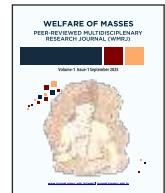




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Statistical Analysis of Milk Production of State Government of Maharashtra

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ABSTRACT

Every Government department has an Official Statistics, even then the Government does not provide the data. Maharashtra is 307,713 square kilometers (118,809 square miles) in area, making it the third largest state in India by land area. It covers 9.36% of India's total geographical area. Livestock of Maharashtra is one of the main sources of livelihood. Maharashtra's dairy sector has seen substantial growth in milk production, with a notable increase in 2017-18 to 2021-22. Maharashtra ranks fifth among India's top milk-producing states, contributing significantly to the nation's dairy output. In 2021-22, the state's total milk production reached 14,300 thousand tonnes. The dairy sector is vital for Maharashtra, with a large percentage of cattle owned by small and marginal farmers, providing both employment and a source of income. Milk production is also an important part of livestock products. Milk production plays a prominent role for protein in routine life.. In this project we analyze milk production of Maharashtra State by using Descriptive Statistics.

Introduction

The study considers livestock production in Maharashtra. The maximum number of total contributions of livestock products at current prices of total value in the agriculture department[1-2]. In the food supply chain, animal production plays a very important role. Animals are mostly related to the rural area person because it is not only economically profitable [3-4] but also needs animal products for health. Milk production mostly depends on six factors. First factor is land size and family size of livestock farmers.[5-6]

The second factor is the number of different types of milky animals. Third factor is which types of fodder are available and how many fodders are fed by cattlemen.[7-8] Fourth factor is how many check-ups are available for milky animal's health and vaccinations of animals from time to time. Fifth factor is which type of breeding method the animal keeper uses. Sixth factor is how much knowledge and training is gained by the stock farmer about milky. Maharashtra, a major Indian state, heavily relies on dairy farming, which is a crucial part of its rural economy. In this research paper analysis of milk production in the year 2017-18 to 2021-22. Here describe yearly variation of milk production by using basic statistics terms. The state has a large number of dairy cooperative societies, indicating a well-established dairy infrastructure. Ahmednagar is identified as the largest milk-producing district in Maharashtra.[9-11]

This research paper aims to explore information about milk

production in Maharashtra state and also how to improve the quality of milk production.

Objectives of the Study:

1. To find out the trend of milk production and yearly variation in livestock census.
2. To find out which year represents maximum milk production by using Simple bar diagram.
3. To represent the percentage of milk production within five years by using pie diagrams.
4. To find out the compound annual growth rate of per capita availability of milk.
5. To provide suggestions for improvement of milk Production.

Table 1. Data Of Milk Production In Maharashtra (duration 2017-2022)

District name	Estimates of Milk Production ('000 Tonnes) from 2017-18 to 2021-22				
	2017-18	2018-19	2019-20	2020-21	2021-22
Ahmednagar	1827.3	1976.3	1452.96	2077.82	2198.1
Akola	81.76	77.55	106.82	93.28	95.15
Amravati	179.38	181.46	139.33	193.04	198.2
Aurangabad	282.64	281.42	510.71	331.82	345.25

