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Egg Production, Availability and its Importance in Human Health

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ABSTRACT

The livestock sector is one of the fastest-growing agricultural sectors in India. Livestock are domesticated animals raised in agriculture to provide labour forces and commodities like milk, eggs, meat, fur, leather, and wool. The livestock sector is critical to the country's socio-economic growth and national economy. Poultry is a significant livestock activity that contributes to food security because eggs and chicken meat are important and rich sources of protein, vitamins, and minerals. India ‘s global standing in this sector is remarkable, ranking First in milk, second in egg and fourth in meat production. Eggs are a significant food source, providing essential nutrients such as high-quality protein, vitamins, minerals, unsaturated fatty acids, choline, and carotenoids, which highlight their potential health benefits in a balanced diet. This study aims to provide a comprehensive state-wise assessment of the poultry sector, focusing on key indicators such as Egg production, productivity, per capita Egg availability and institutional linkages. The present study focuses on the estimation of Simple Growth Rate and Compound Growth Rate for the data on egg production and its per capita availability of eggs by fitting linear and exponential functions at all India data. The findings reveal that states such as Andhra Pradesh, Tamil Nadu, Telangana and West Bengal consistently lead in total Egg production. These State contributes about 58% of total Egg production in the country.

Keywords: Livestock, Poultry, Growth Rate, Linear Programming, Egg Production, Per Capita Availability, Simple Growth Rate, Compound Growth Rate, Nutrients

INTRODUCTION

The livestock sector is critical to the country's socio-economic growth and national economy. Poultry is a significant livestock activity that contributes to food security because eggs and chicken meat are important and rich sources of protein, vitamins, and minerals. Poultry farming is one of the most dynamic and profitable sectors of the agricultural industry in India. With increasing demand for chicken meat and eggs across rural and urban populations, poultry farming has become a reliable source of income for farmers, entrepreneurs, and agribusinesses. Eggs are one of the best sources of high-quality protein along with important vitamins and minerals. An increased egg production and consumption could significantly improve nutritional needs of adults and children. Eggs are also an economical source of nutrients for a healthy diet and life, playing a vital role in human nutrition. Egg production has increased significantly from 1832 million numbers in 1950-51 to138376 million Numbers in 2022-23. India’s per capita Egg availability has also increased exponentially to 101 number per annum in 2022-23, from 5 number per annum in 1950-51.

OBJECTIVE

- To analyze the total Egg production on a state-wise basis, and compare their patterns
- To evaluate the per capita Egg Availability
- Benefits of Egg in Human Heath
- To identify performance gaps and scope for improvement and policy support

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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

$$y = a + bx$$

Where y is milk production
a is constant
b is regression of *y* on *x*, and x is years

This method has been applied for actual value and 3 years moving averages. The moving averages have been estimated using the following formula:

$$y_{i+1} = \frac{(y_i + y_{i+1} + y_{i+2})}{3}$$

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. Poultry is one of the most widespread food industries worldwide Eggs are a staple in diets all around the world, providing essential nutrients and protein for millions of people. With the growing demand for eggs, it is important to take a look at the top egg-producing countries in the world**.** India is the third largest egg-producing country in the world. The country has a large and growing population, leading to a high demand for eggs. India also has a large number of small-scale egg producers, contributing to its high egg production numbers. Table-1 presents the three yearly moving averages of Egg production, per capita availability along with human population.. It is observed that there is an increasing trend in Egg production. The Egg production has been increased from the level of 11707 M Nos in 1982-23 to 136916 M Nos in 2022-23. The growth rate has been highest at the level of 9.67 % per annum during 1982-83 to 1992-93 and lowest 7.22% during 1992-93 to 2002-03. It is also seen that there is increasing trend for per capita Egg availability. It has been increased to 100 Nos per annum in 2022-23 from 18 Nos per annum during 1982-83. The highest growth rate was observed during 2012-13 to 2022-23 (7.54%). The Human Population is also having positive trends during all the periods.

