**Sumi Princess C**
Division of Livestock Economics, Statistics and Information Technology, ICAR- Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh, India

**Dinesh Kumar**
Division of Livestock Economics, Statistics and Information Technology, ICAR- Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh, India

**Sandeep Saran**
ICAR- Central Avian Research Institute, Izatnagar, Uttar Pradesh, India

**Sanjay Kumar**
Division of Livestock Economics, Statistics and Information Technology, ICAR- Indian Veterinary Research Institute, Izatnagar, India

**Chitra Juniwal**
Division of Livestock Economics, Statistics and Information Technology, ICAR- Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh, India

**Maria Anto Dani Nishanth J**
Division of Veterinary Public Health and Epidemiology, ICAR- Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh, India

**Dinesh D**
Division of Veterinary Microbiology, ICAR- Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh, India

**Corresponding Author:**
**Sandeep Saran**
ICAR- Central Avian Research Institute, Izatnagar, Uttar Pradesh, India

# Study on socio-economic profile of dairy farmers in Tamil Nadu

## Sumi Princess C, Dinesh Kumar, Sandeep Saran, Sanjay Kumar, Chitra Juniwal, Maria Anto Dani Nishanth J and Dinesh D

**Abstract**
The study was undertaken to analyse the socio-economic status of dairy farmers in Tamil Nadu. Primary data were collected from two districts with the help of a structured interview schedule by personally interviewing the farmers during the year 2022-2023 and chi-square test was used to draw significant conclusions regarding the socioeconomic profile of respondents. Most of the dairy farmers in the study area were small, rearing 2-8 breedable bovine and having average herd size of five animals. The socio-economic profile of dairy farmers in the study area shows that majority of farmers were middle-aged (59%), having educational qualification up to primary level (39.5%) with medium-sized family. Most of them had marginal landholdings (64.5%) and 57% of respondents rely on agriculture as main occupation and livestock as subsidiary occupation. Most of the farmers belonged to OBC (81%) and followed Hinduism (75.5%). Further, the study revealed that majority of respondents belonged to low annual income group.

**Keywords:** Chi-square test, dairy farmers, socio-economic status, Tamil Nadu

## Introduction

India is the world leader in total milk production, achieving an annual production of 209.96 million tonnes during the year 2020-21[1]. Dairy sector significantly contributes to the creation of opportunities for sustainable income, notably self-employment, for a significant portion of the rural and urban population, particularly women who actively engage in the management of livestock. Milk and milk products account for a significant portion of the value of output from the livestock sub-sector, rising from less than 50% in 1950-51 to 66.63% in 2018-19 (at current prices) [2]. In terms of commodity value, milk has become the most valuable agricultural commodity. Most of the milk in the country is produced by small, marginal farmers and landless labourers [1]. The total cattle and buffalo population was 193.46 million and 109.85 million in India (BAHS, 2021) [3]. The population of crossbred (CB)/exotic cattle increased by 29.3%, over the previous livestock population census 2012 (20th livestock census) [4]. The population of exotic/crossbred cattle is highest in the state of Tamil Nadu which is about 7.72 million (BAHS, 2021) [3]. Also, the production of milk from exotic/crossbred cattle is 8.84 million tonnes in Tamil Nadu which is highest among all states of India (BAHS, 2021) [3]. The purpose of study was to assess the socio-economic profile of dairy farmers in Tamil Nadu who choose dairy production as a means of improving their living standards.

## Materials and Methods

The study on socio-economic characteristics of dairy farmers was conducted in Tamil Nadu during year 2022-2023. A combination of purposive and multistage random sampling technique was adopted for the selection of study area in Tamil Nadu. For the present study, two districts were selected based on bovine population density index, one from the northern part of Tamil Nadu, namely, Tiruvannamalai with high bovine population density index and other from the southern part of the state, Thoothukudi with low bovine population density index. A multistage random sampling technique was adopted for the selection of taluks, villages and households. Two taluks were selected from each district, five villages were

