terms of milk production, per capita availability of milk, sources of milk production and also accessibility of milk. However, in order to meet the challenges ahead, it calls for an integration of interventions at the level of farmers associating nutrition, health, reproduction and management.

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