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Table -1 Three years moving average of Egg production, per capita Egg availability, Human Population

Year.	Egg Production M Nos	Growth rate per annum	Per capita Egg availability Nos per annum	Growth rate per annum	Population Million	Growth rate per annum
1982-83	11707		18		708	
1992-93	23026	9.67	26	4.44	873	2.33
2002-03	39652	7.22	38	4.62	1056	2.10
2012-13	70311	7.73	57	5.00	1227	1.62
2022-23	136916	9.47	100	7.54	1376	1.21

Table-A present the human population, Foodgrains Production, Egg production and per capita Egg availability from 2000-01 to 2022-23. It is seen that human population has been increased from 1019 million in 2000-01 to 1376 million in 2022-23. The Foodgrains production has been increased from the level of 196.81 M tones in 2000-01 to 329.69 4 M tones in 2022-23. Similarly, the Egg production has been increased from the level of 36632 M Nos in 2000-01 to 138376 M Nos in 2022-23. The per capita Egg availability has also been increased to 101 Nos per annum in 2022-23 from 36 Nos per annum in 2000-01.

Table-2. All India Human Population, Egg Production and Per Capita Egg availability during 2000-01 to 2022-23

Year	Human Population (Million nos.)	Growth rate Population	Foodgrains Production (Million tonnes)	Growth rate Foodgrains	Egg Production (Million Nos)	Growth rate Egg Production	Per Capita Availability (Nos/Annum)	Growth rate Egg Availability
2000-01	1019		196.81		36632		36	
2001-02	1040	2.06	212.85	8.15	38729	5.72	37	2.78
2002-03	1056	1.54	174.77	-17.89	39823	2.82	38	2.70
2003-04	1072	1.52	213.19	21.98	40403	1.46	38	0.00
2004-05	1089	1.59	198.36	-6.96	45201	11.88	42	10.53
2005-06	1106	1.56	208.6	5.16	46235	2.29	42	0.00
2006-07	1122	1.45	217.28	4.16	50663	9.58	45	7.14
2007-08	1138	1.43	230.78	6.21	53583	5.76	47	4.44
2008-09	1154	1.41	234.47	1.60	55562	3.69	48	2.13
2009-10	1170	1.39	218.09	-6.99	60267	8.47	51	6.25
2010-11	1186	1.37	244.48	12.10	63024	4.57	53	3.92
2011-12	1211	2.11	259.29	6.06	66450	5.44	55	3.77
2012-13	1227	1.32	257.12	-0.84	69731	4.94	57	3.64
2013-14	1243	1.30	265.05	3.08	74752	7.20	60	5.26
2014-15	1,258	1.21	252.03	-4.91	78484	4.99	62	3.33
2015-16	1,275	1.35	251.54	-0.19	82929	5.66	65	4.84
2016-17	1,291	1.25	275.11	9.37	88139	6.28	68	4.62
2017-18	1,306	1.16	285.01	3.60	95217	8.03	73	7.35
2018-19	1,320	1.07	285.21	0.07	103804	9.02	79	8.22
2019-20	1,334	1.06	297.5	4.31	114383	10.19	86	8.86
2020-21	1,349	1.12	310.74	4.45	122049	6.70	90	4.65
2021-22	1,363	1.04	315.62	1.57	129600	6.19	95	5.56
2022-23	1,376	0.95	329.69	4.46	138376	6.77	101	6.32
Total	**27705.00**		**5733.59**		**1694036.00**			
Average	**1204.57**		**249.29**		**73653.74**			