selected from each

taluk and from each village 10 dairy farmers rearing at least 2 breedable bovine were selected randomly. Thus, a total of 200 households were covered in the survey from a total of 20 villages in 4 taluks from 2 districts of the state Tamil Nadu. A total of 1156 animals, comprising of 134 non-descript cattle, 725 crossbred cattle and 297 buffaloes were covered in the survey. The dairy farmers were classified into small (2-8 breedable bovine), medium (8-14 breedable bovine) and large farmers (14-20 breedable bovine) based on herd size. Data were collected through personal interview and subjected to chi-square test using Statistical Package for the Social Sciences (SPSS for Windows, Version 21.0; SPSS Inc., USA) to draw significant conclusions regarding the socioeconomic profile of respondents with respect to herd size.

**Results and Discussion**

The dairy farmers were classified into small, medium and large farmers based on herd size (Table 1). The majority of the respondents in the study area were small farmers (73.5%), followed by medium (19%) and large farmers (7.5%).

Table 2 depicts the average number of animals per household for different categories. On average, a household in the study area owned 3.195 crossbred cows, 0.515 non-descript cow, 1.2 buffaloes, 0.43 crossbred heifers, 0.155 non-descript heifers, and 0.28 buffalo heifers. The result shows that most of the farmers in the study area preferred rearing crossbred cattle over non-descript cattle and buffaloes. The estimated average herd size per household was 5.78, which was in agreement with the findings of Karthikeyan et al. (2018) [5] in a study in Namakkal district of Tamil Nadu.

The dairy farmers in the study area were between the age of 24 and 75 years, with an average age of 47.08 years. The data presented in table 3 reveals that majority of the respondents were middle aged (59%), followed by young age (28%) and old age (13%) group. Application of Chi-square test revealed no significant difference between small, medium and large farmers in terms of age of the farmers. These results were in concurrence with Rajadurai et al. (2015) [6]; Pulla et al. (2021) [7] who reported that majority of dairy farmers in Tamil Nadu were in middle age group.

It can be observed from table 4 that majority of the dairy farmers were having educational qualification up to Primary level (39.5%) followed by High School level (31.5%), Higher Secondary level (14%), Graduate & above (11%) and Illiterate (4%). Chi-square test revealed significant difference between small, medium and large farmers in terms of education at $p<0.1$. The findings were in agreement with the results of Rajadurai et al. (2015) [6] who found that about 76.42 percent were educated. But the finding was in contrary with Gopi et al. (2020) [8]; Pulla et al. (2021) [7], who noted that majority of the dairy farmers were illiterate.

Majority (57%) of respondents had agriculture as the main occupation and dairy farming as a subsidiary occupation as presented in table 5. (27%) of dairy farmers were also daily wage earners or agricultural labourers and (12.50%) of dairy farmers were also shopkeepers, private drivers, or low-wage workers. Only 3.5% of the respondents had dairy farming as a sole source of income. Chi-square test revealed significant difference between small, medium and large farmers in terms of occupation at $p<0.05$. The results of Gopi et al. (2020) [8] support the findings that more than one half (51.67%) of the respondents had dairying along with agriculture.

Table 6 revealed that majority of the farmers (55%) were having medium sized family (5-7 people) followed by 42% of small sized family (2-4 people) and 3% of large sized family (8-10 people). No significant difference was found between small, medium and large farmers in terms of family size when chi-square test was used. More than three-fourths of the respondents belonged to family size of 5 members, according to Gopi et al. (2020) [8].

It was revealed from table 7 that most of the respondents (64.5%) in the study area were marginal (owning less than 2.5 acres of land) land holders. Average land holding was 2.12 acres. About 22.5% of the respondents were small land holders (2.5-5 acres) and 3.5 percent of the famers had semi medium land holdings. About 1.5 percent of the famers had landholding size ranging between 7.5 to 10 acres and significantly lesser proportion of respondents owned landholding of more than 10 acres (0.5% of the farmers, respectively) and 7.5% respondents were landless labourers. Chi-square test revealed significant difference between small, medium and large farmers in terms of land holdings at $p<0.01$. The results were in partial agreement with the findings of Rajadurai et al. (2015) [6] who found that majority of the dairy farmers in Villupuram district of Tamil Nadu were small farmers (56.09 percent) followed by medium (26.08 percent) and landless (21.4 percent) and average land holding was 1.96 acres.

