

**PRODUCTION PRACTICES OF MILK IN KERALA WITH SPECIAL REFERENCE TO  
KOTTAYAM DISTRICT**

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**ABSTRACT**

*The paper examines the progress of dairy industry in India in general and Kerala in particular. The study also highlights the various aspects of production of milk at Kottayam district in Kerala. In order to accomplish the objectives both primary and secondary data were used. Primary data were collected from 60 dairy farmers from Kottayam district in Kerala under judgement sampling. Secondary data were collected from various published and unpublished books. The study found that there has been an increasing trends in the production of milk in India. Utter Pradesh is the largest producer of the milk in India (30,519 thousand tonnes in 2018-19). Punjab stands firsts in the per capita availability of milk in India with 1181(gms/day) in 2018-19 followed by Haryana, Rajasthan, Gujarat, and Andhra Pradesh.*

*The production of the milk in Kerala was extremely low. There was a diminishing trend in the production of milk in the state. The highest production was 2718 thousand tonnes in the year 2001-02. Since then it was diminishing and in 2018-19 it was 2,548 thousand tonnes which was very low as compared to other states in India. The per capita availability of the milk in Kerala was very low. There were many problems facing by the milk producers such as inadequate feed and fodder, low productivity of the cross breed animals, limited availability of health services and poor dairy management practices. Among these, low productivity is a serious problem. Government should implement various measures for establishing a veterinary service centres to enhance the competence of artificial insemination scheme and the veterinary services should be administered to the farmer door on all bases at an acceptable cost. The dairy farmers should be supported by providing subsidized credit for calf rearing and feeding the cattle during dry seasons so that the production and the productivity would increase.*

**Key words**

*Cross bred Cow, Buffalo, Livestock, Cattle, Co-operative Milk Society*

**INTRODUCTION**

Milk is the primary source of nutrition including protein and lactose. Dairy farming is considered to be a whole environment of reciprocal relations and dependency, re-production and protection of social values. Hence, dairy farms typically consist of high producing dairy cows. Other species used in commercial dairy farming includes goat, sheep, and camel. There are over 264 million dairy cows worldwide, producing nearly 600 million tonnes of milk every year. The global average for milk production is approximately 2,200 litres per cow. India is the largest producer of milk followed by the United States of America, Pakistan, China, Brazil etc.

According to the UN's Food and Agriculture Organization (FAO) India produced 22% of the world milk production of 843 million tonnes in the year 2018. There is an increasing trends in the production of milk by 5% over 2017 in India but in the European Union it was only 1%. This growth is

expected to sustain in the coming years, the Niti Aayog says India will produce 300 million tonnes of milk by 2022 (An IBM Business, The Times of India).

India's biggest milk-producing states, according to 2017-18 data from the National Dairy Development Board, are Uttar Pradesh, Rajasthan, Madhya Pradesh, Andhra Pradesh and Gujarat. Dairy industry is one of the main industries in India which is considered as the source of livelihood and economic engine of the country. Demand for dairy products in India is likely to grow significantly in the coming years, driven by more consumers, higher incomes and greater interest in nutrition. Consumption of processed and packaged dairy products is increasing in urban areas. Because of the increasing competition from the private sector, several national and international brands have entered the market and expanded consumers' expectation of quality although only among a small proportion of the population. The dairy industry in Kerala is not very impressive because of consistent low production and low per Capita availability of Milk. The production of milk in Kerala was 2,548 thousand tonnes in 2018-19 which was very low when compared with the largest milk producing states in India like Uttar Pradesh 30,519 thousand tonnes, Madhya Pradesh 15,911 thousand tonnes and so on. There has been decreasing trends in the productivity of milk which is considered as one of the serious problems in the dairy industry in Kerala. The per capita availability of Milk in Kerala was 189 (gm/day) in 2018-19 and in Haryana per capita availability of milk 1087(gm/day), which is ten times higher than Kerala (National Development Board). Along with this, there are many other problems such as shortage of feed/fodder, breeding system, education and training, hygiene conditions, marketing and pricing. Among these problems, low productivity is a serious problem affecting the dairy industry in Kerala.

## OBJECTIVES

1. To examine the progress of Dairy Industry in India in general and in Kerala in particular.
2. To highlight the various aspects of production of milk at Kottayam district in Kerala.

## STATEMENT OF THE PROBLEM

The Indian dairying is the endeavour of small holders. The marginal producers and small holders, who account for about 78% of all land holdings, constitute the core milk production sector. They own over 60% of all milch animals (74% of the crossbred milch animals, Kurup (2002). In recent years, with the increasing premiumization and diversification of consumer needs, the uses of milk have been expanding from traditional dairy products to new products with high added value. The quality of milch animals are critical factors in determining the milk productivity and hence overall production. Currently, low productivity per animal hinders development of the dairy sector. Despite being the world's largest milk producer, India's productivity per animal is very low, at 987 kg per lactation, compared with the global average of 2,038 kg per lactation (Meeta Punjabi). Indian dairy industry is facing many problems such as inadequacy and unavailability of livestock health care, lack of scientific livestock feeding practice, improper milk marketing facilities and uncertain price of milk for producers, lack of veterinary and extension services, lack of milk production standards and clean milk production practices. Among these problems low productivity of milch animals is a serious problem which adversely affect the Indian dairy industry. The per capita availability of Milk in Kerala was 189 (gm/day) in 2018-19 which was extremely low and in Haryana per capita availability of Milk 1087(gm/day), which is ten times higher than the Kerala (National Development Board). The productivity gap is very large between Kerala and other milk producing states in India.

## LITERATURE REVIEW

Asha Kumari (2012) low yield/productivity of milch animals was a serious problem which affected the overall profitability of dairy farming. The majority of the milk producer possessed crossbred milch animals because the average production of milk per day per producer was high. The study found that the

yield per animal per day is influenced by human labour cost per animal per day, value of green fodder per animal per day, value of concentrates fed per animal per day and length of lactation period. Among these, green fodder was very important because it was found in the study that one per cent increase in value of green fodder per day per animal could increase 0.3852 per cent increase in yield of milk per day per animal. The study focused on the importance of the co-operative societies in rural areas for the socio and economic development.

