DAIRY FARMING PRACTICES MIDST URBAN AREA OF MYSORE, KARNATAKA, INDIA

Prajwal, G[1] and S. Basavarajappa[2]

M.Sc. student, DOS in Zoology, University of Mysore, Manasagangotri, Mysore-570 006, India[1]

Research guide, DOS in Zoology, University of Mysore, Manasagangotri, Mysore-570 006, India[2]

Abstract: Systematic investigations were conducted to record the dairy farming activities midst urban area of Mysore during May, 2023 to August, 2023. Total 60 dairy farmers from 27 areas were randomly selected using pre-tested questionnaire. Altogether, 60 parameters which covers socio-economic conditions of dairy farmers, cow breeds, feeding, hygienic conditions, disease management, manure used and milk marketing etc, were considered. Scientific data was compiled and systematically analyzed using standard methods. Data indicated quite interesting results. Majority (61.7%) of dairy farmers belong to the middle age group (35-55 years), and it was followed by 23.3, 13.3 and 1.7% dairy farmers respectively young (24-34 years), old age (56-70 years) and 70 years age group. Among the different age groups, only 53.3% dairy farmers had high school education and it was followed by below high school and pre-university level education respectively 16.7 and 11.7%. Only 10% dairy farmers had graduation and 8.3% were illiterates. Interestingly, 95% dairy farmers were male and only 5% female folk were involved with dairy farming.

Moreover, 53.3% dairy farmers had more experience (20-40 years) in this activity and 6.7% are doing this activity since 40 years and considered it as legacy and as self-employment. Surprisingly, most of the dairy farmers (98.3%) didn't have any training on dairy farming and 1.7% dairy farmers have attended the training on modern dairy farming activities. In Mysore, pure breeds both exotic and indigenous origin along with cross breeds was used in dairy farming. Holstien-Friesian and Jersey cattle breeds semen was artificially inseminated with indigenous cattle breeds to produce crossbreed cows. Cross breeds were used more (75%) than local breeds or pure breeds (13.3%). The cow breeds namely Holstein-Friesian, Bargur, Hullikar, Alambadi and Amritmahal were respectively used 4.7, 1.7, 1.4, 1.2 and 1%.

In Mysore, milking from the cattle is being done majorly (93.3%) by males and many families hire milkmen to collect milk from the cows on daily wage basis. However, only 6.7% female folk are involved in milking activity. Majority (73.3%) of the dairy farmers keep only cows and around 26.7% dairy farmers keep cows along with hen, goat and sheep. Further, dairy farmers having small to medium and large cow herd size with minimum 2 to 5, 6 to 10, 11 to 21 respectively by 35, 26.7, 36.6% dairy farmers. Surprisingly, dairy farmers are practicing dairy farming on their own without hiring a labour to maintain the cows. Total 61.7% dairy farmers were practicing zero grazing, where cows are not allowed to graze openly. Only 25% dairy farmers were practicing semi-intensive grazing and 13.3% dairy farmers were practicing extensive grazing. Cows were fed with different quantity of feed that was depended on age and milking status. Further, hygienic practices followed during milking, equipments used for milking, storage and transportation and disease management practices followed were as per the standard norms followed by the dairy farmers. Overall, most of the dairy farmers are happy with their profession and earning good returns despite fulfilling the household requirement in Mysore city.

Key words: Socio-economic conditions, cow breeds, rearing status, Mysore.

I. INTRODUCTION

Dairy farming is one of the important sub-sectors of agriculture, includes breeding, raising and utilization of cattle primarily cows for the production of milk and other by products (Webb, 2021). In India, dairy farming is an age old practice in rural areas and certain urban centres as well (Akhila and Senthilvel, 2012). It is known as the 'Oyster' of the dairy industry with opportunities galore for the entrepreneurs globally (Revanasiddappa et al., 2021). Several cow species are reared for various farm operations such as ploughing, carting, tilling, sowing, weeding, water lifting, threshing, oil extraction, sugarcane crushing, transport etc (Zhou et al., 2018) since prehistoric times. Thus, it play a pivotal role in the rural, semi-urban and urban economy by providing gainful employment opportunities to various group of people in the society along with the production of milk as main product and meat, skin, dung, bones, manure as by products of dairy