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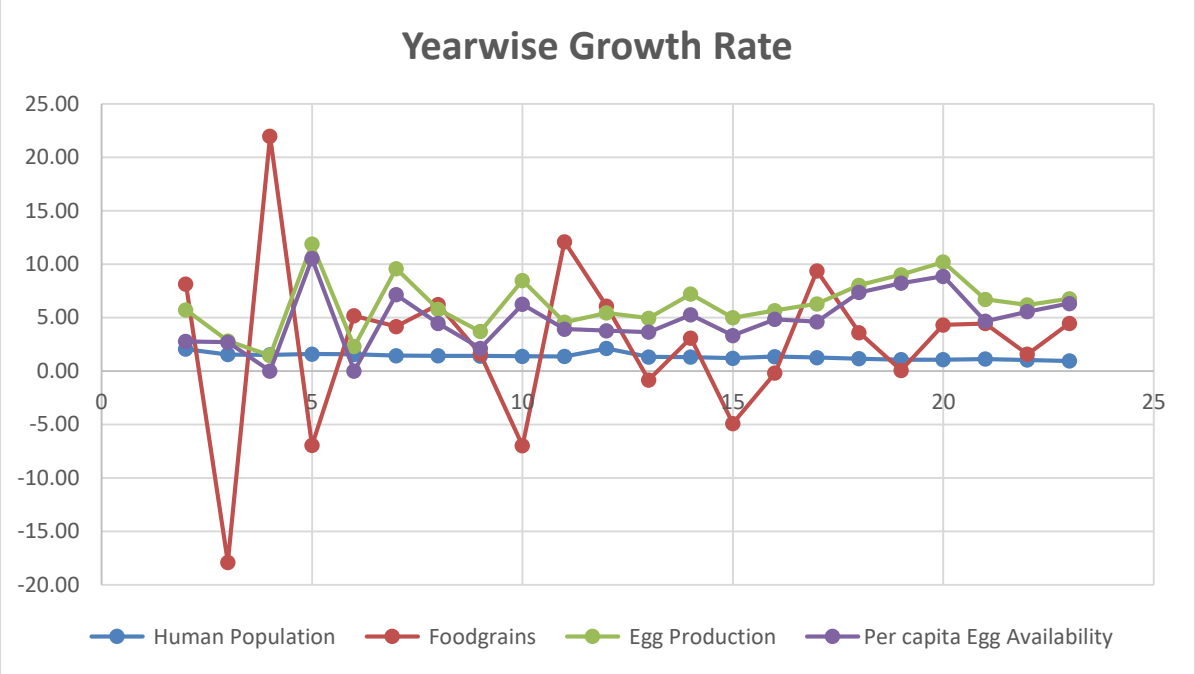

Table-3. Indian has achieved incredible growth in Egg production. India has ranked third in Global Egg production. Table Present the major Egg producing state during 2022-23. It is observed that Andhra Pradesh contributes around 20% the total production of the country, followed by Tamil Nadu (15.58%) Telangana (12.77%) and West Bengal (9.94%). These State contributes about 58% of total milk production in the country.

Table-3. Egg Production in Major States during 2022-23

States	Production (Lakhs Nos)	%age Share	Cumulative %age Share
Andhra Pradesh	278498	20.13	20.13
Haryana	81806	5.91	26.04
Karnataka	90087	6.51	32.55
Maharashtra	73843	5.34	37.88
Odisha	34108	2.46	40.35
Punjab	62603	4.52	44.87
Tamil Nadu	215607	15.58	60.45
Telangana	176706	12.77	73.22
Uttar Pradesh	45585	3.29	76.52
West Bengal	137541	9.94	86.46
Others	187379	13.54	100.00
ALL INDIA	1383763	100.00	