Deshmukh (2014) a tremendous change had taken place in Indian dairy industry after the delicensing of dairy industry under Industrial Development and Regulation Act (IRDA-1951) and promulgation of milk and milk products order (MMPO-1992) through which the milk union in different states in India had increased their liquid milk collection and helped in enlarging their business. 80 percent of the milk produced by the rural producer is controlled by an unorganized sector and only 20 percent is controlled by organized sector. The study highlighted the dairy co-operation was very important in reducing rural poverty. There is a wide interstate and interregional differences in terms of per capita availability of milk. One of the serious problems affecting in the dairy industry was low productivity of milch animals.

Greeshma Greeshmam (2015) the demand of milk in Kerala was high because the per capita availability of milk was very low and the per capita consumption of milk was very high. Due to this gap, Kerala imported milk from other states of India. The consequence of higher import decreased the quality of the milk the state. During the period of 2006-2011, five milk dairies were banned in Kerala because of low quality of milk. The Dairy Development Department of Kerala is concentrating for strengthening the dairy sector farming through numerous schemes and programmes to fulfil the demand and supply gap like, the Intensive Dairy Development Programme, Strengthening Infrastructure for Quality & Clean Milk Production, Assistance to Cooperatives and Dairy Entrepreneurship Development Scheme. The Milk Shed Development Programme implemented by the department during 1999 to 2001 at Oachira and Karunagappally blocks have helped to increase fodder as well as milk production in the area.

## METHODOLOGY OF THE STUDY

Both primary and secondary data were used in the study. Primary data was randomly collected from sixty dairy farmers. Judgement sampling method was used in the study. Primary data was obtained from the milk producing farmers who owned more than three milch animals by using a structured interview schedule regarding the various aspects of production of milk in Kottayam. The basic statistical tools such as percentage, growth rate, variation, bar diagrams and charts were used for the economic analysis.

Secondary data were collected from various published and unpublished books. Published data such as Milma annual report, records, journals, government books. Unpublished includes diaries, biographies, private individuals etc.

## INDIAN DAIRY INDUSTRY

India ranks first among the world's milk producing nations since 1998 and has the largest bovine population in the World. Milk production in India during the period 1950-51 to 2017-18, has increased from 17 million tonnes to 176.4 million tonnes as compared to 165.4 million tonnes during 2016-17 recording a growth of 6.65 %. FAO reported 1.46% increase in world milk Production from 800.2 million tonnes in 2016 to 811.9 (Estim) million tonnes in 2017. The per capita availability of milk in the country was 130 gram per day during 1950-51 has increased to 374 gram per day in 2017-18 as against the world estimated average consumption of 294 grams per day during 2017. This represents sustained growth in the availability of milk and milk products for our growing population (Department of Animal Husbandry and dairying).

**TOP FIVE MILK PRODUCING COUNTRIES IN THE WORLD 2017**  
(Including cow/buffalo/goat/sheep/camel milk)

Table 1

| RANK | COUNTRY       | POPULATION<br>(1000TONNES/YEAR) | SHARE IN GLOBAL<br>PRODUCTION |
|------|---------------|---------------------------------|-------------------------------|
|      | WORLD         | 827,884                         | 100%                          |
| 1    | INDIA         | 176,272                         | 21.29%                        |
| 2    | UNITED STATES | 97,760                          | 11.81%                        |
| 3    | PAKISTHAN     | 44,293                          | 5.35%                         |
| 4    | CHINA         | 34,869                          | 4.21%                         |
| 5    | BRAZIL        | 33,742                          | 4.08%                         |

Source: Dairy Farming, FOA Statistics, [https://en.wikipedia.org/wiki/Dairy\\_farming](https://en.wikipedia.org/wiki/Dairy_farming)

Table 1 shows that India stands first in the production of milk in the world. It produces 176,272 thousand tonnes of milk in 2017 and contributed 21.29% of the share to the world. United States rank second with 97,760 thousand tonnes of milk followed by Pakistan (44,293 thousand tonnes), China (34,869 thousand tonnes) and Brazil (33,742 thousand tonnes).

#### STRENGTHENING THE INDIAN DAIRY SECTOR

India requires to overwhelm a few important problem in dairy industry. The dairy industry is governed by a plethora of Acts and regulations, e.g. the Agricultural Produce (Grading and Marketing) Act, 1937 as amended in (AGMARK); Prevention of Food Adulteration Act, 1954; Export (Quality Control and Inspection) Act, 1963. The contribution of dairy sector to agriculture GDP has fallen from around 17.80 percent in 2007-08 to 16.95 percent in 2008 -09 at constant price (1999-2000). There is a big opportunities for the development of livestock expansion in the era of liberalization. Demand for livestock products is on the ascent in response to rising per capita income and changing tastes and preferences. On the other hand the scope of annual rate of 4 to 7 percent of growth in trade of livestock of different output in the supply side of the dairy industry.

#### MILK PRODUCTION AND PER CAPITA AVAILABILITY OF MILK IN INDIA

Table 2.

| Year    | Production<br>(Million tonnes) | Per Capita<br>Availability<br>(gms/day) |
|---------|--------------------------------|-----------------------------------------|
| 1991-92 | 55.6                           | 178                                     |
| 1992-93 | 58.0                           | 182                                     |
| 1993-94 | 60.6                           | 186                                     |
| 1994-95 | 63.8                           | 192                                     |
| 1995-96 | 66.2                           | 195                                     |
| 1996-97 | 69.1                           | 200                                     |
| 1997-98 | 72.1                           | 205                                     |
| 1998-99 | 75.4                           | 210                                     |
| 1999-20 | 78.3                           | 214                                     |
| 2000-01 | 80.6                           | 217                                     |
| 2001-02 | 84.4                           | 222                                     |
| 2002-03 | 86.2                           | 224                                     |
| 2003-04 | 88.1                           | 225                                     |

|         |       |     |
|---------|-------|-----|
| 2004-05 | 92.5  | 233 |
| 2005-06 | 97.1  | 241 |
| 2006-07 | 102.6 | 251 |
| 2007-08 | 107.9 | 260 |
| 2008-09 | 112.2 | 266 |
| 2009-10 | 116.4 | 273 |
| 2010-11 | 121.8 | 281 |
| 2011-12 | 127.9 | 290 |
| 2012-13 | 132.4 | 299 |
| 2013-14 | 137.7 | 307 |
| 2014-15 | 146.3 | 322 |
| 2015-16 | 155.5 | 337 |
| 2016-17 | 165.4 | 355 |
| 2017-18 | 176.3 | 375 |
| 2018-19 | 187.7 | 394 |