(Yuvaraja *et al.,* 2019). Current years, dairy farming is considered as a remunerative activity, as it contributes good returns and helps develop socio-economic conditions (Birthal and Negi, 2012) among the rural poor and at many urban centres also. Besides, people can get regular income, employment opportunity, milk, milk by products and earns foreign exchange considerably (Bereda *et al.,* 2014). Interestingly, India is blessed with largest livestock population with 535.78 million with an increase of 4.6% in recent years. Of the total livestock population, cattle and buffaloes accounts for 35.94 and 20.25% respectively. Among different states in India, Uttar Pradesh stand first with 67.8 million livestock, whereas Karnataka ranks 9th and has 29.0 million livestock populations with an increase of 4.7% when compared to previous census held in 2012. In Karnataka, Belgaum ranks first followed by Tumkur, Bellary, Chitradurga and Bagalkote districts. Milk is the major by product of dairy, most perishable commodity (Gashaw and Gebrehiwot, 2018) and used as the best source of nutrition by all age groups in rural, semi-urban and urban areas (Drewnowski, 2011; Shukla and Upadhyay, 2017). According to Food and Agricultural Organisation Corporate Statistical Database (FAOSTAT), India is the highest milk producer, rank first position in the world contributing 24% of the global milk production in 2021-22.

The per capita availability of milk is 444 grams per day/person in India. The largest producer of milk in India is Rajasthan with 15.1% of the total milk production in the country. Karnataka state ranks 9th among the top milk producing states and accounting 5.4% of the country's total milk production with a per capita availability is 483 grams per day. The dairy industry boosts family nutrition standards (Kubicova *et al*., 2019) provide continuous income along with partial or full time employment to various classes of people in the society. Hence, dairy farming is currently a significant source of livelihood in rural and urban areas. Farmers are regularly and consistently getting good income and eventually that could help improve the socio-economic conditions (Birthal and Negi, 2012). Mysore is one of the fast developing cities in Karnataka, which have attained most of its growth to date at different directions. Current year's, growth of population in Mysore warrants an increased production of high quality protein rich food (Drewnowski, 2011) along with milk. Surprisingly, many people are practicing dairy farming at small to medium levels. Dairy farming is considered as one of the occupations by various people to satisfy the need to meet the growing demand of milk in Mysore.

However, published reports are sparse about dairy farming. Table 1 show the research work carried out at different parts of the world including India and in few parts of Karnataka State. Hence, published reports on dairy farming in Mysore are poor rather sparse. Mysore has favourable climate and one of the best tourist places in south India, attract more tourists from different parts of the world and people from different parts of India are planning to settle down midst every nook and corner of Mysore city. Due to rapidly increasing population and fast growth, there is an increasing demand for milk and its by-products. Therefore, present study was undertaken to record the status of dairy farming activities midst Mysore city. Moreover, the status of dairy farming in and around Mysore has not been studied so far critically. Hence, the present study was necessitated.

II. MATERIALS AND METHODS

Study Area: Mysore is one of the historic cities of south India, most famous tourist place, known for its Palaces, Zoological Gardens, Temples, Heritage Buildings etc (Lokeshwari and Nanjunda, 2012). Mysore city is spread across an area of 128.42 km^{2}at the foot of the Chamundi Hills and lies between 12°13^1 to 12°22^1 north latitudes and 76°33^1 to 76°45^1 east longitude (Saritha, 2019) with an altitude 770 meter above MSL. It is located in the southern plateau of Mysuru District in the southern part of Karnataka State having moderate weather as determined by tropical monsoon that could be the result of the interplay of the two opposing air masses of the north-east and south-west monsoons (Kamath, 2001).

The Mysore records maximum temperature 40°C and the minimum temperature 15°C with a mean temperature 30.2^{o}C. Annually, Mysore receives nearly 800mm rainfall from April to October that determines a favorable climate around the year for livestock farming. Mysore Dairy was started in the year 1965 under the control of the Department of Animal Husbandry and Veterinary Services of Karnataka State and it was transferred to Karnataka Dairy Development Cooperation in the year 1974. Since then, many farmers are practicing small to medium, medium to large scale level dairy farming in Mysore city.

Methodology: Investigation on dairy farming activities adopted by farmers and others in Mysore city was done from May, 2023 to August, 2023 by selecting different areas (Figure 1). Total 60 dairy farmers were randomly selected in and around Mysore. The selected famers were interviewed and data on dairy farming activities were collected with the help of pre-tested questionnaire by following standard methods. More than 40 parameters were considered during the field survey to reveal the socio-economic conditions, cow breeds and their herd size, feeding practices, hygienic milking practices, constraints, manure management, animal health care and milk production and marketing methods adopted by the dairy farmers by following standard methods. Observation was also made during the field visit to record the cleanliness of cow's shed, type of feed and feed storage, type of equipments used to collect milk etc. The collected data was systematically complied, analyzed by following standard methods as per Saha (2009).