Estimates of Milk Production ('000 Tonnes) from 2017-18 to 2021-22					
District name	2017-18	2018-19	2019-20	2020-21	2021-22
Beed	360.95	347.59	266.39	345.96	356.91
Bhandara	99.78	85.27	82.71	130.31	135.58
Buldhana	165.4	149.68	101.76	176.29	180.74
Chandrapur	67.54	66.43	110.66	66.66	68.4
Dhule	142.82	156.21	69.97	193.46	201.87
Gadchiroli	42.26	43.37	345.96	43.9	44.95
Gondia	53.76	55.59	53.36	93.18	96.18
Hingoli	76.97	82.37	71.61	94.29	96.4
Jalgaon	317.46	371.05	144.37	461.65	478.86
Jalna	115.09	105.54	272.17	156.82	161.97
Kolhapur	1000.34	1045.7	149.48	1167.25	1219.92
Latur	243.59	240.01	1015.64	295.17	303.09
Mumbai	78.46	82.65	283.21	20.83	20.86
Nagpur	167.23	161.84	148.2	173.54	179.71
Nanded	245.3	241.3	281.24	283.33	290.61
Nandurbar	89.19	97.21	121.45	89.75	92.96
Nashik	601.89	737.19	515.59	839.54	878.94
Osmanabad	327.37	296.21	286.74	452.95	476.67
Palghar	133.42	136.43	152.82	121.9	125.67
Parbhani	113.71	109.51	118.33	127.74	130.87
Pune	1282.08	1397.64	1639.48	1768.55	1862.09
Raigad	74.21	75.45	79.08	94.89	97.36
Ratnagiri	63.57	63.29	65.7	63.99	67.2
Sangli	713.86	787.92	794.14	1062.73	1109.15
Satara	661.27	740.16	976.4	822.92	865
Sindhudurg	44.86	45.9	52.39	41.71	42.65
Solapur	982.55	988.68	1209.62	1418.17	1474.79
Thane	143.16	146.2	122.33	121.41	124.66
Wardha	89.55	81.25	104.19	86.68	90.41
Washim	84.81	76.67	54.4	64.47	64.03
Yavatmal	148.76	124.44	125.04	127.32	129.3
Maharashtra	11102.29	11655.46	12024.26	13703.32	14304.51
Yavatmal	148.76	124.44	125.04	127.32	129.3
Maharashtra	11102.29	11655.46	12024.26	13703.32	14304.51

As per the National Cooperative Database (NCD) of the Ministry of Cooperation, the total number of functional dairy cooperative societies is 11,219 (NCD accessed on 27.07.2023). The district-wise milk production in the State of Maharashtra during the last five years.

Result and analysis:

Milk production is produced on a very large scale in Maharashtra. The bar diagram effectively highlights the uneven distribution of milk production across Maharashtra. It also serves as a tool for policymakers and stakeholders to identify regions where dairy development programs can be intensified. By investing in low-performing areas and reinforcing successful models in high-performing districts, for the five years the overall milk production in the state can be enhanced. Total Milk Production in Maharashtra stood at 11102.29 thousand tonnes in 2017-18, 2018-19 the total milk production in Maharashtra state stood at 11655.46 thousand tonnes, 2019-

20 the total milk production in Maharashtra state stood 12024.26 thousand tonnes, 2020-21 that is 13703.32 thousand tonnes milk production in Maharashtra state, also in the year of 2021-22 the total milk production stood at 14304.51 thousand tonnes in Maharashtra state.

A pie chart was used to analyze the proportional contribution of yearly to the total milk production in Maharashtra. In year 2017-18 there was 17.7% milk production in Maharashtra state, In year 2018-19 there was 18.6% milk production in Maharashtra state, In year 2019-20 milk production had 19.2%, in year 2020-21 milk production in Maharashtra state was 21.8% in year 2021-22 has increased in percentage of milk production that was 22.8%, also by using descriptive statistics analysis to find variation in milk production of Maharashtra state.