Source: National Dairy Development Board (<https://www.nddb.coop/information/stats/milkprodindia>)

Figure 1

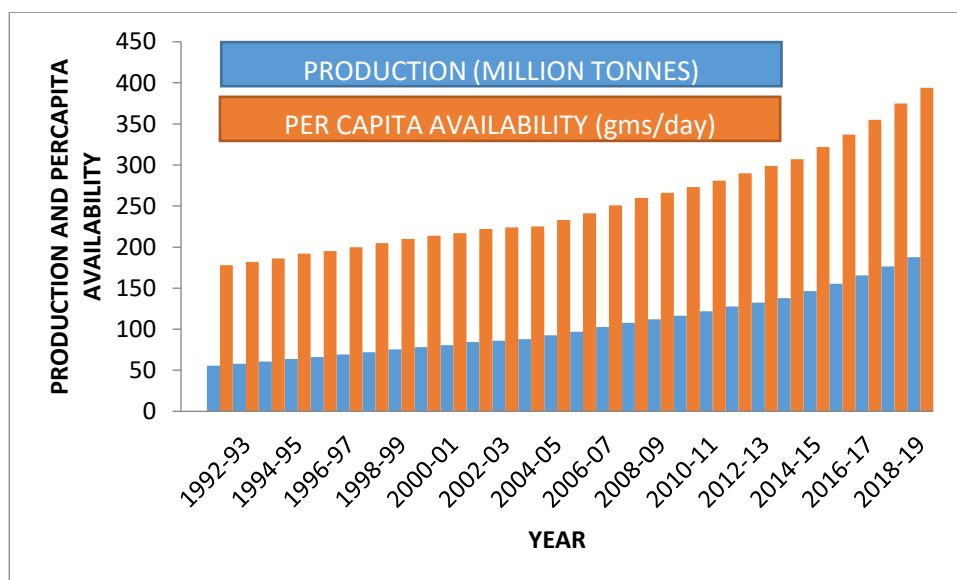


Table 2 shows that there has been an increasing trend in the production of milk. In the year 1991-92 it was 55.6 million tonnes which was doubled in the year 2006-07 to 102.6 million tonnes. There was a consistent increase in the production and the production rose to 187.7 million tonnes in 2018-19. The per capita availability of milk shows an impressive trend. In 1991-92 it was 178 (gm/day) and it doubled to 273 (gms/day) in the year 2009-10. In the year 2018-19 there has been three fold increase in the per capita availability by 394 (gms/day).

#### KEY ISSUES IN THE PRODUCTION OF MILK

Absence of quality control, low productivity of milch animals and shortages of monitoring mechanisms are the major concern across the supply chain.

##### a. Low Productivity of Milch Animals

In India the population of milch animals are largest as compare to other countries but the important problem concerning India is low average productivity of milk as compare to other milk producing countries.

## b. Enhancing Production Potential

Improve production potential of indigenous breeds of cattle such as Sahiwal, Gir, Rathi, and Kenkrej and breeds of buffalo such as Murrah, mahsana and Jaffarbadi through appropriate selection programmes. Increase in production and use of high quality feed appropriate to local conditions.

## c. Super Animal Care Facilities and Processes

Expand first aid coverage through village level societies, NGOs, etc. Vaccination of animals such as HS (Haemorrhagic septicemia), BQ (Black Quarter) and FMD (Foot and mouth disease) for protecting the milch animals from various diseases.

## d. Lack of Quality Control and Monitoring Mechanism

There is a strong correlation between the quality of raw milk and the quality of the processed product. However, there is a significant deterioration in milk quality from farm to factory. The deterioration takes place on two accounts - Infrastructure issues and Contamination, through equipment, time and lack of temperature controlling storage/transportation.

## TOP FIVE MILK PRODUCING STATES IN INDIA (000'tonnes)

Table 3

| STATE   | UTTER PRADESH | MADHYA PRADESH | ANDHRA PRADESH | GUJARAT | PUNJAB |
|---------|---------------|----------------|----------------|---------|--------|
| YEAR    |               |                |                |         |        |
| 2001-02 | 14,648        | 5,283          | 5,814          | 5,862   | 7,932  |
| 2002-03 | 15,288        | 5,343          | 6,584          | 6,089   | 8,173  |
| 2003-04 | 15,943        | 5,388          | 6,959          | 6,421   | 8,391  |
| 2004-05 | 16,512        | 5,506          | 7,257          | 6,745   | 8,554  |
| 2005-06 | 17,356        | 6,283          | 7,624          | 6,960   | 8,909  |
| 2006-07 | 18,094        | 6,374          | 7,938          | 7,533   | 9,168  |
| 2007-08 | 18,861        | 6,572          | 8,925          | 7,911   | 9,282  |
| 2008-09 | 19,537        | 6,855          | 9,570          | 8,386   | 9,387  |
| 2009-10 | 20,203        | 7,167          | 10,429         | 8,844   | 9,389  |
| 2010-11 | 21,031        | 7,514          | 11,203         | 9,321   | 9,423  |
| 2011-12 | 22,556        | 8,149          | 12,088         | 9,817   | 9,551  |
| 2012-13 | 23,330        | 8,838          | 12,762         | 10,315  | 9,724  |
| 2013-14 | 24,194        | 9,599          | 13,007         | 11,112  | 10,011 |
| 2014-15 | 25,198        | 10,779         | 9,656          | 11,691  | 10,351 |
| 2015-16 | 26,387        | 12,148         | 10,817         | 12,262  | 10,774 |
| 2016-17 | 27,770        | 13,445         | 12,178         | 12,784  | 11,282 |
| 2017-18 | 29,052        | 14,713         | 13,725         | 13,569  | 11,855 |
| 2018-19 | 30,519        | 15,911         | 15,044         | 14,493  | 12,599 |

Source: National Dairy Development Board (<https://www.nddb.coop/information/stats/milkprodindia>)

The table shows that the estimates of milk production of state and the union territory wise in India during the year 2001-02 to 2018-19. Utter Pradesh was the largest producer of the milk in India. In the year 2001-02 the production of the milk was 14,648 thousand tonnes which has shown two fold increase to 30,519 thousand tonnes in 2018-19. The state shows very impressive growth in the production of milk. The other states followed by utter Pradesh were Madhya Pradesh (15,911 thousand tonnes), Andhra Pradesh (15,044 thousand tonnes), Gujarat (14,493 thousand tonnes), Punjab (12,599 thousand tonnes) of production of milk in 2018-19.