III. RESULTS AND DISCUSSION

Socio-economic conditions: Table 2 shows the socio-economic conditions of dairy farmers in Mysore. Majority (61.7%) of dairy farmers belong to the middle age group (31-55 years), and it was followed by 23.3% of dairy farmers who were in the young age group i.e., 24-34 years. However, 13.3% dairy farmers belong to the old age group i.e., 55-70 years and only 1.7% of them were in the age of 70 years (Table 2). In Mysore city, majority of the dairy farmers belonged to middle age group who opined that inability to pursue required education, lack of employment opportunities have dragged their attention towards dairy farming. Most of the dairy farmers are doing dairy farming activity in order to continue the legacy of their fore fathers occupation. Farmers with different age groups are considered dairying as one of the economic activity, earn regular income, family members are involved in this activity at different parts of urban areas of Mysore. Similar type of observations was reported by Paudel (2014), Mahesh *et al*. (2020), Bansod *et al.* (2022) and Saurav *et al.* (2023) and who also reported that majority of the dairy farmers belonged to middle age group playing a major role in income generation in the family. Further, education plays a pivotal role to undertake dairy farming activity on scientific basis with attractive returns. In Mysore, 53.3% dairy farmers had high school level education and it was followed by 16.7% farmers who had below high school level education. Moreover, pre-university level education was obtained by 11.7% dairy farmers, 10% dairy farmers had graduation level education and 8.3% were illiterates (Table 2). Education is considered as one of the important elements, requires every individual life to improve their socio-economic conditions that could help achieve overall growth and development of the family in a society.

Therefore, education is a powerful tool, acts as a driver of socio-economic development and becomes one of the strongest instruments that would help in agriculture and allied animal husbandry practices in general (Yuvaraja *et al.,* 2019) and dairy farming in particular (Sharma, 2016). It is generally believed to have an effect on widening the mental horizon of a person and thereby, prepare or predispose him to adapt new ideas (Saurav *et al.,* 2023), skills with greater enthusiasm. Although, Mysore is one of the educational hubs, quite a good number of educational institutions are functioning to cater the need of all class of local population. Despite, it was observed that there are illiterates who are practicing dairy farming activity. Similar type of situation was reported by Saurav *et al.* (2023) in Northern Bihar, where 20.6% dairy farmers were illiterates and remaining farmers had primary to below graduate level education (Table 2). In Yadgir district of Karnataka, 15% of the dairy farmers were illiterates due to illiteracy of their parents, poor exposure on importance of formal education and low socio-economic status (Chandrashekar *et al.,* 2017; Satish *et al.,* 2018; Mahesh *et al.,* 2020 and Bansod *et al.,* 2022). Furthermore, in Mysore, 95% male folk are involved with dairy and only 5% female folk are partly or fully involved with dairy farming (Table 2). Male folk are ready to do any type of hard work connected to dairy such as caring of milking animals, maintenance, feeding etc, are looked with utmost care during most of the hours in a day compared to women folk. As, women folk has to attend household activities such as cooking, cleaning and other routine activities, perhaps this might have hindered the more involvement with dairy animals rearing compared to men folk (Shinde, 2011). Similarly type of observations was reported by Arun (2013), Fathima (2014) and Saurav *et al.* (2023). Around 53.3% dairy farmers had more experience (20-40 years) in dairy farming activity and it was followed by 11-20, 2-10 years and 40 years of experience respectively by 23.3, 16.7 and 6.7% dairy farmers (Table 2). Dairy farming is an age old practise carried out by the farmers that was inherited by their grand fathers. In old Mysore area, many people are not well educated and partly or fully depended on dairy farming as their livelihood practice. In few families, present day younger generation considered dairy farming as legacy learnt from their fathers and grand fathers, continuing with utmost care in certain areas of Mysore city.

Similar type of observations was reported by Saurav *et al.* (2023) in northern Bihar. Unfortunately, most of the dairy farmers (98.3%) didn't had any training on dairy farming (Table 2) and not following modern methods of dairy farming activity. However, only 1.7% dairy farmers have attended the training on modern dairy farming activities (Table 2). Interestingly, majority of the dairy farmers opined that dairy farming activity is learnt through their parents and grandparents as one of the conventional occupation. Therefore, training is very essential to update the knowledge on modern dairy farming (Raina *et al*., 2017). In Mysore, milking from the cows is being done majorly (93.3%) by males and only 6.7% female folk is involved in it (Table 2). However, few families hire milkmen to collect milk from the cows on daily wages. The herd size of cows in a dairy is not big. Around 21 cows were reared by 1.7% of the dairy farmers and it was followed by 11 to 20, 6 to 10 and 2 to 5 cows respectively by 26.7, 36.6 and 35% dairy farmers (Table 2). Hence, cow herd size varied considerably and the dairy farming is practiced on small to medium and large scale levels in Mysore.

