Management practices followed by dairy farmers in rural Punjab

N Kaur* and J S Toor

Department of Economics, Punjabi University, Patiala, Punjab- 147002
*Corresponding Author e-mail: kaleronenapinder@gmail.com

Journal of Livestock Science (ISSN online 2277-6214) 13: 164-170
Received on 7/4/22; Accepted on 18/5/22; Published on 10/6/22
doi. 10.33259/JLivestSci.2022.164-170

Abstract

The breeding, feeding, housing and healthcare management practices play an important role in attaining the full potential of dairying. The present study aims to investigate about the management practices, such as breeding management, healthcare management, feeding management and housing management, followed by the dairy farmers in rural Punjab. Using multi-stage sampling technique, the present study is based on primary data, collected through a detailed schedule from 420 dairy farmers belonging to different farm size categories from 21 villages situated in three different agro-climatic zones (Shivalik-Foothills, Central Plains and South-West Dry zones) of Punjab state. The results show that a majority of the dairy farmers prefer to breed their dairy animals using Artificial Insemination (using semen of Indian bulls) for breeding by a doctor, vaccinate animals against Foot & Mouth Disease, do deworming of calves against internal parasites but not that of adult animals, ignore disinfecting dairy shed, provide bedding material to new born calves and keep their pregnant dairy animals in the same shed along with other dairy animals. Most of them have the facility of shed with slanted roof of asbestos material for housing their dairy animals in single row system. They feed a mixture of their self-cultivated green fodder, dry fodder and concentrates to dairy animals, preferring stall feeding over grazing.

Keywords: Rural dairy farmers; Artificial Insemination; Calves; Deworming; Foot & Mouth Disease
Introduction

Dairying has occupied a predominant place in rural economy. The entire structure of village economy rests upon agriculture and dairying. The sector involves millions of resource poor farmers, for whom critical livelihood, economic stability and sustainable farming has been ensured by animal ownership. Livestock sector is originated as critical sub-sector of agriculture in Punjab. Livestock population has declined to 7331.27 thousand in 2007 from 8607.50 thousand in 2003, showing the decline of approximately 15 per cent. But, then it has increased to 8117.10 thousand in 2012 (Livestock Census, 2012). Milk production in the state stands at 13347 thousand tonnes in 2019-20. With the increase in milk production in Punjab, the per capita availability of milk has also shown a significant rise over the decades. Per capita availability of milk has increased to 1225 grams per day in 2019-20 from 870 grams per day in 2000-01 (Statistical Abstract of Punjab, 2020). The breeding, feeding, housing and healthcare management practices play an important role in attaining the full potential of dairying. A good number of studies, such as Sabapara et al. (2010), Malsawmdawngliana and Rahman (2016), Dhaliwal and Dhillon (2017), Sreedhar et al. (2017), Patel et al. (2018), Kumar et al. (2019) and Patel et al. (2019), have been undertaken to discuss the feeding, breeding, housing and healthcare management practices adopted by the dairy farmers. Dairy farmers are not getting good economic return (Sharma & Singh, 2020) and continued adoption of traditional practices is one of the factor (Patel et al 2016).

A majority of the dairy farmers have used Artificial Insemination (A.I.) for breeding their animals, have vaccinated their dairy animals against Foot and Mouth Disease, have dewormed their milk animals, and have provided conventional type of housing with concrete floor. Only a few dairy farmers have fed their dairy animals all three rations, viz., green fodder, concentrate and dry fodder. The present study aims to investigate about the management practices, such as breeding management, healthcare management, feeding management and housing management, followed by the dairy farmers in rural Punjab.

Material and Methods

The present study is based on primary data, collected through a detailed schedule from 420 dairy farmers belonging to different farm size categories from 21 villages (using a multi-stage sampling technique to select the villages and dairy farmers) situated in three different agro-climatic zones (Shivalik-Foothills, Central Plains and South-West Dry zones) of Punjab state. Standard statistical tools like mean values and proportions have been used for analysis.