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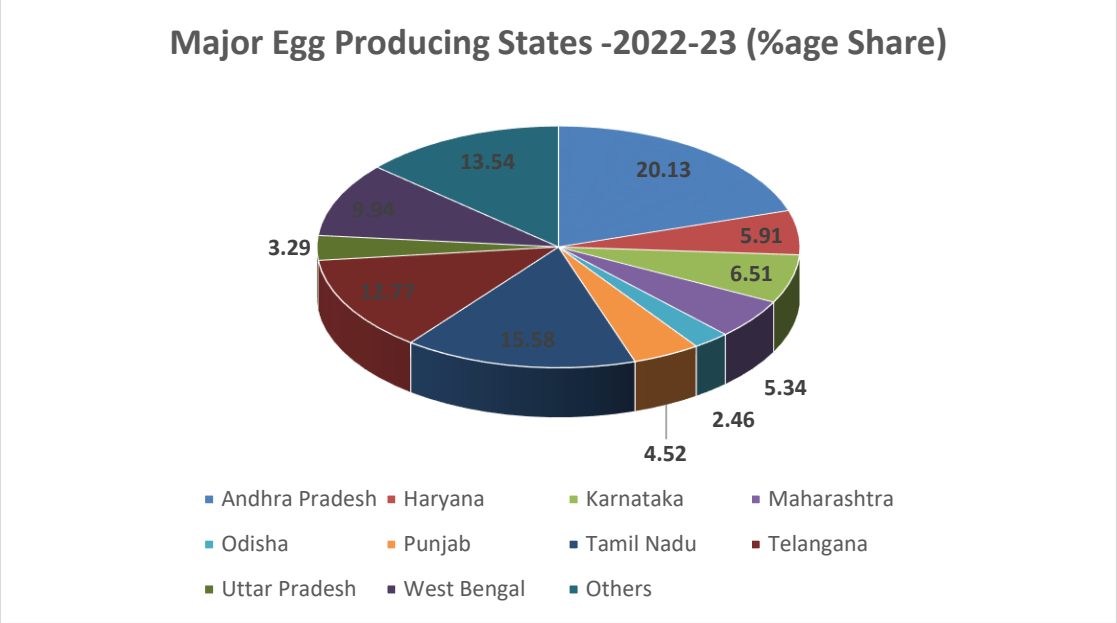

Table 4 Projected Population, Foodgrains, Egg production and per capita Egg availability

	2027-28	2032-33
Human Population (Million)	1468	1551
Foodgrains Production (M Tones)	349	379
Egg Production (M Nos)	143980	164859
Per Capita Egg availability (Nos/Annum)	104	118

Table-4 presents the projected population, Foodgrains Production, Egg production and per capita availability of Egg for 2027-28 and 2032-33. The least square model has been used for projection. It is seen that the estimated population will be 1468 million in 2027-28 and 1551 million in 2032-33. The Foodgrains production will be of the order of 349 M tones in 2027-28 and 379 M tones in 2032-33. The Egg production has been estimated 143980 M Nos in 2027-28 and 164859 M Nos in 2032-33. The per capita Egg availability has been assessed 104 Nos per annum and 118 Nos per annum during 2027-28 and 2032-33 respectively.

Nutritional value of Egg

A single large boiled egg contains:

- Vitamin A: 8% of the DV (Daily Value)
- Folate: 6% of the DV
- Pantothenic acid (vitamin B5): 14% of the DV
- Vitamin B12: 23% of the DV
- Riboflavin (vitamin B2): 20% of the DV
- Phosphorus: 7% of the DV
- Selenium: 28% of the DV
- Eggs also contain decent amounts of vitamin D, vitamin E, vitamin B6, calcium and zinc
- This comes with 78 calories, 6 grams of protein, and 5 grams of fat.

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CONCLUDING NOTE

Eggs are one of the best sources of high-quality protein along with important vitamins and minerals. An increased egg production and consumption could significantly improve nutritional needs of adults and children. Eggs are also an economical source of nutrients for a healthy diet and life, playing a vital role in human nutrition. A review of poultry in the country presents encouraging trends in terms of Egg production, per capita Egg availability and also accessibility of milk. It is essential to educate families with limited resources about the affordability of eggs, their potential to provide necessary nutrients and their health benefits for growing children and infants. The expansion of the poultry sector worldwide will provide enormous benefits to the diet, well-being, and socioeconomic development of poor people. However, in order to meet the challenges for growing human population ahead, there is a need for an integration of interventions at the level of farmers associating nutrition, health, reproduction and management.

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