Further, the major reasons for having small herd size of cows are due to lack of space. Majority of the farmers sell their cow after the lactation period is over. Similar type of observations was reported by Bansod *et al.* (2022), Mahesh *et al* (2020). Further, majority (73.3%) of dairy farmers didn't keep other livestock in their farm except cows, whereas 26.7% dairy farmers rear cows along with other livestock such as hen, goat and sheep (Table 2). The reason beyond the rearing of hen, goat and sheep along with cows rearing is due to less financial investment, easy management and better earning.

Hence, few farmers are practicing cows rearing along with other livestock to earn more income around the year. In Mysore, most (100%) of the dairy farmers are practising dairy farming on their own without involving any hired labourers (Table 2). So, dairy farming is considered as a self-employment to most of the dairy farmers.

Cow breeds rearing status: Tables 3 and 4 shows the cow breeds used in dairy farming by farmers in Mysore. Lactating cow, heifers, calves and pregnant cows belong to different breeds are used commonly in Mysore. Few dairy farmers use pure breeds both exotic, indigenous and cross breeds in dairy farming. Per cent occurrence of different breeds including cross breeds used in dairy farming in Mysore is depicted in Figure 2. Further, analysis of variance of cow breeds reared with lactating, non-lactating (Heifers and calves) and pregnant cows status during dairy farming revealed no significant difference (F=0.204; df = 23) existed between the breeds in Mysore. This indicated that during dairy farming all the different staged (milking and pregnant staged) cows are found along with heifers and calves (Tables 3 and 4). Moreover, crossbred cows provide more milk compared to local breeds and hence, many farmers are depended on cross breeds. However, few farmers exclusively depend on exotic breeds and local indigenous breeds to maintain the breed and to get the milk for household purpose.

Cattle breeding: Table 5 shows the cows breeding followed by dairy farmers in Mysore. Majorly (80%), heating cow are fertilized by artificial insemination (AI) and only 8.3% heating cows were fertilized by natural means by allowing bull to inseminate the cow. However, 11.7% dairy farmers follow both (Table 5). Usually, artificial insemination is done free of cost by the Veterinary doctors (92.7%) at hospital (36.4%), home (43.6%). Further, to conceive a cow, normally 1 to 2 times artificially inseminated (83.6%) and certain cases, it was more than two times. Further, majority (94.6%) of the farmers revealed their satisfaction about the artificial insemination method (Table 5).

Feeding management practices: The feeding practises followed by dairy farmers are depicted in Table 6. Majority (61.7%) of dairy farmers are practicing zero grazing, where cows are not allowed to graze openly. Instead, cows were confined to a shed, where feed and water are provided to caged cows with inadequate grazing infrastructure. However, only 25% dairy farmers practicing semi-intensive grazing, in which the cows were housed within a shed and allowed them to graze freely at the vicinity of their shed. Semi-intensive farming is not a regular practice, whenever the feed cost is hiked or during non-availability of grass and other forage under such circumstances, semi-intensive grazing is followed. Moreover, 13.3% dairy farmers were practicing extensive grazing; where cows were allowed outdoors to roam around different areas to consume wild vegetation due to good grazing infrastructure available nearby their cattle shed (Table 6). This method would help them to save the feed costs some extent. Accordingly, cows feeding are not evenly practiced among the dairy farmers. Majority (50%) of the dairy farmers provide 11 to 25 kg of food per cow per day and it was followed by 26 to 40, 4 to 10 and more than 40 kg feed per cow per day respectively by 25, 20 and 5% dairy farmers who are practicing zero grazing and the quantity of ration fed to cow per day was comparatively less to cows which are reared under extensive and semi-intensive grazing practices. Further, the type of feed and quantity of feed provided to cows was exclusively depended on the age and milking status of a cow. Majority (86.7%) of the dairy farmers provide grass and concentrates to cows of all age groups. Remaining 13.3% of dairy farmers provide concentrates only (Table 6). Hence, type of feed given to cows varied considerably among the dairy farmers. Availability of grass or hay and cost of the feed preferably the concentrated feed are not easily affordable to dairy farmers who are practicing cows rearing on small scale levels. Further, many dairy farmers are unaware about improved feeding methods that includes the specific feeding of quality food to milking cows, pregnant cows, heifers and calves. They follow conventional feeding practices that may or mayn't include concentrate feed and quality green grass. Further, 35% of the dairy farmers had experienced shortage of feed due to lack of non-availability of green grass or hay and also at higher prices of fodder (Table 6). Sometimes, farmers provide only concentrates and allow cows for extensive grazing. Thus, feeding is uneven and it is not depended on age and milking status of cow.

