Managemental practices followed by the dairy farmers in Tamil Nadu state

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Abstract
The study was conducted in 23 districts of Tamil Nadu state to find out the general management practices followed by dairy farmers on feeding, breeding, health care, production performance of the dairy animals, and also the constraints involved in dairy farming. The majority of the farmers had a medium herd size of 5–8 animals with cross-bred Jersey cattle as the choice of dairy animal. The average daily milk yield of crossbred HF, cross-bred Jersey, and the non-descript cow was 11.83, 8.57, and 5.2 liters per day respectively. The average sale price of milk per liter was Rs. 3.18, and it ranged from Rs. 2.2 to 50 depending upon the availability of marketing demand. The majority of dairy farmers (64%) fed green fodder 15-20 kg/day/animal and the remaining farmers fed 20-30 kg per day per cattle. The majority of respondents (41.33%) fed 2.5-3.5 kg of concentrate feed per day followed by 33.33% of farmers fed 1-2 kg of concentrate feed per day. The majority of the respondents (above 90%) were aware and regularly following of vaccination and deworming practices. All of the farmers following the artificial insemination method to breed animals. The low cost for milk sale price, low milk yield, and high occurrence of reproductive disorders were the major constraints faced by the dairy farmers. The present study will help the policy developers to propose any modifications or improvements needed for the dairy farming production system in Tamil Nadu for the dairy farming community’s betterment.

Keywords: dairy farmer, managemental practices, feeding, breeding, herd size, milk production

Introduction
Tamil Nadu, the Southernmost State of India, is one of India’s most agriculture progressive States (ANS, 2020). Agriculture continues to be the backbone of this State economy. The Animal Husbandry sector is emerging as an important sector leveraging the rural economy of Tamil Nadu. A majority of Tamil Nadu farmers including the small, marginal farmers and landless laborers depend on animal husbandry for their livelihood (Karthikeyan et al. 2018) [3]. Further, livestock rearing provides supplementary employment as well as a sustainable source of income. Besides, this livestock sector provides a continuous flow of essential livestock products like milk, meat, eggs, draught power, wool, hides, and manure (ANS, 2020). As per the 20th Census, the total livestock population increased to 244.51 lakhs showing a growth of 7.6%. The contribution of the livestock sector to the Gross State Value Added (GSVA) is 5.29% and that to the Agriculture and allied activities is 42.05% (ANS, 2020). The estimated milk production, during the 2005-06 year was 54.74 lakh Metric Tonnes (LMT) in Tamil Nadu and milk production increased to 83.62 LMT during 2018-19. The per capita availability of milk per day increased from 231 gm to 268 gm during 2005-06 to 2017-18 (ANS, 2020). To assess the feeding, breeding, disease control, milk production performance, and other managemental practices followed by Tamil Nadu farmers and also major constraint involved in the dairy farming in Tamil Nadu, this study has been undertaken in 23 districts of Tamil Nadu.

Materials and Methods
For this study, the dairy farmers from 23 districts of Tamil Nadu such as Ariyalur, Chennai, Coimbatore, Cuddalore, Dharmapuri, Dindigul, Erode, Kallakurichi, Krishnagiri, Nagapattinam, Namakkal, Perambalur, Pudukkottai, Salem, Sivagangai, Thanjavur, Thirupathur, Thirupur, Thiruvallur, Thiruvannamalai, Trichy, Vellore and Villupuram were
randomly selected. The selection of farmers based on the criteria that the selected farmers should have the milch animal either a cow or a buffalo in lactating condition. Thus, a total of 75 respondents were randomly selected from 23 districts of Tamil Nadu for this study. The data were collected by personal interview method using a pre-tested interview schedule with the respondents in November 2020. The data pertaining to general management practices on feeding, breeding, and health care management of dairy animals were collected. Similarly, data related with breeds of dairy animals hold by farmers, per day milk production and sale price of milk also collected. Further, the constraints involved in dairy farming and type of breeding methods followed by the dairy farmers were also collected. The collected data were analyzed using appropriate statistical procedures and presented.