Fig 1: showing villages of Punjab selected for survey
Results and Discussion

Breeding Practices followed by dairy farmers in rural Punjab

The reproductive performance in dairy cattle is important variable for its economic success. The reproductive efficiency is a major area of concern for the farmers when using Natural Services (N.S.) and Artificial Insemination (A.I.). Table 1 shows the distribution of dairy farmers as per the adoption of breeding practices in Punjab. Out of all, 80 (19.05 per cent) dairy farmers resort to natural services for inseminating their cattle, while 340 (80.95 per cent) dairy farmers like to choose artificial insemination over natural services. This scenario is similar across the regions, except South-West Dry region. In South-West Dry region, 33 (33 per cent) dairy farmers prefer natural services and 67 (67 per cent) prefer artificial insemination for inseminating their dairy animals. These findings are in conformity with Sabapara et al. (2010), Malsawmdawngliana & Rahman (2016), Dhaliwal & Dhillon (2017) and Kumar et al. (2019). According to Sabapara et al. (2010), around 96 per cent of the dairy farmers have artificially inseminated their milch animals in south Gujarat. The findings of Malsawmdawngliana & Rahman (2016) have shown that 98 per cent of the dairy farmers have resorted to artificial insemination of their cattle in Mizoram. The study of Dhaliwal & Dhillon (2017) has revealed that 65 per cent of the dairy farmers in rural areas and 85 per cent of the dairy farmers in urban areas have preferred artificial insemination of their dairy animals in Bathinda district of Punjab. Around 80 per cent of the dairy farmers have resorted to artificial insemination over natural services in western Uttar Pradesh as per the study of Kumar et al. (2019). However, Sreedhar et al. (2017) have found opposite results in which 81 per cent of the dairy farmers have preferred natural services over artificial insemination of their dairy animals.

The technique of inseminating dairy animals requires adequate knowledge and experience. Improper artificial insemination can negate all other efforts to obtain conception. Out of 340 dairy farmers preferring artificial insemination over natural services, 331 (97.35 per cent) dairy farmers prefer veterinarian for artificial insemination procedure, while in case of 9 (2.65 per cent) dairy farmers, artificial insemination procedure is performed by farmers themselves. This scenario is similar across the regions with a minor percentage changes here and there.

Farmers, who want to make the most of the genetic gain for the renewal of their herd, often prefer to choose artificial insemination over natural services. They, therefore, use imported semen on their cows. As much as 184 (54.12 per cent) dairy farmers use the semen of Indian bulls. Remaining 156 (45.88 per cent) dairy farmers prefer imported semen for artificial insemination procedure.

In Shivalik-Foothills region, the maximum number (108) of dairy farmers prefers to use imported semen for artificial insemination procedure. In Central Plains region and South-West Dry region, the maximum number (58 & 45 respectively) uses the semen of Indian bulls for artificial insemination.

Healthcare Management Practices followed by Dairy Farmers

Table 2 provides the information regarding healthcare management practices, such as vaccination against Foot & Mouth Disease, deworming of calves, deworming of adult animals, shed disinfection, bedding material for calves and separate shed for pregnant dairy animals, followed by the dairy farmers in rural Punjab. Foot & mouth disease is a severe, highly contagious viral disease of cattle. Across the regions, almost all dairy farmers vaccinate their dairy animals against Foot & Mouth Disease. These findings are in conformity with the results of Sabapara et al. (2010), Patel et al. (2018) & Patel et al. (2019). Deworming plays an important role in reducing the internal parasites. Ideally, the deworming should start from the first week of birth of calf. The distribution of dairy farmers on the basis of deworming of calves reveals that as much as 178 (80.91 per cent) dairy farmers from Shivalik-Foothills region and 90 (90 per cent) each from Central Plains region and South-West Dry region resort to the practice of deworming of calves after birth. Regarding deworming of adult animals, 151 (68.64 per cent) from Shivalik-Foothills region do not deworm their adult animals. Remaining 37 (16.82 per cent) do deworming of adult animals after every three months, followed by 29 (13.18 per cent) doing half-yearly deworming and just 3 (1.36 per cent) do yearly deworming of adult animals. Out of all, 67 (67 per cent) and 72 (72 per cent) dairy farmers from Central Plains region and South-West Dry region, respectively, do not deworm their adult animals. The highest number (17, 17 per cent) of dairy farmers from Central Plains region do half-yearly deworming and lowest (5, 5 per cent) of them do yearly deworming of adult animals. The maximum number (18, 18 per cent) of the dairy farmers from South-West Dry region does half-yearly deworming of adult animals, followed by 5 (5 per cent each) doing deworming after everythree months and yearly respectively. The findings of the study are supported by the results of Malsawmdawngliana &Rahman (2016) However, Sabapara et al. (2010) and Patel et al. (2018) have found the results not in conformity with the findings of present study.