Marketing of milk: Dairy farmers sell the milk using various platforms such as to local market (33.3%), government milk dairy (13.3%), private milk dairy (35%) and local milkmen (6.7%) (Table 7). The milk price varied considerably and it was started from Rs. 28/ litre to up to Rs.70/- and it was depended on the centres at which the milk was sold (Table 7). Few dairy farmers who are keeping pure cow breeds are selling the milk at higher price i.e., Rs.70 per litre (Table 7). Interestingly, 6.7% dairy farmers market the milk to local milkmen who is a milk vendor; sell milk at the rate of Rs. 32 to 40/- (Table 7). The transport facility is good, majority of the dairy farmers (68.6%) use motorcycle and bicycle (2.9%) only. Remaining dairy farmers are not using any vehicle to transport the milk to nearby dairy centres (Table 7). Similar type of observations were made by Geetha and Lavanya (2013), Popker and Guntur (2014), Kumawat and Singh (2016), Sunil *et al*. (2016) and Swamy *et al*. (2021).

Hygienic practices: Table 8 shows the hygienic practices followed during milking by dairy farmers. About 53.3% milkmaids (milkers) wash udder before and after milking, whereas 46.7% milkmaids cleans before milking only. Cows are usually milked twice a day after hand cleaning and udder wash avoid microbial contamination if any. Since udder

have direct contact with the ground, urine, dung and feed refusals while resting (Gashaw and Gabrehiwot, 2018), it is necessary to clean udder before milking. Further, 76.7% milkmaids use silver vessel to store the milk and it was followed by 11.7, 8.3 and 3.3% milkmaids used respectively steel, aluminium and plastic utensils during milking (Table 8). Plastic containers use is negligible (3.3%); it is a potential source for the contamination of milk by bacteria, because it allows the multiplication of bacteria on milk contact surface during the interval between milking. Metal containers such as aluminium and stainless-steel cans are recommended under the code of hygienic practices (Gashaw and Gabrehiwot, 2018). Thus, equipments used for milking, storage and transportation also determine the quality of milk and milk products (Gashaw and Gabrehiwot, 2018).

Cow health maintenance by dairy farmers: Table 9 shows the cow health maintenance adopted by dairy farmers in Mysore city. Majority (96.7%) of the dairy farmers vaccinate their cows regularly. Amongst them, 93.3% dairy farmers vaccinate for foot and mouth diseases and 85% dairy farmers vaccinate for lumpy skin disease. Moreover, most of the dairy farmers provide deworming tablets to their cows. Interestingly, only 48.3% dairy farmers were happy and have satisfaction about the veterinary services rendered by the government veterinary hospitals (Table 9). However, 51.7% dairy farmers showed dissatisfaction about the veterinary services due to disease incidence (18.3%), death of cow due to diseases (36.7%) (Table 9). Similar type of observations was reported by Akhila and Senthilvel (2011).

Manure Management: Table 10 shows the management of manure by dairy farmers at Mysore city. Only 8.3% dairy farmers use cow dung to make manure for their domestic use. Among them, 80% dairy farmers used manure for crop fields and 20% dairy farmers used cow dung as fuel. However, 91.7% dairy farmers are not using cow dung manure for domestic purpose; instead they (33.3% dairy farmers) sell cow dung manure to earn money respectively Rs. 1,500 to 10,000/-, Rs. 10000/- and Rs. 20/- to 800/- by 50, 35 and 15% dairy farmers annually (Table 10). Thus, besides milk production, many dairy farmers are getting attractive returns annually by selling cow dung manure in Mysore city.

Constraints: Table 11 shows the commonly occurring constraints faced by dairy farmers at Mysore city. Total 13 different types of constraints were recorded during the present investigation. Of all, nine constraints were commonly found among majority of the dairy farmers. The major constraint recorded among the dairy farmers was the high cost of feed (33.5%), it was followed by low market price of milk (23.1%), lack of space to rear cows (15.6%), high cost of medicines (12.7%), commonly occurring animal diseases (5.8%), non availability of financial assistance to purchase new cows (3.5%), lack of fodder or roughage (3.4%), low quality fodder (1.2%) and low milk yield (1.2%) (Table 11). Constraint refers to the problems which are faced by dairy farmers while conducting the farming activity. It could also refer to the difficulty to operate and manage cows during dairying. Constraints could be physical or policies which may hinder the effective and efficient management of a dairy and livestock activities (Bansod *et al.* 2022). Similar type of observations was made by Akhila and Senthilvel (2011), Patil *et al.* (2009) and Harish et *al.* (2019) among the dairy farmers respectively in Karur District of Tamil Nadu and in Nagpur district of Maharashtra State. Thus, our observations are on par with the observations of Ghosh and Maharjan (2001), Malik *et al.* (2005), Patil *et al.* (2009), Akhila and Senthilvel (2011), Birthal and Negi (2012), Nargunde (2013), Khan and Parashari (2014), Singh (2015), Chandrasekar *et al.* (2017), Girish *et al.* (2020) and Bonsod *et al.* (2022).