The distribution of dairy farmers based on social group was presented in table 8. Majority of the dairy farmers in the study area belonged to OBC (81%) followed by SC (19%). Chi-square test revealed significant difference at $p<0.1$ between small, medium and large farmers in terms of social group or caste. The findings align with the results of Pulla et al. (2021) [7] who reported that more than half of the respondents belonged to Most Backward Caste category followed by Backward Caste, Scheduled Caste in north eastern zone of Tamil Nadu.

As per table 9, majority of the respondents (75.5%) were Hindu, followed by Christians (21%) and Muslims (3.5%). Chi-square test indicated no significant difference between small, medium and large farmers in terms of religion. The findings were in agreement with the findings of Sasidharan et al. (2023) [9] who reported that majority of the dairy farmers were Hindus, followed by Christians and Muslims in Kerala.

It was revealed from the table 10 that the majority of respondents (79.5%) belonged to the low-income category, followed by the medium and high-income groups. The average income from dairy farming was found to be 1.89 lakhs. Chi-square test revealed significant difference at $p<0.01$ between small, medium and large farmers in terms of farm income.

From the data presented in table 11, it was recorded that more than half (56%) of the respondents belonged to low-income group (1.5 to 4 lakhs), followed by medium and high-income group (38.5% and 5.5%, respectively). The average gross annual income was found to be 4.13 lakhs. Chi-square test revealed significant difference at $p<0.01$ between small, medium and large farmers in terms of annual income. About 40 per cent of the dairy farmers had a medium level of annual income i.e., 192 to 438 thousand followed by low category (35 percent) with an annual income of 67 to 191 thousand and 25% of the respondents had high level of income ranging from 439 to 840 thousand, according to Pulla et al. (2021) [7].

**Table 1:** Classification of dairy farmers based on herd size

| Farmers category | Criteria (no. of breedable bovine/ farm) | No. of respondents | Percentage (%) |
|---|---|---|---|
| Small | 2-8 | 147 | 73.5 |
| Medium | 8-14 | 38 | 19 |
| Large | 14-20 | 15 | 7.5 |
| Total | | 200 | 100 |

**Table 2:** Average herd size per household (N= 200)

| Breedable animals | Non-descript | Crossbred | Buffaloes |
|---|---|---|---|
| Parous animal | 0.515 | 3.195 | 1.2 |
| Heifer | 0.155 | 0.43 | 0.28 |
| Total | 0.67 | 3.625 | 1.485 |
| Grand total | 5.78 | | |

**Table 3:** Distribution of respondents according to their age

| Age (in years) | Farmers | | | |
|---|---|---|---|---|
| | Small (N=147) | Medium (N=38) | Large (N=15) | Pooled (N=200) |
| Young (24-41) | 41 (27.89) | 9 (23.68) | 6 (40) | 56 (28) |
| Middle (41-58) | 85 (57.82) | 25 (65.79) | 8 (53.33) | 118 (59) |
| Old (58-75) | 21 (14.29) | 4 (10.53) | 1 (6.67) | 26 (13) |
| Average age | 47.33 | 48.13 | 42.07 | 47.08 |
| Chi square test | 0.99$^{NS}$ | | | |

Figures in parentheses indicate percentage; $^{NS}$- Not significant

**Table 4:** Distribution of respondents according to their education

| Education | Farmers | | | |
|---|---|---|---|---|
| | Small (N=147) | Medium (N=38) | Large (N=15) | Pooled (N=200) |
| Illiterate (0) | 8 (5.44) | 0 (0) | 0 (0) | 8 (4) |
| Primary (1-7) | 65 (44.22) | 13 (34.21) | 1 (6.67) | 79 (39.5) |
| High school (8-10) | 44 (29.93) | 13 (34.21) | 6 (40) | 63 (31.5) |
| Higher secondary (11-12) | 16 (10.88) | 9 (23.68) | 3 (20) | 28 (14) |
| Graduation & above | 14 (9.53) | 3 (7.9) | 5 (33.33) | 22 (11) |
| Chi square test | 13.529* | | | |