There was an increasing trends in the production of milk by 5% over 2017 in India but in the European Union it was only 1%. This growth is expected to sustain in the coming years (An IBM Business,

The Times of India). There is a big opportunities for the development of livestock expansion in the era of liberalization. Demand for livestock products is on the ascent in response to rising per capita income and changing tastes and preferences. There has been an increasing trends in the production of milk. In the year 1991-92 it was 55.6 million tonnes which was doubled in the year 2006-07 to 102.6 million tonnes. There is a consistent increase in the production and the production rose to 187.7 million tonnes in 2018-19. The per capita availability of milk shows an impressive trend. In the year 2018-19 there has been threefold increase in the per capita availability by 394 (gms/day). Utter Pradesh is the largest producer of the milk in India. In the year 2001-02 the production of the milk was 14,648 thousand tonnes which has shown two fold increase to 30,519 thousand tonnes in 2018-19. The other states followed by utter Pradesh were Madhya Pradesh (15,911 thousand tonnes), Andhra Pradesh (15,044 thousand tonnes), Gujarat (14,493 thousand tonnes), Punjab (12,599 thousand tonnes).

### **MILK PRODUCTION IN KERALA**

Throughout the period of operational flood from 1981 there has been impressive rise in the production of milk in Kerala. Kerala achieved influential growth in milk production through cross breeding and co-operative milk marketing. In Kerala, the share of livestock in Gross State Value Added (GSVA) from Agriculture Sector is nearly 29 per cent. However, it has shown a marginal fall from 29.35 per cent in 2015-16 to 29.14 per cent in 2016-17. Though GSVA from the sector has increased in absolute numbers, its share in total GSVA of the State has also declined marginally from 3.18 per cent in 2015-16 to 3.08 per cent in 2016-17.(Economic Review 2017, State Planning Board, Thiruvananthapuram). Among the milk producing States in the country, Kerala ranks 14th, with a share of just 1.5 per cent of the total milk production in the country. The production of milk has declined from 26.49 lakh MT to 25.20 lakh MT in 2016-17. The per capita availability of milk in Kerala has been declining during the 12th Plan period. It decreased from 200 gm per day in 2015-16 to 189 gm per day in 2016-17 (which is just above half of the national average). The State of Kerala was covered by the Operation Flood programme with the objective to make available wholesome milk at reasonable price to the urban consumers through providing a large share of amount paid by the consumers to the rural producers. The Operation Flood also aimed at achieving self-sufficiency in milk production through economic wellbeing of the rural milk producers. Even after implementing the operation flood in the state of Kerala, the cattle population is coming down and the number of buffaloes in the state is also small in spite of the fact that cattle holding are considered as an asset which provides income for the household and which has high liquidity. Besides generation of household income, maintaining milch animals will improve the nutritional status of the household. The sale of calf gives an additional income.

Livestock sector contributed 27.62% of the Agriculture Gross Domestic Product (AGDP) of the state during 2014-15 (at constant price with base year 2011-12), while in 2013-14, the share was 25.25 percent recording a growth rate of 4.3 percent. In Kerala, 96 percent of the Agricultural holding fall below one hectare and nearly 94 percent of the livestock population is concentrated in rural areas. As a consequence, 80 percent of the livestock farmers are marginal farmers and agricultural labour households. As per the 19<sup>th</sup> livestock census 2012, Kerala had 12.11 lakh female cattle population and nearly 82% of cattle were crossbreeds. Milk production in the state during 2013-14 and 2014-15 as 26.55 lakh and 27.11 lakh MT respectively. During 2014-15, Kerala contributed only 1.85% to the annual milk production of the country (Economic Review, 2015. Government of Kerala).

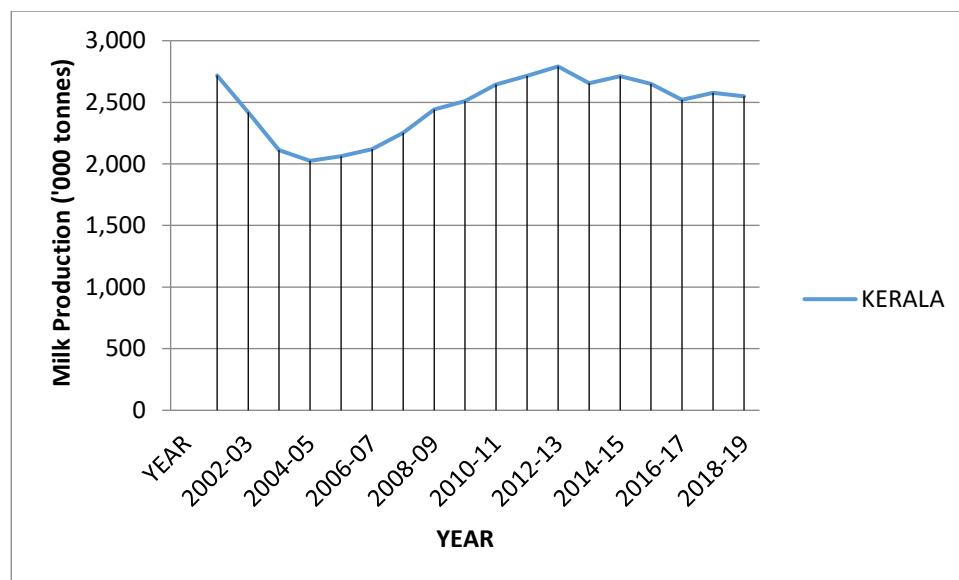
## MILK PRODUCTION ('000 TONNES) IN KERALA