IV. SUMMARY AND CONCLUSION

Total 61.7% dairy farmers belong to the middle age group (35-55 years) and only 1.7% of them were in the age of 70 years. 53.3% dairy farmers had high school level education and 8.3% were illiterates. 95% dairy farmers are male and 53.3% had more experience (20-40 years) in dairy farming activity. Around 6.7% dairy farmers are practicing dairy farming since 40 years. 98.3% didn't have any training on dairy farming. Milking from the cattle was being done majorly (93.3%) by males and few dairy farmers hired milkmen on daily wages. Maximum 21 cows were reared by 1.7% of the dairy farmers. The herd size was 11 to 20, 6 to 10 and 2 to 5 cows respectively by 26.7, 36.6 and 35% dairy farmers. Total 26.7% dairy farmers rear cows with other livestock such as hen, goat and sheep. Around 75% of the dairy farmers used cross breed cows and 13.3% farmers use pure breed cows. Commonly used breeds were Holstein-Friesian, Jersey, Punganur, Garuda Bargur, Hullikar, Alambadi and Amritmahal among them Holstien-Friesian and Jersey cattle breeds semen was artificially inseminated with indigenous cow breeds to produce crossbreed cows. Further, 61.7% dairy farmers were practicing zero grazing and it was followed by 25% semi-intensive grazing and 13.3% extensive grazing practices. The feeding practices, hygienic maintenance during rearing and milking was good.

Overall, dairy farming activity was conducted on scientific methods efficiently by the farmers except few constraints in urban centre of Mysore. Dairy farming is considered as remunerative activity by different people and earning regular income to meet household expenses and to improve socio-economic conditions midst urban centres. Thus, dairy farming provides good employment opportunities to men and women folk even at urban centres.

It should be supported by providing required necessary facilities to people who are involved in dairy thereby it could help elevate the socio-economic conditions of the people and improve the nutritional diet.

V. RECOMMENDATIONS

Dairy farmers are facing few constraints which require suitable solutions.

- Dairy farmers who are practicing cows rearing on small scale should be given financial assistance for cow shed construction.
- Every dairy farmer should be given training on modern dairy techniques compulsorily.
- Periodic health checks up, vaccination and deworming should be made to all the cows so as to maintain good health among the herd.
- Government should take measures to establish market to sell quality forage i.e., green fodder.
- Government should enhance the milk price time to time due to escalating prices of forage and other requirements.
- Further in depth many more investigations are required on different aspects of dairy farming to formulate the methods to overcome the constraints faced by the dairy farmers.

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Table 1. Published reports on dairy farming activities in India and other parts of the world

Sl. No.	Researched on	Place	Author & Year
1.	Impact of dairy cooperative on rural income generation using small dairy farms.	Bangladesh	Ghosh and Maharajan (2001)
2.	Status of existing dairy farming practices	Uttar Pradesh, India	Malik *et al* (2005)
3.	Constraints faced by the dairy farmers and animal management practices	Nagpur District, India	Patil *et al* (2009)
4.	Status of dairy farming	Karur District, Tamil Nadu	Akhila and Senthilvel (2012)
5.	Demand for animal products, significant opportunities for enhancing agricultural growth and reducing rural poverty through the livestock route.	-	Birthal and Negi (2012)
6.	Economic analysis of dairy farming	Vellalore, Coimbatore District	Geetha and Lavanya (2013)
7.	Role of the dairy industry in rural development and income for small seasonal farmers and occasional labor.	-	Nargunde (2013)
8.	Milk Cost, Return and Profitability in Dairy Farming	Southern Romania	Popesou (2014)
9.	Women Dairy Farmer and the economic condition of the women after practicing dairy farming	Madurai District, Tamil Nadu	Fathima (2014)
10.	Socio-economic conditions of dairy farmers	Lamahi Chilling Centre, Dang District, India	Paudel (2014)
11.	Socio-economic status of the milk producers of primary milk society	-	Popker and Guntur (2014)
12.	Economic impact of integrated dairy development project on rural households	Meghalaya, India	Singh (2015)
13.	Effect of age and educational level of dairy farmers on knowledge and adoption of dairy farming practices	Kapurthala District, Punjab, India	Sharma (2016)
14.	Economics of milk production	Mandya District, Karnataka, India	Sunil *et al.* (2016)
15.	The training needs of dairy farmers	Jammu and Kashmir state	Raina *et al.* (2017)
16.	Relationship between socio-economic and psychological factors of dairy farmers	Bengaluru rural district, Karnataka, India	Chandrashekar *et al.* (2017)
17.	Milk hygiene, quality control in the market chain in Jimma.	Jimma, Ethiopia	Gashaw and Gebrehiwot (2018)
18.	Adoption of good farming practices among commercial dairy farmers	Karnataka, India	Sathisha *et al.* (2018)
19.	Dairy production constraints	Kolar and Chikkaballapur Districts, Karnataka, India	Harisha *et al.* (2019)
20.	Comparative economics of rural and urban dairy farming	Kalburgi District, Karnataka, India	Patil *et al.* (2019)
21.	Economic analysis of the dairy farming	Kakkinje Grama Panchayath, India	Yuvaraja *et al.* (2019)
22.	Assessment of livelihood security of farmers practicing sericulture based dairy farming	Karnataka, India	Girish *et al.* (2020)
23.	Socio-economic profile of dairy farmers	Yadgir District, Kalyana Karnataka, India	Mahesh *et al.* (2020)
24.	Socio-economic profile and constraints faced by dairy farmers	Udham Singh Nagar District, Uttarakhand, India	Bansod *et al* (2022)
25.	Socio-economic profile of dairy farmers	Northern Bihar, India	Saurav *et al* (2023)