The effective control of the infectious diseases is important for animal health. This mainly relies on the maintenance of healthy environment involving cleaning and disinfection. Across the regions, 185 (84.09 per cent) dairy farmers from Shivalik-Foothills region, 82 (82 per cent) from Central Plains region and 89 (89 per cent) dairy

farmers from South-West Dry region do not disinfect the dairy shed at all. This result is in contrast with the study of Patel et al. (2018). The information on provision of bedding material shows that, generally, straw is used for making bedding material for young calf as it provides thermal insulation to calves. In Shivalik-Foothills region, 216 (98.18 per cent) dairy farmers provide bedding material for new born calves and just 4 (1.82 per cent) do not do so. As much as 87 (87 per cent) dairy farmers from Central Plains region provide the bedding material to calves and remaining 13 (13 per cent) do not provide this facility to their calves. In South-West Dry region, 90 (90 per cent) dairy farmers are providing the facility of bedding to calves and just 10 (10 per cent) do not provide bedding to the new born calves.

Animals of advance pregnancy must be kept separated at dried-off floor to avoid udder troubles in subsequent lactation. In Shivalik-Foothills region, 15 (6.82 per cent) dairy farmers keep pregnant animals in separate shed and 205 (93.18 per cent) do not do so. Just 2 (2 per cent) and 3 (3 per cent) dairy farmers in Central Plains region and South-West Dry region has the facility of serrate shed for pregnant dairy animals.

**Feeding Practices followed by Dairy Farmers**

Feeding is one of the important aspects of animal husbandry. A balanced animal feed is a proper combination of proteins, carbohydrates, fats, minerals and vitamins. A good animal feedstuff is balanced in nutrients, clean and fresh, and free from toxins. However, there is shortage of feed and fodder in India, along with ineffective feed quality control and poor-quality feed (Kumar et al., 2019).
Table 1: Breeding practices followed by dairy farmers in rural Punjab

| Sr. No. | Breeding Practices | Shivalik-Foothills region | Central Plains region | South-West Dry region | Sampled |
|---------|--------------------|---------------------------|-----------------------|-----------------------|---------|
|         |                    | No. | %     | No. | %     | No. | %     | No. | %     |       |
| 1       | Insemination Method| Natural | 31  | 14.09 | 16  | 16.00 | 33  | 33.00 | 80  | 19.05 |
|         |                    | Artificial | 189 | 85.91 | 84  | 84.00 | 67  | 67.00 | 340 | 80.95 |
|         | Total              | 220 | 100.00 | 100 | 100.00 | 100 | 100.00 | 420 | 100.00 |