Table 4

| STATE   | KERALA |
|---------|--------|
| YEAR    |        |
| 2001-02 | 2,718  |
| 2002-03 | 2,419  |
| 2003-04 | 2,111  |
| 2004-05 | 2,025  |
| 2005-06 | 2,063  |
| 2006-07 | 2,119  |
| 2007-08 | 2,253  |
| 2008-09 | 2,441  |
| 2009-10 | 2,509  |
| 2010-11 | 2,645  |
| 2011-12 | 2,716  |
| 2012-13 | 2,791  |
| 2013-14 | 2,655  |
| 2014-15 | 2,711  |
| 2015-16 | 2,650  |
| 2016-17 | 2,520  |
| 2017-18 | 2,576  |
| 2018-19 | 2,548  |

Source: National Dairy Development Board (<https://www.nddb.coop/information/stats/milkprodindia>)

Figure 2



The table 4 shows a diminishing trends in the production of milk. Since 2002-02 there was fluctuation in the production and it remained almost constant. The highest production was 2718 thousand tonnes in the year 2001-02. Since then it was diminishing and in 2018-19 it was 2,548 thousand tonnes which was very low as compare to other states in India. In 2018-19 the production of milk in other states like Utter Pradesh (30,519 thousand tonnes), Madhya Pradesh (15,911 thousand tonnes), Andhra Pradesh (15,044 thousand tonnes), Gujarat (14,493 thousand tonnes) and Punjab (12,599 thousand tonnes).



## COMPARISON BETWEEN KERALA AND OTHER LARGE MILK PRODUCING STATES IN INDIA

Production (tonnes) of top five largest milk producing states in India and Kerala

Table 5

| STATE   | UTTER PRADESH | MADHYA PRADESH | ANDHRA PRADESH | GUJARAT | PUNJAB | KERALA |
|---------|---------------|----------------|----------------|---------|--------|--------|
| YEAR    |               |                |                |         |        |        |
| 2001-02 | 14,648        | 5,283          | 5,814          | 5,862   | 7,932  | 2,718  |
| 2002-03 | 15,288        | 5,343          | 6,584          | 6,089   | 8,173  | 2,419  |
| 2003-04 | 15,943        | 5,388          | 6,959          | 6,421   | 8,391  | 2,111  |
| 2004-05 | 16,512        | 5,506          | 7,257          | 6,745   | 8,554  | 2,025  |
| 2005-06 | 17,356        | 6,283          | 7,624          | 6,960   | 8,909  | 2,063  |
| 2006-07 | 18,094        | 6,374          | 7,938          | 7,533   | 9,168  | 2,119  |
| 2007-08 | 18,861        | 6,572          | 8,925          | 7,911   | 9,282  | 2,253  |
| 2008-09 | 19,537        | 6,855          | 9,570          | 8,386   | 9,387  | 2,441  |
| 2009-10 | 20,203        | 7,167          | 10,429         | 8,844   | 9,389  | 2,509  |
| 2010-11 | 21,031        | 7,514          | 11,203         | 9,321   | 9,423  | 2,645  |
| 2011-12 | 22,556        | 8,149          | 12,088         | 9,817   | 9,551  | 2,716  |
| 2012-13 | 23,330        | 8,838          | 12,762         | 10,315  | 9,724  | 2,791  |
| 2013-14 | 24,194        | 9,599          | 13,007         | 11,112  | 10,011 | 2,655  |
| 2014-15 | 25,198        | 10,779         | 9,656          | 11,691  | 10,351 | 2,711  |
| 2015-16 | 26,387        | 12,148         | 10,817         | 12,262  | 10,774 | 2,650  |
| 2016-17 | 27,770        | 13,445         | 12,178         | 12,784  | 11,282 | 2,520  |
| 2017-18 | 29,052        | 14,713         | 13,725         | 13,569  | 11,855 | 2,576  |
| 2018-19 | 30,519        | 15,911         | 15,044         | 14,493  | 12,599 | 2,548  |

Source: National Dairy Development Board (<https://www.nddb.coop/information/stats/milkprodindia>)

Figure 3

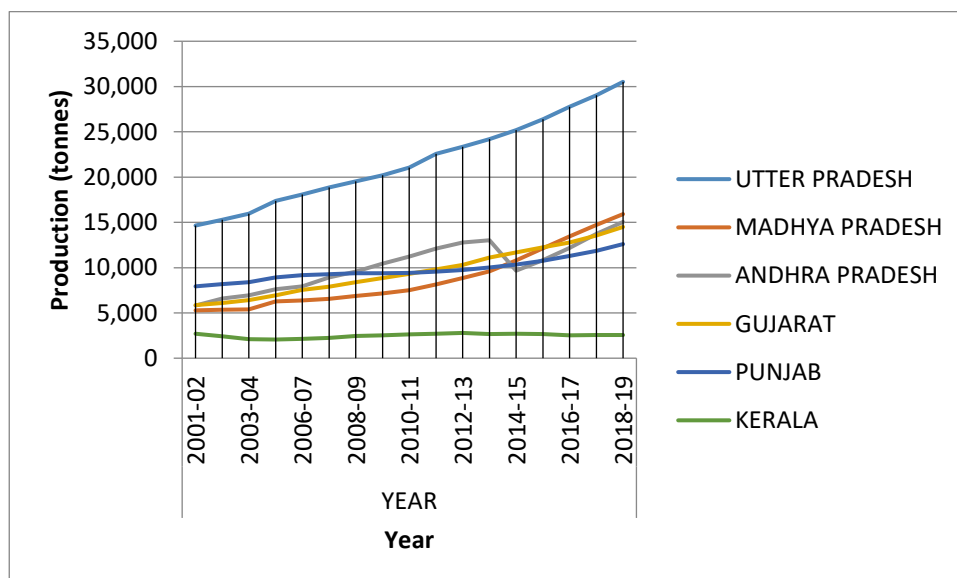


Table 5 Utter Pradesh, Madhya Pradesh, Andhra Pradesh, Gujarat and Punjab are the five largest milk producing states in India. The table 4 shows that the production of Kerala was extremely low as compared with these states. Since 2001-02 the production in these states shows an increasing trends but Kerala was in decreasing trend. In 2018-19 the production of Utter Pradesh was 30,519 thousand tonnes

and in Kerala it was 2,548 thousand tonnes. The gap is very large. The figure shows straight line since 2001-02 which shows a constant rate in the production of milk in Kerala