Figures in parentheses indicate percentage; *- Significant at 10% level

**Table 5:** Distribution of respondents according to their occupation

| Occupation | Farmers | | | |
|---|---|---|---|---|
| | Small (N=147) | Medium (N=38) | Large (N=15) | Pooled (N=200) |
| Agriculture + Dairying | 80 (54.42) | 24 (63.16) | 10 (66.67) | 114 (57) |
| Daily wage earners (agri. labourers) + Dairying | 46 (31.29) | 8 (21.05) | 0 (0) | 54 (27) |
| Dairying | 2 (1.36) | 2 (5.26) | 3 (20) | 7 (3.5) |
| Others + dairying | 19(12.93) | 4 (10.53) | 2(13.33) | 25 (12.5) |
| Chi square test | 13.555** | | | |

Figures in parentheses indicate percentage; **- Significant at 5% level

**Table 6:** Distribution of respondents according to their family size

| Family size | Farmers | | | |
|---|---|---|---|---|
| | Small (N=147) | Medium (N=38) | Large (N=15) | Pooled (N=200) |
| Small (2-4) | 57 (38.78) | 17 (44.74) | 10 (66.67) | 84 (42) |
| Medium (5-7) | 87 (59.18) | 18 (47.37) | 5 (33.33) | 110 (55) |
| Large (8-10) | 3 (2.04) | 3 (7.89) | 0 (0) | 6 (3) |
| Average family size | 4.65 | 5 | 4.47 | 4.71 |
| Chi square test | 5.337 $^{NS}$ | | | |

Figures in parentheses indicate percentage; $^{NS}$- Not significant

**Table 7:** Distribution of respondents according to their land holding size

| Land holding (in acres) | Farmers | | | |
|---|---|---|---|---|
| | Small (N=147) | Medium (N=38) | Large (N=15) | Pooled (N=200) |
| Landless labour (0) | 15 (10.2) | 0 (0) | 0 (0) | 15 (7.5) |
| Marginal (<2.5) | 97 (65.99) | 27 (71.05) | 5 (33.33) | 129 (64.5) |
| Small (2.5-5) | 30 (20.41) | 10 (26.32) | 5 (33.33) | 45 (22.5) |
| Semi medium (5-7.5) | 4 (2.72) | 1 (2.63) | 2 (13.34) | 7 (3.5) |
| Medium (7.5-10) | 0 (0) | 0 (0) | 3 (20) | 3 (1.5) |
| Large (>10) | 1 (0.68) | 0 (0) | 0 (0) | 1 (0.5) |
| Average land holding | 1.92 | 1.99 | 4.43 | 2.12 |
| Chi square test | 35.286*** | | | |

Figures in parentheses indicate percentage; ***- Significant at 1% level

**Table 8:** Distribution of respondents according to the social group

| Social group | Farmers | | | |
|---|---|---|---|---|
| | Small (N=147) | Medium (N=38) | Large (N=15) | Pooled (N=200) |
| General | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| OBC | 113 (76.87) | 34 (89.47) | 15 (100) | 162 (81) |
| SC | 34 (23.13) | 4 (10.53) | 0 (0) | 38 (19) |
| ST | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Chi square test | 5.028* | | | |

Figures in parentheses indicate percentage; *- Significant at 10% level

**Table 9:** Distribution of respondents according to their religion

| Religion | Farmers | | | |
|---|---|---|---|---|
| | Small (N=147) | Medium (N=38) | Large (N=15) | Pooled (N=200) |
| Hindu | 104 (70.75) | 32 (84.21) | 15 (100) | 151 (75.5) |
| Christ | 36 (24.49) | 6 (15.79) | 0 (0) | 42 (21) |
| Muslim | 7 (4.76) | 0 (0) | 0 (0) | 7 (3.5) |
| Chi square test | 5.618 [NS] | | | |