Table 2: Healthcare Management Practices followed by Dairy Farmers

| Sr. No. | Healthcare Practices | Shivalik-Foothills region | Central Plains region | South-West Dry region | Sampled |
|---------|----------------------|---------------------------|-----------------------|-----------------------|---------|
|         |                      | No. | %     | No. | %     | No. | %     | No. | %     |       |
| 1       | Vaccination against Foot and Mouth Disease | Yes | 220 | 100.00 | 99  | 99.00 | 98  | 98.00 | 417 | 99.29 |
|         |                      | No | 0  | 0.00 | 1  | 1.00 | 2  | 2.00 | 3  | 0.71 |
|         | Total                | 220 | 100.00 | 100 | 100.00 | 100 | 100.00 | 420 | 100.00 |
| 2       | Deworming of Calves | Yes | 178 | 80.91 | 90  | 90.00 | 90  | 90.00 | 358 | 85.24 |
|         |                      | No | 42 | 19.09 | 10  | 10.00 | 10  | 10.00 | 62  | 14.76 |
|         | Total                | 220 | 100.00 | 100 | 100.00 | 100 | 100.00 | 420 | 100.00 |
| 3       | Deworming of Adult Animals | No | 151 | 68.64 | 67  | 67.00 | 72  | 72.00 | 290 | 69.05 |
|         |                      | After 3 months | 37 | 16.82 | 11  | 11.00 | 5  | 5.00 | 53  | 12.62 |
|         |                      | Half-yearly | 29 | 13.18 | 17  | 17.00 | 18  | 18.00 | 64  | 15.24 |
|         |                      | Yearly | 3  | 1.36 | 5  | 5.00 | 5  | 5.00 | 13  | 3.10 |
|         | Total                | 220 | 100.00 | 100 | 100.00 | 100 | 100.00 | 420 | 100.00 |
| 4       | Disinfection of Shed | KMNO4 | 8  | 3.64 | 0  | 0.00 | 1  | 1.00 | 9  | 2.14 |
|         |                      | Phenyl | 15 | 6.82 | 13  | 13.00 | 6  | 6.00 | 34  | 8.10 |
|         |                      | Tick Spray | 12 | 5.45 | 5  | 5.00 | 4  | 4.00 | 21  | 5.00 |
|         |                      | Not Disinfected | 185 | 84.09 | 82  | 82.00 | 89  | 89.00 | 356 | 84.76 |
|         | Total                | 220 | 100.00 | 100 | 100.00 | 100 | 100.00 | 420 | 100.00 |
| 5       | Bedding Material for New Born Calf | Yes | 216 | 98.18 | 87  | 87.00 | 90  | 90.00 | 393 | 93.57 |
|         |                      | No | 4  | 1.82 | 13  | 13.00 | 10  | 10.00 | 27  | 6.43 |
|         | Total                | 220 | 100.00 | 100 | 100.00 | 100 | 100.00 | 420 | 100.00 |
| 6       | Separate Shed for Pregnant Women | Yes | 15 | 6.82 | 2  | 2.00 | 3  | 3.00 | 20  | 4.76 |
|         |                      | No | 205 | 93.18 | 98  | 98.00 | 97  | 97.00 | 400 | 95.24 |
|         | Total                | 220 | 100.00 | 100 | 100.00 | 100 | 100.00 | 420 | 100.00 |

Source: Field Survey, 2019
**Table 3: Housing Practices followed by Dairy Farmers**

| Sr. No. | Housing Practices | Housing Practices followed by Dairy Farmers | Shivalik-Foothills region | Central Plains region | South-West Dry region | Sampled |
|---------|-------------------|---------------------------------------------|--------------------------|-----------------------|-----------------------|---------|
|         |                   | No.  | %    | No.  | %    | No.  | %    |
| 1       | Housing of Dairy Animals |     |      |      |      |      |      |
|         | Shed              | 204  | 92.73| 95   | 95.00 | 92   | 92.00 |
|         | Under Trees       | 16   | 7.27 | 5    | 5.00  | 8    | 8.00  |
|         | Total             | 220  | 100.00 | 100.00 | 100.00 | 100.00 | 420  |
| 2       | Floor             |      |      |      |      |      |      |
|         | Katcha            | 45   | 20.45| 24   | 24.00 | 45   | 45.00 |
|         | Concreted         | 169  | 76.82| 74   | 74.00 | 49   | 49.00 |
|         | Matted            | 6    | 2.73 | 2    | 2.00  | 6    | 6.00  |
|         | Total             | 220  | 100.00 | 100.00 | 100.00 | 100.00 | 420  |
| 3       | Roof of Shed      |      |      |      |      |      |      |
|         | Slanted           | 151  | 74.02| 50   | 52.63 | 70   | 76.09 |
|         | Plain-top         | 53   | 25.98| 45   | 47.37 | 22   | 23.91 |
|         | Total             | 204  | 100.00 | 95    | 100.00 | 92   | 100.00 |
| 4       | Roofing Material of Shed |      |      |      |      |      |      |
|         | Asbestos Sheets   | 129  | 63.24| 48   | 50.53 | 48   | 52.17 |
|         | Tiles             | 59   | 28.92| 36   | 37.89 | 41   | 44.57 |
|         | Thatched Roof     | 16   | 7.84 | 11   | 11.58 | 3    | 3.26  |
|         | Total             | 204  | 100.00 | 95    | 100.00 | 92   | 100.00 |
| 5       | Shed              |      |      |      |      |      |      |
|         | Single            | 206  | 93.64| 99   | 99.00 | 94   | 94.00 |
|         | Head-to-Head      | 14   | 6.36 | 1    | 1.00  | 6    | 6.00  |
|         | Total             | 220  | 100.00 | 100.00 | 100.00 | 100.00 | 420  |