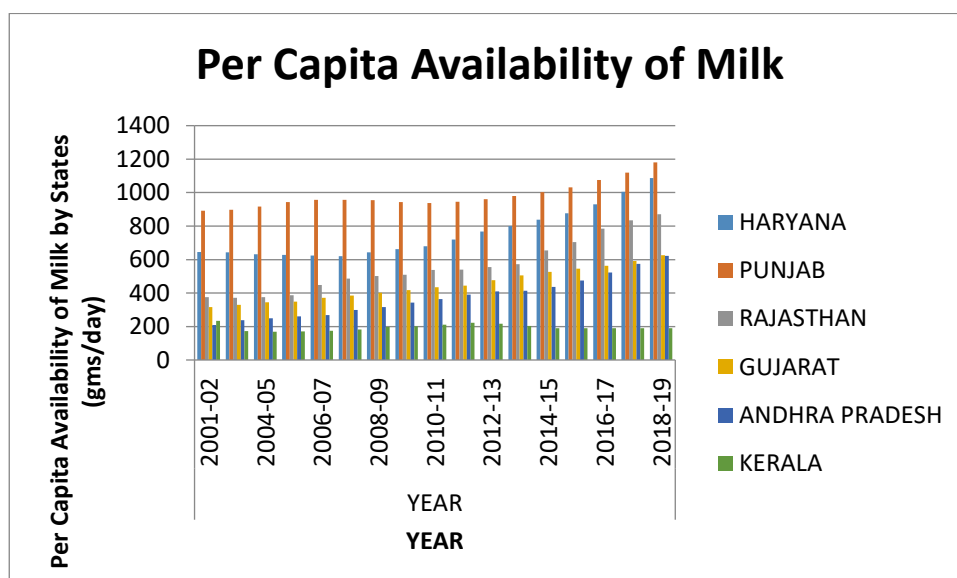
#### PER CAPITA AVAILABILITY OF MILK (GMS/DAY) OF LARGE MILK PRODUCING STATES IN INDIA WITH KERALA

Table 6

| STATE   | PUNJAB | HARYANA | RAJASTHAN | GUJARAT | ANDHRA PRADESH | KERALA |
|---------|--------|---------|-----------|---------|----------------|--------|
| YEAR    |        |         |           |         |                |        |
| 2001-02 | 892    | 645     | 376       | 317     | 209            | 234    |
| 2002-03 | 895    | 647     | 368       | 321     | 231            | 203    |
| 2003-04 | 898    | 643     | 371       | 330     | 238            | 173    |
| 2004-05 | 917    | 631     | 376       | 344     | 250            | 169    |
| 2005-06 | 943    | 628     | 387       | 349     | 260            | 171    |
| 2006-07 | 957    | 624     | 449       | 372     | 268            | 174    |
| 2007-08 | 956    | 621     | 486       | 385     | 298            | 183    |
| 2008-09 | 955    | 644     | 501       | 402     | 316            | 197    |
| 2009-10 | 944    | 662     | 509       | 418     | 342            | 201    |
| 2010-11 | 937    | 679     | 538       | 435     | 364            | 210    |
| 2011-12 | 945    | 720     | 539       | 445     | 391            | 223    |
| 2012-13 | 961    | 767     | 555       | 476     | 409            | 216    |
| 2013-14 | 980    | 800     | 572       | 506     | 413            | 203    |
| 2014-15 | 1003   | 839     | 655       | 527     | 436            | 206    |
| 2015-16 | 1032   | 877     | 704       | 545     | 475            | 200    |
| 2016-17 | 1075   | 930     | 785       | 563     | 522            | 189    |
| 2017-18 | 1120   | 1005    | 834       | 592     | 574            | 192    |
| 2018-19 | 1181   | 1087    | 870       | 626     | 623            | 189    |

Source: National Dairy Development Board (<https://www.nddb.coop/information/stats/milkprodindia>)

Figure 4



Per capita availability of milk which determines the productivity of the milk. Punjab stands first in the per capita availability of milk in India with 1181(gms/day) in 2018-19 followed by Haryana, Rajasthan, Gujarat, and Andhra Pradesh. The per capita availability of milk in Kerala was extremely lower when compared with these states. It was 189 (gms/day) in 2018-19. Since 2001-02 the per capita availability of milk in these states were increasing while in Kerala per capita availability of milk has been diminishing. In 2001-01 it was 234 (gms/day) which has been decreased to 289 (gms/day) in 2018-19.

As per the 19<sup>th</sup> livestock census 2012, Kerala had 12.11 lakh female cattle population and nearly 82% of cattle were crossbreeds. Milk production in the state during 2013-14 and 2014-15 as 26.55 lakh and 27.11 lakh MT respectively. During 2014-15, Kerala contributed only 1.85% to the annual milk production of the country (Economic Review, 2015. Government of Kerala). Even after implementing the operation flood in the state of Kerala, the cattle population is coming down and the number of buffaloes in the state is also small in spite of the fact that cattle holding are considered an asset which provides income for the household and which has high liquidity. There is diminishing rate in the production of milk in Kerala. Since 2001-02 there was fluctuation in the production and it remained almost constant. The highest production was 2718 thousand tonnes in the year 2001-02. Since then it was diminishing and in 2018-19 it was 2,548 thousand tonnes which was very low as compared to other states in India. The production gap is very large between Kerala and other milk producing states in India. In 2018-19 the production of Uttar Pradesh (30,519 thousand tonnes), Madhya Pradesh (15,911 thousand tonnes), Andhra Pradesh (15,044 thousand tonnes), Gujarat (14,493 thousand tonnes) and Punjab (12,599 thousand tonnes) and in Kerala its production was 2,548 thousand tonnes. Punjab stands first in the per capita availability of milk in India with 1181(gms/day) in 2018-19 followed by Haryana, Rajasthan, Gujarat, and Andhra Pradesh. The per capita availability of milk in Kerala was extremely lower when compared with these states. It was 189 (gms/day) 2018-19.