Figures in parentheses indicate percentage; [NS]- Not significant

**Table 10:** Distribution of respondents according to their farm income

| Farm income (in lakhs) | Farmers | | | |
|---|---|---|---|---|
| | Small (N=147) | Medium (N=38) | Large (N=15) | Pooled (N=200) |
| Low (0.5-2.5) | 147 (100) | 12 (31.58) | 0 (0) | 159 (79.5) |
| Medium (2.5-4.5) | 0 (0) | 24 (63.16) | 10 (66.67) | 34 (17) |
| High (4.5-6.5) | 0 (0) | 2 (5.26) | 5 (33.33) | 7 (3.5) |
| Average farm income | 1.31 | 3.14 | 4.38 | 1.89 |
| Chi square test | 151.044*** | | | |

Figures in parentheses indicate percentage; ***- Significant at 1% level

**Table 11:** Distribution of respondents according to their gross annual income

| Gross annual income (in lakhs) | Farmers | | | |
|---|---|---|---|---|
| | Small (N=147) | Medium (N=38) | Large (N=15) | Pooled (N=200) |
| Low (1.5-4) | 106 (72.11) | 6 (15.79) | 0 (0) | 112 (56) |
| Medium (4-6.5) | 41(27.89) | 29 (76.32) | 7 (46.67) | 77 (38.5) |
| High (6.5-9) | 0 (0) | 3 (7.89) | 8 (53.33) | 11 (5.5) |
| Average annual income | 4 | 5.09 | 6.63 | 4.13 |
| Chi square test | 102.692*** | | | |

Figures in parentheses indicate percentage; ***- Significant at 1% level

**Conclusion**
Most of the dairy farmers in the study area were small, rearing 2-8 breedable bovine and having average herd size of five animals per household. Since, majority of the farmers in the study area are educated and middle aged having marginal landholdings, dairy farming can be regarded as a crucial source of livelihood and employment for this demographic. In the light of major findings of the study, the policymakers and implementers can design livestock development programs with targeted interventions to improve dairy farming practices and well-being of dairy farmers taking into account the differences in the socio-economic profile of dairy farmers.

**Acknowledgement**

**References**
1. Department of Animal Husbandry, Dairying and Fisheries. Annual Report 2021-22. Ministry of Fisheries, Animal Husbandry and Dairying, Government of India; c2022.
2. Department of Animal Husbandry, Dairying and Fisheries. Annual Report 2020-21. Ministry of Fisheries, Animal Husbandry and Dairying, Government of India; c2021.
3. Department of Animal Husbandry, Dairying and Fisheries. Basic Animal Husbandry Statistics. Government of India; c2021.
4. Livestock census. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture and Farmers Welfare, Government of India, New Delhi; c2019.
5. Karthikeyan S. Profile of the Dairy Farmers and the Constraints Faced by them in Utilizing different Dairy Service Delivery Systems. Int J Agric Sci. 2018;10(16):7000-7002.
6. Rajadurai A, Rajamanickam K, Kumeravelu N. Socio-economic profile of the dairy farmers in Villupuram district of Tamil Nadu. J Entomol Zool Stud. 2020;8(2):128-130.
7. Pulla S, Nisha PR, Subramonian S, Prabhu M, Thilakar P. Analysis of socio-economic profile of dairy farmers in the north eastern zone of Tamil Nadu. Pharma Innovation J. 2021;10(12):137-139.
8. Gopi RA, Manivannan MG, Sindhu MG, Soundararajan C. Socio-economic profile and constraints of dairy farmers in Cuddalore district of Tamil Nadu, India. Int J Curr Microbiol Appl Sci. 2020;9(04):1320-1326.
9. Sasidharan M, Kannan A, Joseph BA, Raji K, Sunanda C. Study on socio-economic status of dairy farmers in Kerala. Pharma Innovation J. 2023;12(5):394-398.