Table 2. Socio-economic conditions of dairy farmers

Sl. No.	Parameters		% Occurrence	Total
1.	Age of the dairy farmers (in years)	Young (24-34)	23.3	100.0
		Middle (31-55)	61.7	
		Old (55-70)	13.3	
		Above 70	1.7	
2.	Educational qualification	Illiterate	8.3	100.0
		Below High School level (1-7)	16.7	
		High School level (8-10)	53.3	
		PUC	11.7	
		Graduate and above	10.0	
3.	Gender	Male	95.0	100.0
		Female	5.0	
4.	Experience (in years)	2-10	16.7	100.0
		11-20	23.3	
		20-40	53.3	
		Above 40	6.7	
5.	Training if any	Yes	98.3	100.0
		No	1.7	
6.	Gender involved in milking	Male	93.3	100.0
		Female	6.7	
7.	Herd size (No. of cows/family)	Small (2-5)	35.0	100.0
		Medium (6-10)	36.6	
		Large (11-20)	26.7	
		21 and above	1.7	
8.	Cows rearing with other livestock	Yes	26.7	100.0
		No	73.3	
9.	Labour used	Self-employment	100	100.0
		Paid workers	-	

Table 3. Cow breeds used by dairy farmers

Sl. No.	Type of breed	% Use
1.	Local pure breeds only	3.3
2.	Exotic pure breeds only	1.7
3.	Cross breeds only	75.0
4.	Both local pure breeds and cross breeds	13.3
5.	Both exotic breeds and cross breeds	6.7
	Total	100.0

Table 4. Analysis of variance of cow breeds and their rearing status

Sl. No.	Breed Name	Lactating cow	Heifers	Calves	Pregnant cow	Total
1.	Amritmahal	01	02	02	-	05
2.	Alambadi	03	01	-	02	06
3.	Bargur	03	-	04	01	08
4.	Garuda	01	-	-	01	02
5.	Hullikar	-	01	05	01	07
6.	Punganur	01	01	01	-	03
7.	Holstein-Friesian	15	02	03	04	24
8.	Jersey	01	-	03	-	04
9.	Crossbreeds	208	52	112	79	450
	Total	233	59	130	88	510
	'F' value	0.204				-

Table 5. Cow breeding followed by dairy farmers

Sl. No.	Parameters		% Occurrence	Total
1.	Type of fertilization	Natural	8.3	100.0
		Artificial insemination (AI)	80.0	
		Both	11.7	
2.	Payment	Yes	100	100.0
		No	-	
3.	Location	Hospital	36.4	100.0
		Home	43.6	
		Both	20	
4.	Insemination performed by	Government inseminator	7.3	100.0
		Private inseminator	-	
		Farmer AI technician	-	
		Veterinarian	92.7	
5.	No. of artificial insemination services per conception	1-2 times	83.6	100.0
		3-4 times	12.8	
		5-8 times	3.6	
6.	Satisfied by artificial insemination service	Yes	94.6	100.0
		No	5.4	

Table 6. Feeding practices followed by dairy farmers

Sl. No.	Feeding practices		% Occurrence	Total
1.	Type of grazing	Zero grazing	61.7	100.0
		Extensive grazing	13.3	
		Semi intensive grazing	25.0	
2.	Feed per cow (in Kg)	4-10	20.0	100.0
		11-25	50.0	
		26-40	25.0	
		Above 40	5.0	
3.	Type of feed	Concentrates only	13.3	100.0
		Grass and other forage	-	
		Free range	-	
		Mixture of concentrates and grass	86.7	
4.	Shortage of feed if any	Yes	35.0	100.0
		No	65.0	
5.	Feeding of water per cow (in Litre)	10-20	18.3	100.0
		20-40	66.7	
		40-60	6.7	
		Above 60	8.3	
6.	Source of water	On farm well	-	100.0
		Piped public water supply	100	
		River/Stream/Pond	-	
		Others	-	
7.	Shortage of water if any	Yes	-	100.0
		No	100	