Results and Discussion
Herd size and milk production performances
The majority of the respondents were medium size (48%) followed by small size herd size (28%) and large size herd (0.24%). The range of herd size is from 2 to 37 number and the mean value of herd size was 7.12 (Table 1). The medium herd size had by farmers is indicative of the fact that dairy farming is an important component of households’ income-generating activities (Karthikeyan et al. 2018) [9]. Our results were similar to the results of Senthilkumar et al. (2005) [6] and contradicting the results of Ramkumar et al. (2001) [8], Tamizhkumar and Rao, (2012) [11] and Rajadurai et al. (2020) who found that dairy farmers had a small herd size of cattle. The majority of respondents had crossbred Jersey cattle (85.33%) as the choice of breed followed by Holstein-Friesian crossbred cattle (44%) as the second-choice breed for milk production because of the less occurrence of reproductive disorders, better withstanding of heat stress, high fat and SNF and ease of handling the animals (Vijayakumar et al. 2019) [14]. The average daily milk yield of crossbred HF, cross-bred Jersey, and the non-descript cow was 11.83, 8.57, and 5.2 liters per day respectively. The milk production per day of cross-bred Jersey and cross-bred HF were 4-15 liters and 6-20 liters respectively (Table 2). Similar results were also found by Karthikeyan S., et al., 2018 [3]; they reported that the majority of farmers’ total milk production in the household was 5to 22 liters per day. The average sale price of milk per liter was Rs. 31.18 and it ranged from Rs. 22.00 to 50.00 depending upon the availability of marketing demand. Akila and Sakthivel, (2012) [1] reported that the Rs.15/- for cow milk and Rs. 20/- for buffalo milk were sale price. However, compared to the previous study the milk price per liter has been increased substantially.

Feeding management
Feeding management in dairy enterprise plays an important component because its accounts for 75% of production cost. Hence, having current knowledge of feeding management in dairy farming is highly essential. The dairy farmers of Tamil Nadu offered green fodder with varying quantities like 15-20 kg and 20-30 kg per day per adult cattle. Among these two categories, the majority of respondents (64%) offered 15-20 kg green fodder per day. Similarly, 72 % of farmers fed their adult cattle with 2-3 kg of dry fodder per day. The remaining, 28 % of farmers fed their cattle 4-5 kg dry fodder per day (Table 1). Previous literature says that the majority of the farmers fed their animals with the agriculture byproducts like sugarcane tops and hay to their animals; whereas 41 percent of the farmers fed cultivated the green fodder for their dairy animals (Akila and Sakthivel, 2012) [1]. The cost of concentrate feeds plays a very vital in the expenditure of dairy farming. The quantity of concentrate fed to dairy animals was categorized into three types, 1-2 kg, 2.5-3.5 kg, and 4-7 kg per day. The majority of respondents (41.33%) fed 2.5-3.5 kg of concentrate per day followed by 33.33 % of farmers fed 1-2kg of concentrate per day and the remaining 25.33% farmers fed 4-7 kg per day depending upon milk production performances of animals and availability of feed resources (Table 1).

Disease prevention and control
The prevention of disease occurrence in dairy farming is a very important aspect of biosecurity measures. Most of the respondents (98.66%) were aware of Foot-and-Mouth disease vaccination and regularly doing vaccination twice in the year thereby effectively utilizing the nationwide FMD vaccination program. Besides, farmers also do area-specific vaccination schedules against contagious diseases like Anthrax, and hemorrhagic septicemia. Similar findings were also reported by Tiwari et al. (2009) [13], Thirunavukarasu & Kathiravan, (2010) [12], and Akila and Sakthivel, (2012) [1]. The majority of farmers (90.66%) regularly doing deworming to control parasitic disorders and improve growth in the young calves and the remaining 9.34 % of farmers not aware of the importance of deworming in dairy farming (Table 1). Our results were almost similar to the findings of Akila and Sakthivel, (2012) [1]; they found that majority (88 percent) of the dairy farmers were utilizing the facilities of deworming and vaccination against contagious diseases in the livestock camps organized by the State Animal Husbandry Department.