### **PRODUCTION OF MILK IN KOTTAYAM DISTRICT**

In order to protect the interests of milk producers and consumers, there are co-operative milk producers' union covering all the districts in Kerala. The milk production and its quality depends upon the attitude of milk producers towards the services rendered by the co-operatives for the welfare of milk producers. There are three Regional Cooperative Milk Producers' Unions operating at present. The revenue districts of Thiruvananthapuram, Kollam, Alappuzha and Pathanamthitta come under the jurisdiction of the Thiruvananthapuram Regional Cooperative Milk Producers' Union (TRCMPU), the districts of Ernakulam, Thrissur, Kottayam and Idukki under the Ernakulam Regional Cooperative Milk Producers' Union (ERCMPU) and the six northern districts of Palakkad, Kannur, Malappuram, Kozhikode, Wayanad and Kasaragod under the Malabar Regional Cooperative Milk Producers Union (MRCMPU). Kottayam Dairy is located at Vadavathoor, Kottayam. The Dairy was commissioned in 1970 with a milk handling capacity of 6000/day and was expanded to 30000 litres/day in 2002 and is currently handling 75000 litres / day. Cooperative societies, a group of dairy farmers come together and are assisted by the government to set up a society. Each district has an average of 100 societies, which could each comprise 200 to 2,000 dairy farmers. The farmers bring their produce to the societies, where it is measured in terms of quantity and quality, and this data is recorded on a daily basis. Earlier, their process involved manually entering data into registers, ledgers, schedules and forms. This caused a lot of difficulty in verifying and tracking the status of each activity, and settling accounts with dairy farmers and customers.

## PROFILE OF MILCH ANIMALS

Table 7

| Sl.No | Profile Factor               | Number of Respondents | Percentage |
|-------|------------------------------|-----------------------|------------|
| 1     | Types of milch animals       |                       |            |
|       | Cow                          | 16                    | 26.6       |
|       | Buffalo                      | 04                    | 06.8       |
|       | Cross bred cow               | 40                    | 66.6       |
| 2     | Number of milch animals      |                       |            |
|       | Below 3                      | 5                     | 08.4       |
|       | 3-5                          | 47                    | 78.3       |
|       | Above 5                      | 08                    | 13.3       |
| 3     | Investments in milch animals |                       |            |
|       | Below Rs.10,000              | 14                    | 23.3       |
|       | Rs.10,000 – Rs.15,000        | 30                    | 50         |
|       | Above Rs.15,000              | 16                    | 26.7       |

Source: Primary data

The table shows that the majority of the milk producer in Kottayam district rear cow and the rest buffalo. 78.3 percent of the producers owned 3-5 milch animals and only 13.3 percent own above 5 milch animals. The size of investment in milch animals by most of the respondents (50 per cent) ranges from Rs.10, 000 to Rs.15, 000.

## FACTORS CONSIDERED FOR SELECTING MILCH ANIMALS

Number of respondents considering each factor

Table 8

| Sl. No | Factors       | Number of Respondents considering each factor | Percentage |
|--------|---------------|-----------------------------------------------|------------|
| 1      | Age of calves | 54                                            | 90.00      |
| 2      | Quality breed | 49                                            | 81.7       |
| 3      | Appearance    | 60                                            | 100        |
| 4      | Teads         | 44                                            | 73.03      |
| 5      | Gait          | 48                                            | 80.00      |
| 6      | Ears          | 46                                            | 76.07      |
| 7      | Eyes          | 45                                            | 75.00      |
| 8      | Mouth         | 52                                            | 87.07      |
| 9      | Appetite      | 44                                            | 73.03      |
| 10     | Rumination    | 34                                            | 66.07      |
| 11     | Flank         | 40                                            | 66.07      |
| 12     | Udder         | 53                                            | 88.03      |
| 13     | Milking       | 48                                            | 80.00      |
| 14     | Milk vein     | 46                                            | 77.00      |
| 15     | Teats         | 40                                            | 66.07      |
| 16     | Dung          | 38                                            | 63.03      |
| 17     | Urine         | 25                                            | 41.07      |

Source: Primary data.

Table 8 reveals that all the respondents consider appearance of milch animal as an important factor before buying it. About 88.03 per cent of respondents consider udder as an important factor, followed by age of calves and quality breed with 90 per cent and 81.07 per cent of respondents.

#### AVERAGE YIELD OF MILK PER DAY PER ANIMAL

Table 9

| Sl. No. | Type of Milch Animal | Average Yield / Day / Animal (litres) |
|---------|----------------------|---------------------------------------|
| 1       | Cow                  | 12                                    |
| 2       | Cross bred           | 16                                    |
| 3       | Buffalo              | 10                                    |

Source: Primary data.

There are various factors which determines the production and level of milk such as breed, milking time and the climate. The above table shows that the cross bred animals' produces the highest yield of milk per day. The highest yield of milk per day with 16 litres and the average yield from cow and buffalo stands second with 12 litres and 10 litres per day respectively.

#### PRODUCTION OF MILK PER DAY

Average production of milk per day per respondent

Table 10

| Sl. No. | Production      | Number of Respondents | Percentage |
|---------|-----------------|-----------------------|------------|
| 1       | Below 5 litres  | 3                     | 05.00      |
| 2       | 5 – 10 litres   | 32                    | 53.03      |
| 3       | 11 – 15 litres  | 18                    | 30.00      |
| 4       | Above 15 litres | 7                     | 11.07      |
|         | Total           | 60                    | 100        |

Source: Primary data.

Table 10 shows that the majority of the respondents (53.03) get an average of 5-10 litres of milk per day. Only five percent of respondents gets less than five litres of milk. 11 percent of the respondents are getting more than 25 litres of milk in average.

#### FEEDING OF MILCH ANIMALS

Fodder feeding is one of the important factors in the dairy animal management. 2/3 of proportionate feeding of green and 1/3 of dry fodders are essential for maintaining good health status of an animals. Small pieces of green fodder without cutting them into small pieces, the animals consumes only the leaves and thin steams, which creates the devastation of fodder waste. By using chaff cutter the green fodder and dry fodder can be fed proportionately.