Table 7. Milk production and marketing by dairy farmers

Sl. No	Parameters		% Occurrence	Total
1.	Milk production per day (in Litres)	3-10	6.8	100.0
		11-20	10.0	
		21-30	23.3	
		31-40	23.3	
		41-50	13.3	
		51-60	10.0	
		Above 60	13.3	
2.	Milk sale locally per day (in Litres)	5-10	10.7	100.0
		11-20	17.9	
		21-30	28.6	
		31-40	25.0	
		Above 40	17.8	
3.	For household consumption per day (in Litres)	0.5 - 2	75.0	100.0
		3-4	25.0	
4.	Milk wastage	Yes	10.0	100.0
		No	90.0	
5.	Marketing of milk	Local market only	33.3	100.0
		Government milk dairy only	13.3	
		Private milk dairy only	35.0	
		Government milk dairy and local market	3.3	
		Private milk dairy and local market	5.0	
		Both government and private milk dairies and local market	1.7	
		Milkman	6.7	
		Do not sell milk	1.7	
6.	Milk price locally per Litre	Rs.38-40/-	84.6	100.0
		Rs.42/-	11.6	
		Rs.70/-	3.8	
7.	Milk price in Government Milk Dairy per Litre	Rs.28-30/-	27.3	100.0
		Rs.31-33/-	72.7	
8.	Milk price in Private Milk Dairy per litre	Rs.30-33/-	60.0	100.0
		Rs.33.5-35/-	40.0	
9.	Selling price per litre from milkman	Rs.32	50.0	100.0
		Rs.40	50.0	
10.	Modes of transport used to reach milk dairy	By walking	11.4	100.0
		Bicycle	2.9	
		Motorcycle	68.6	
		Milk is collected at home	17.1	

Table 8. Hygienic practices followed during milking by dairy farmers

Sl. No.	Hygienic practices		% Occurrence
1.	Frequency of milking per day	Once	-
		Twice	100
		Thrice	-
2.	Clean hands before milking	Yes	100
		No	-
3.	Clean utensils before milking	Yes	100
		No	-
4.	Washes udder before milking	Yes	100
		No	-
5.	When is udder washed	Before milking only	46.7
		After milking only	-
		Before and after milking	53.3
6.	Type of milk container	Plastic	3.3
		Aluminium	8.3
		Silver	76.7
		Steel	11.7
7.	Source of water for cleaning	Piped/tap	100
		River/stream/pond	-
		Private ground pump	-
		Community ground pump	-

Table 9. Cow health maintenance by dairy farmers

Sl. No.	Parameters		% Occurrence	Total
1.	Vaccination to cows	Yes	96.7	100.0
		No	3.3	
2.	Vaccination against specific diseases	Foot and Mouth Disease (FMD)	93.3	100.0
		No vaccination for FMD	6.7	
		Lumpy Skin Disease (LSD)	85.0	100.0
		No vaccination to LSD	15.0	
3.	Vaccination done by payment	Yes	17.2	100.0
		No	82.8	
4.	Disease incidence to cow	Yes	18.3	100.0
		No	81.7	
5.	Death of cow due to disease since 12 months	Yes	36.7	100.0
		No	63.3	
6.	Satisfied with Veterinary services	Yes	48.3	100.0
		No	51.7	
7.	Deworming of cows	Yes	100	100.0
		No	-	

Table 10. Cow dung manure management by dairy farmers

Sl. No.	Parameters		% Occurrence	Total
1.	Cow dung manure use	Yes	8.3	100.0
		No	91.7	
2.	Cow dung manure used for	Crop field	80.0	100.0
		Fuel	20.0	
		Biogas	-	
		Others	-	
3.	Selling cow dung manure	Yes	33.3	100.0
		No	66.7	
4.	Earned money by selling manure	Rs. 20 to 800/-	15.0	100.0
		Rs. 1,500-10,000/-	50.0	
		Above Rs. 10,000/-	35.0	

Table 11. Commonly occurring constraints faced by dairy farmers in Mysore

Sl. No.	Constraints	% Occurrence
1.	Non-availability of fodder or roughages during time of need	3.4
2.	Availability of low quality fodder	1.2
3.	High cost of feed	33.5
4.	Lack of credit to buy new cows	3.5
5.	Lack of farm labourers	-
6.	Low milk yield	1.2
7.	Low market price of milk	23.1
8.	Low quality of milk	-
9.	Infertility	-
10.	Animal disease	5.8
11.	Good quality of semen and genetics	-
12.	Lack of space	15.6
13.	High cost of medicines	12.7
	Total	100.0

Figure 1. Map Showing the study area in Mysore City

Figure 2. Cow breeds used in Mysore