Source: Field Survey, 2019

**Table 4: Feeding Practices followed by Dairy Farmers**

| Sr. No. | Feeding Practices | Feeding Practices followed by Dairy Farmers | Shivalik-Foothills region | Central Plains region | South-West Dry region | Sampled |
|---------|-------------------|---------------------------------------------|--------------------------|-----------------------|-----------------------|---------|
|         |                   | No.  | %    | No.  | %    | No.  | %    |
| 1       | Feeding System    |      |      |      |      |      |      |
|         | Stall Feeding     | 220  | 100  | 100  | 100  | 100  | 100  |
|         | Total             | 220  | 100  | 100  | 100  | 100  | 100  |
| 2       | Ration Mixture of Green Fodder & Dry Fodder |      |      |      |      |      |      |
|         | Yes               | 217  | 98.64| 93   | 93.00 | 87   | 87.00 |
|         | No                | 3    | 1.36 | 7    | 7.00  | 13   | 13.00 |
|         | Total             | 220  | 100.00 | 100.00 | 100.00 | 100.00 | 420  |
| 3       | Ration Mixture of Green Fodder & Concentrates |      |      |      |      |      |      |
|         | Yes               | 176  | 80.00| 68   | 68.00 | 75   | 75.00 |
|         | No                | 44   | 20.00| 32   | 32.00 | 25   | 25.00 |
|         | Total             | 220  | 100.00 | 100.00 | 100.00 | 100.00 | 420  |
| 4       | Ration Mixture of Green Fodder, Dry Fodder & Concentrates |      |      |      |      |      |      |
|         | Yes               | 175  | 79.55| 63   | 63.00 | 73   | 73.00 |
|         | No                | 45   | 20.45| 37   | 37.00 | 27   | 27.00 |
|         | Total             | 220  | 100.00 | 100.00 | 100.00 | 100.00 | 420  |
| 5       | Cultivation of Green Fodder |      |      |      |      |      |      |
|         | Yes               | 181  | 82.27| 83   | 83.00 | 80   | 80.00 |
|         | No                | 39   | 17.73| 17   | 17.00 | 20   | 20.00 |
|         | Total             | 220  | 100.00 | 100.00 | 100.00 | 100.00 | 420  |

Source: Field Survey, 2019
Table 4 provides the information regarding feeding practices followed by the dairy farmers in Punjab. Feeding system includes stall feeding and grazing. Stall feeding is most popular these days. Moreover, the grazing lands are no longer exists in the state of Punjab. All dairy farming households across the regions prefer stall feeding over grazing. This result is in line with the findings of Malsawmdawngliana et al. (2016) and Kumar et al. (2019), who have found that all almost all dairy farmers do stall feeding of their animals.

Region-wise data on ration mixture of green fodder and dry fodder reveal that 217 (98.64 per cent) dairy farmers feed their dairy animals with this mixture and just 3 (1.36 per cent) dairy farmers feed one of them. The ration mixture of green and dry fodder is fed by 93 (93 per cent) dairy farmers in Central Plains region. In South-West Dry region, green and dry fodder mixture is fed by 87 (87 per cent) dairy farmers and 13 (13 per cent) dairy farmers do not feed mixture of green and dry fodder to their animals.