Almost all farmers involved in this study were following artificial insemination (AI) techniques to breed their animals. However, our result was contradicting with Akila and Sakthivel, (2012) [1] they reported that 60% of the farmers followed AI, 16% practiced both AI and natural service and 22 % of the respondents practiced natural service alone to breed the animals. Of 75 respondents included in the study, 42.67% of farmers utilized cow dung as manure for their agricultural uses. The remaining 57.33 % of farmers sell the manure at Rs. 1000 to 3000 depending upon market demands (Table 1). Further, the majority of the farmers (72%) utilize their family members for daily routines of dairy farming activities and the remaining farmers engage the casual labour range from 1 to 8 labours depending upon herd size and season of works.

Constraints faced by the dairy farmers
The majority of farmers felt that the low cost for milk sale price, low fat and SNF content in milk, low milk yield, and high cost of concentrate, anestrus the major constraints faced by the dairy farmers. The next major constraints faced by the respondents were non-availability of green fodder and grazing land, high occurrence of reproductive disorders like silent oestrus, late puberty, repeat breeder and postpartum anestrums, frequent occurrence of mastitis, ectoparasitic infestation, water scarcity, and high cost of paddy straw. A similar kind of results was reported by Akila & Sakthivel, (2012) [1]; Karthikeyan et al. (2018) [1] and Kavithaa et al. (2020) [4]. Karthikeyan et al. 2018 [1] reported that low milk price was ranked as the topmost constraint followed by non-availability of subsidized feed, fodder, and other supplements.
as other constraints faced by the dairy farmers. Similarly, previous literature found that the high cost of the feed, absence of organized milk marketing channels, and lack of veterinary services are other major constraints faced by the farmers (Ganai et al. 2008; Patil et al. 2009; Meganathan et al. 2010) [2,6,9].

In conclusion, our study results showed the general management practices followed by dairy farmers on feeding, breeding, health care, and animal production performances of dairy animals of Tamil Nadu. Further, our study also highlighted the major constraints like the low cost for milk sale price, low fat and SNP content in milk, low milk yield, high cost of concentrate feed, and high occurrence of reproductive disorders are the constraints faced by the dairy farmers of Tamil Nadu. To overcome these problems, we have to carry out the extension activities in dairy farming in such a way to teach farmers on the recent interventions and technical knowledge on scientific dairy farm management to develop dairy farming into a profitable dairy enterprise.

Table 1: Profile of common managemental practices followed by farmers on dairy farming system in Tamil Nadu

| Particulars       | Category               | Frequency | Percentage (%) |
|-------------------|------------------------|-----------|----------------|
| Green fodder      | 15-20 kg               | 48        | 64.00          |
|                   | 20-30 kg               | 27        | 36.00          |
| Dry fodder        | 2-3 kg                 | 54        | 72.00          |
|                   | 4-5 kg                 | 21        | 28.00          |
| Concentrate       | 1-2 kg                 | 25        | 33.33          |
|                   | 2.5-3.5 kg             | 31        | 41.33          |
| Vaccination       | Not aware              | 7         | 9.33           |
| Deworming         | Not aware              | 7         | 9.33           |
| Herd size         | 2 - 4 numbers          | 21        | 28.00          |
|                   | 5 - 8 numbers          | 36        | 48.00          |
|                   | above 9 numbers        | 18        | 24.00          |
| Breed             | HF cross               | 33        | 44.00          |
|                   | Jersey cross           | 64        | 85.33          |
|                   | Non-descript cow       | 7         | 9.33           |
| Manure            | Own use                | 32        | 42.67          |
|                   | Sales                  | 43        | 57.33          |
| Labour engagement | Family members         | 54        | 72.00          |
|                   | Casual labour          | 21        | 28.00          |

Table 2: Milk production performance of dairy animals

| Particulars         | Category       | Frequency | Average | Range |
|---------------------|----------------|-----------|---------|-------|
| Milk yield (litres) | HF cross       | 24        | 11.83   | 6-20  |
|                     | Jersey cross   | 61        | 8.57    | 4-15  |
|                     | Non-descript cow| 9         | 5.2     | 1-10  |
| Milk sale price (Rs)| Cow milk       | 75        | 31.18   | 22-50 |

Competing Interests
The authors declare that they have no competing interests.

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