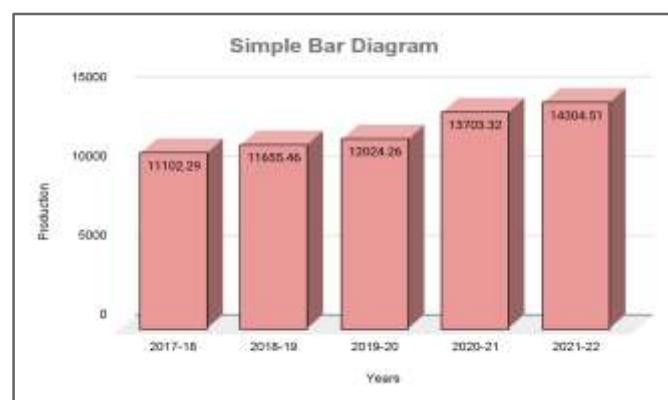


Fig. 1: Milk production in thousand tons in Maharashtra. 2017-2022

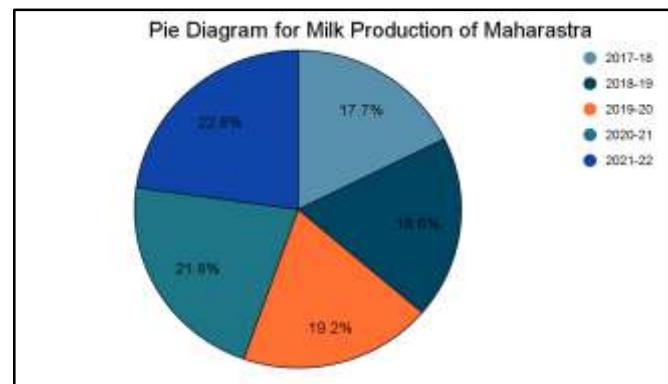


Fig. 2: Percentage (to check proportion) of Milk production in thousand tons in Maharashtra. 2017-2022

Statistical Analysis of Milk Production for future planning with special reference to Maharashtra state

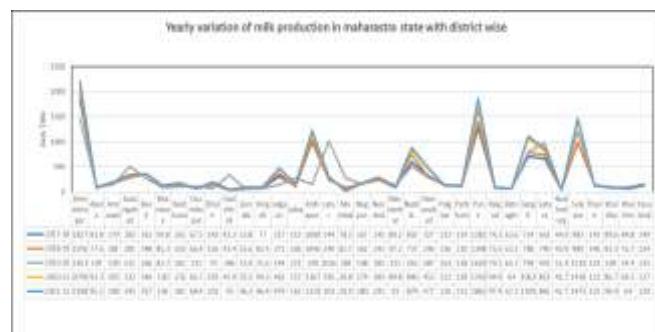


Fig. 3: Yearly variation of milk production in maharashtra state with district wise The line chart illustrates the trend in milk production over a specified time period, providing a visual representation of fluctuations and growth patterns In above diagram representation of highly milk production & lower milk production district wise. Here Ahmednagar, Kolhapur, Pune & Solapur district have highly milk production rate, Gadchiroli, Gondiya Wardha & Washim have lowest milk production rate.

Table 2: Descriptive analysis of milk production of Maharashtra state.

Mean	358.7990857
Standard Error	35.09426605
Median	146.2
Mode	345.96
Standard Deviation	464.2535021
Sample Variance	215531.3142
Kurtosis	3.806131337
Skewness	2.083612896
Range	2177.27

This is the average milk production value across the data points. It indicates the central tendency, but may not fully represent the dataset due to high skewness. Since the median (146.20) is much lower than the mean (358.80), it suggests a right-skewed distribution—some large values are pulling the average upwards. The most frequently occurring value i.e. Mode is closer to the mean indicating many values lie around this point, although extreme values are influencing the average. Standard deviation indicates large variability in milk production of Maharashtra state. Sample variances confirm high data dispersion. This could happen if some districts have very high milk production due to dairy cooperatives, industrial dairies, or better infrastructure.

CONCLUSION:

The study is conducted by the secondary data of animal husbandry. In Maharashtra State, the milk production is rapidly increasing every year. The highest milk-producing district in Maharashtra is Ahmednagar & Kolhapur. Milk production data is uneven, with most areas having average output, but a few places or times having much higher production. This means overall numbers are skewed by these high outliers. Those studying this should focus on what makes these high producers stand out to learn from their success. This analysis concludes

that there is high variability in the given data. In this analysis, Gadchiroli, Gondia Wardha & Washim have the lowest milk production rate & also conclude that milk production of Maharashtra state has increased every year. In the analysis basis conclude that in years 2017-18 have minimum milk production & year 2021-22 have highest milk production in maharashtra state. Statistical analysis shows the proportion between every year.

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