The ration mixture of green fodder and concentrates is fed to the dairy animal by 176 (80 per cent), 68 (68 per cent) and 75 (75 per cent) dairy farmers from Shivalik-Foothills region, Central Plains region and South-West Dry region respectively. On contrary, 44 (20 per cent), 32 (32 per cent) and 25 (25 per cent) dairy farmers are not feeding dairy animals concentrate along with green fodder from Shivalik-Foothills region, Central Plains region and South-West Dry region respectively. Regarding the ration mixture of green fodder, dry fodder and concentrates, 175 (79.55 per cent) dairy farmers from Shivalik-Foothills region, 63 (63 per cent) dairy farmers from Central Plains region and 73 (73 per cent) dairy farmers from South-West Dry region are feeding this ration mixture to their dairy animals. Green fodder is one of the main components of the ration mixture of the dairy animals. A majority, i.e. around four-fifth, of the dairy farmers are cultivating green fodder themselves for meeting the nutritional requirement of their animals. These findings are in line with the result of Kumar et al. (2019), in which they have found that a majority of the dairy farmers are themselves cultivating green fodder for their animals.

**Conclusion**

A majority of the dairy farmers prefer to breed their dairy animals using Artificial Insemination (using semen of Indian bulls) for breeding by a doctor, vaccinate animals against Foot & Mouth Disease, do deworming of calves against internal parasites but not that of adult animals, ignore disinfecting dairy shed, provide bedding material to new born calves and keep their pregnant dairy animals in the same shed along with other dairy animals in the shed with slanted roof of asbestos material for housing their dairy animals in single row system. They feed a mixture of their self-cultivated green fodder, dry fodder and concentrates to animals, preferring stall feeding over grazing. It is suggested to provide scientific knowledge regarding the adoption of better dairy management practices through training courses organised by the government institutions.

**References**

1) 19th Livestock Census, 2012. Government of India, Ministry of Agriculture and Farmers Welfare, Department of Animal Husbandry, Dairying and Fisheries, New Delhi.
2) Dhaliwal APS and Dhillon SS, 2017. Management practices followed by dairy farmers in rural and urban areas of Bathinda district in Punjab. Journal of Krishi Vigyan, 6(1): 124-127.
3) Kumar J, Singh R, Sommath, Dayal R, Singh H and Singh S, 2019. Studies on feeding and breeding practices of dairy animal in western Uttar Pradesh. Journal of Pharmacognosy and Phytochemistry, 3: 29-36.
4) Malsawmdawngliana Rand Rahman S, 2016. Management practices followed by the dairy farmers of Mizoram, India. Journal of Livestock Science, 7: 220-225.
5) Patel JH, Prajapati KB, Sheikh AS, Patel MD, Chaudhari SS, 2016. Traditional feeding practices adopted by professional breeders of Kankrej cattle in Banaskantha district of Gujarat state. Journal of Livestock Science 7: 49-53
6) Patel PC, Sabapara GP and Sorathiya LM, 2019. Health care management practices followed by dairy animal owners in Tribal areas of Gujarat. Indian Journal of Animal Production and Management, 35(1-2): 54-58.
7) Patel PD, Chauhan HD, Srivastava AK, Ankuya KJ, Prajapati RK, Paregi AB and Gupta JP, 2018. Healthcare management practices followed by dairy farmers of Aravalli district of North Gujarat. International Journal of Current Microbiology and Applied Sciences, 7(11): 1129-1135.
8) Prasad K, Savale S, Mahantesh MT, Pavan M, Barman D and Abraham J, 2017. Socio-economic profile and constraints faced by dairy farmers of Wayanad district, India. International Journal of Current Microbiology & Applied Sciences, 6(6): 870-874.
9) Sabapara GP, Desai PM, Singh RR and Kharadi VB, 2010. Breeding and health care management status of dairy animals in the tribal area of South Gujarat. Indian Journal of Animal Science, 80 (11): 1148-51.
10) Sharma JK, Singh NK 2020. Economic studies on unorganized dairy farms in Jaipur region of Rajasthan. Journal of Livestock Science 11: 127-132 doi 10.33259/JLivestockSci.2020.127-132
11) Sreedhar S, Reddy A N, Sudhakar B V and Babu P R, 2017. Breeding management practices and reproductive disorders in indigenous cattle and buffaloes. Global Journal of Bio-Science and Biotechnology, 6(3): 504-508.
12) Statistical Abstract of Punjab, 2020. Government of Punjab, Economic and Statistical Organisation, Punjab.