## FAVORABLE FACTORS FOR DETERMING CATTLE FEED

Favourable factors

Table 11

| Sl. No. | Factors considered                    | Number of Respondents considering each factor | Percentage |
|---------|---------------------------------------|-----------------------------------------------|------------|
| 1       | Cheaper rate                          | 52                                            | 86.07      |
| 2       | Freshness                             | 47                                            | 78.03      |
| 3       | Taste                                 | 30                                            | 50.00      |
| 4       | Protein content                       | 34                                            | 57.00      |
| 5       | Ingredient for increasing fat content | 38                                            | 63.03      |
| 6       | Availability in sufficient quantity   | 48                                            | 80.00      |
| 7       | Credit availability                   | 50                                            | 83.03      |
| 8       | Local availability                    | 50                                            | 83.03      |

Source: Primary data.

The table 11 shows that the majority of the respondents (86.07) consider cheaper rate is the important factor in selecting the cattle feed followed by credit availability and local availability which are considered (among other factors) by 50 per cent of respondents respectively.

## SOURCES OF PURCHASE OF CATTLE FEED

Table 12

| Sl. No. | Source              | Number of Respondents | Percentage |
|---------|---------------------|-----------------------|------------|
| 1       | Private Institution | 07                    | 12.00      |
| 2       | Co-operatives       | 20                    | 33.00      |
| 3       | Market              | 23                    | 38.00      |
| 4       | Own Products        | 10                    | 17.00      |
|         | Total               | 60                    | 100        |

Source: Primary data.

Table 12, shows that the majority (38 %) of the respondent's purchases cattle feed from the market. 33 percent of the respondents depends on co-operatives for cattle feed. Only 12 percent of the respondents depends on private institutions.

## VACCINATION

The various types of vaccination for diseases in milch animals

Table 13

| Sl. No. | Disease                | Number of Respondents Vaccinating Animals | Percentage |
|---------|------------------------|-------------------------------------------|------------|
| 1       | Anthrat (Adappam)      | 35                                        | 58.33      |
| 2       | Foot and Mouth Disease | 45                                        | 75.00      |
| 3       | Render Pest (Vekkai)   | 40                                        | 67.00      |

|   |                                           |    |       |
|---|-------------------------------------------|----|-------|
| 4 | Haemorrhagic Septicemia (Thondai adappan) | 38 | 63.33 |
| 5 | Cow Pox                                   | 28 | 47.00 |
| 6 | Tuberculosis (Elumburiki Noyi)            | 35 | 58.33 |

Source: Primary data.

The table reveals that the vaccination of foot and mouth disease (75%) and render pest (67%) are comparatively higher than the other vaccination. Nearly fifty percentage of the respondents are take almost every vaccination for their milch animals.

According to the study conducted at Kottayam district in Kerala the majority of the milk producer in Kottayam district rear cow and the rest buffalo. There are many factors for selecting the milch animals such as appearance, age of calves, udder, milking, quality breed and gait. Among these factors appearance is the main factor considering for selecting the milch animals. The study found that the cross bred animals' produces the highest yield of milk per day. The highest yield of milk per day with 16 litres and the average yield from cow and buffalo stands second with 12 litres and 10 litres per day respectively. The average production of milk per day was 5-10 litres. Chaff cutter has been using by the milk producer so that the green fodder and dry fodder can be fed proportionately without wasting. The majority of the milk producers consider cheaper rate is an important factor in selecting the cattle feed followed by credit availability and local availability. The majority the milk producers purchase cattle feed from the market. While others depend on co-operatives and private institutions. Almost every milk producers are concerned about vaccination and majority of them have vaccinated their milch animals to protect them from various diseases. There are many problems facing by the milk producers such as inadequate feed and fodder, low productivity of the cross breed animals, limited availability of health services and poor dairy management practices. Among these low productivity is a serious problem.

## CONCLUSION

Dairying is an important activity that contributes employment and milk. It is a lucrative and very important industry which has a plenty of capability and scope for future growth as an industry. It was proposed in 2007-08 by National Dairy Development Board (NDDB) to increase the country's milk production to meet the projected demand of 180 million tonnes by 2021-22. The principal insistence is given to boost the productivity of milch animals and rise in milk production to satisfy the increasing demand for milk and to help rural milk producer with better approach to arrange milk processing sector. The dairy farming in Kerala is affecting by serious problems such as productivity of dairy animals, lack of scientific livestock feeding practices, inadequacy and unavailability of livestock health care, improper milk marketing facilities and uncertain price of milk for producers. At the same time dairy industry is emerging as one of the important industries in India because of very high demand for milk and its product. Large share of milk (70–85%) of marketable surplus goes through informal channel where quality is a big concern. There is lack of policy focus on strengthening indigenous breeds in rural areas in India. Farmers prices are not based on fat measurement, which affects the profitability of farmers. Small and marginal farmers cannot increase their herd size because of low access to credit and risk-taking ability. Low productivity of milch animals is a serious constraint to dairy development.

There are many potentialities for the development of dairy industry. The government should create policies and activities to enhance dairy farming activity by increasing production and productivity and ensuring fair farmer price for milk. Mergers and acquisitions need to be given importance in dairy industry, primarily to obtain economies of scale. Innovation in dairy sector is also very important which requires huge investment. Government should take necessary steps to encourage private sector to increase investment in dairy industry. One of the major problems in milk marketing is the involvement of the unorganized sector. Intervention of the government by changing the laws and regulation would reduce the

role of unorganized sector in milk marketing. The government should take adequate measures to improve the problem of Scarcity of fodder resources. The government should be concern in the manufacturing and production of vaccines and undertake a regulatory role to ensure quality and availability at a reasonable price to the farmers. Upgraded export potential for traditional types along with western types of milk product, entrenched and develop market for traditional dairy products, rising demand for fluid milk along with value added production, outgrowth exercise for import substitution, employment generation, liberalized policies in dairy sector, opportunity of enormous resources of unconventional feeds and folders etc. are some of the areas to be concentrated.

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