



## Cattle production system in doab area of Uttar Pradesh

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### ABSTRACT

The present study was undertaken for collecting base line information on cattle rearing pattern and identify, establishment of germplasm distribution network of Frieswal crossbred and zebu cattle under field conditions of Doab area. The study on socio-economic parameters revealed that the average age of dairy farmers was 51.31 years with range between 23–85 years. Occupation wise maximum (89%) households belonged to agriculture (farming) group followed by dairy (8%), service (2.5%) and business (0.5%). The average educational qualifications of animal owners were high school (24.5%). The average herd size was 2.89 dairy animals per household followed by 1.15 cattle and 1.75 buffalo per households in study area. A total of 95.58% crossbred cows were covered by artificial insemination and 4.42% were covered through both AI/natural services. The average number of services per cow was 1.75 per animal. Parity wise production of cattle was found highest ( $14.28 \pm 2.7$  kg) in 4<sup>th</sup> lactation and lowest ( $9.61 \pm 3.4$  kg) in 1<sup>st</sup> lactation followed by 5<sup>th</sup> ( $11.71 \pm 4.4$  kg), 2<sup>nd</sup> ( $10.21 \pm 3.0$  kg) and 3<sup>rd</sup> ( $9.70 \pm 2.9$  kg) lactation. The average milk production was 14.33 kg out of which, 7.36 kg per day was used for household's consumption. The rest of milk (12.24 kg) was sold to local milkman/purchaser for income. This study will be very helpful in improvement of breeding, feeding and healthcare management practices and to understand the production and consumption pattern of milk in the Doab area of Uttar Pradesh.

**Key words:** Cattle production, Reproductive problems, Sexed semen, Socio-economic

India's livestock sector is one of the largest in the world. Total livestock population in India is 512.05 million. Contribution of cattle is 190.9 million (37.28%) and Buffalo is 108.7 million (21.23%). India is producing about 155.5 million tonnes of milk. India ranks first in milk production in the world (19<sup>th</sup> Livestock Census, 2012). For the last several years, the main aim of dairy cattle breeding under field conditions was to improve production efficiency with genetic selection focused on increasing milk yield. As a result, milk production per cow is increasing under organized farm conditions, but under the rural conditions, the trend is entirely reverse. There are some practical reasons of concern for low production such as unavailability of superior germplasm, poor nutrition and declining ability to reproduce, increased incidence of health problems, and declining longevity in modern dairy cows. Keeping in view, the above-mentioned issues, present study was undertaken with the specific objectives: to conduct survey for collecting base line information in field conditions nearby Meerut and to identify and establish the semen distribution network of Frieswal crossbred and Zebu cattle under field conditions of Doab area.

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### MATERIALS AND METHODS

The present investigation was carried out in two blocks each of Meerut and Baghpat districts of Uttar Pradesh. From each of the selected blocks, five villages were selected, thus making a total of 20 villages from both the districts. From each of the selected villages, 10 farmers were selected for the present study making a total sample size of 200 respondent farmers. The data was categorised and coded according to location, occupation, education, family type, landholding, parity etc. The collected data were subjected to Analysis of Variance (ANOVA) using SPSS 20.0 version to study the effect of various factors viz., block, occupation, education, family type, land holding size and parity of animal on milk yield in both cattle and buffalo.

### RESULTS AND DISCUSSION

*Socio-economic profile of farmers:* The analysis of socio-economic status of farmers under the study area revealed that the average age of dairy farmers was 51.31 years with range between 23–85 years. The animal owners with an educational qualification of high school constituted 24.5% of total respondents. The percentages of illiterate, primary, middle, intermediate, graduate animal owners were 13.5, 5.5, 16.5, 19.5, and 20.5%, respectively. As per the data on occupation of animal owners, maximum (89%) belonged to agriculture followed by dairy (8%), service (2.5%) and

business (0.5%). Dairy sector is growing at faster rate in recent decade and is developing as rural industry in remote area. The average herd size in the study area was found to be 2.89 with 1.15 cattle and 1.75 buffalo population per households. Majority of households (72%) belonged to joint family category in the survey area. Maximum (35%) farmers were small (landholding up to 0.93–1.69 ha) and minimum (05.5%) were landless farmers followed by marginal (landholding 0.08–0.84 ha) farmers (33.5%), medium (landholding 1.77–2.53 ha) farmers (15.5%) and large (landholding above 2.53 ha) farmers (10.5%), respectively (Table 1). Similar studies were also conducted by Rathore *et al.* (2010), Rajeev *et al.* (2015) and Ravinder *et al.* (2017) and reported that farmer's education and herd size had significant effect on production.

About 95.58% crossbred cows were covered by artificial insemination and 4.42% by both artificial insemination and natural services (Table 3). The average number of services per cow was 1.75 per animal. It was also observed that the farmers preferred HF cross animals in the area. In buffaloes it was 31.4% artificial insemination, 19.77% natural service and 48.83% both type (AI/natural services) as per availability at their doorsteps. However, both types of services were mostly practiced in repeat breeding animals.

Regarding knowledge about sex semen, only 3% had the knowledge while 97 per cent were not having any

Table 1. Socio-economic profile of dairy farmers (N=200)

| Independent variable       | Categories of respondent | Cattle owner |            |
|----------------------------|--------------------------|--------------|------------|
|                            |                          | Frequency    | Percentage |
| Age (in years)             | Below 40                 | 39           | 19.5       |
|                            | Between 40–60            | 119          | 59.5       |
|                            | Above 60                 | 42           | 21.0       |
|                            | Min 23/ Max 85           | 200          | 100.0      |
|                            | Mean                     | 51.31        |            |
| Caste                      | SC                       | 3            | 1.5        |
|                            | OBC                      | 167          | 83.5       |
|                            | General                  | 30           | 15.0       |
| Occupation of owner        | Service                  | 5            | 2.5        |
|                            | Business                 | 1            | 0.5        |
|                            | Agriculture              | 178          | 89.0       |
|                            | Dairying                 | 16           | 8.0        |
| Education                  | Illiterate               | 27           | 13.5       |
|                            | Primary                  | 11           | 5.5        |
|                            | Middle                   | 33           | 16.5       |
|                            | High Secondary           | 49           | 24.5       |
|                            | Intermediate/10+2        | 39           | 19.5       |
|                            | Graduate/above           | 41           | 20.5       |
|                            |                          |              |            |
| Family size                | Small (upto 5)           | 75           | 37.5       |
|                            | Medium (6–10)            | 105          | 52.5       |
|                            | Large (Above 10)         | 20           | 10.0       |
| Family type                | Nuclear                  | 56           | 28.0       |
|                            | Joint                    | 144          | 72.0       |
| Land holding (in hectares) | Landless                 | 11           | 05.5       |
|                            | Marginal (0.08–0.84)     | 67           | 33.5       |
|                            | Small (0.93–1.69)        | 70           | 35.0       |
|                            | Medium (1.77–2.53)       | 31           | 15.5       |
|                            | Large (above 2.53)       | 21           | 10.5       |

Table 2. Average herd size at farmer's household

| Category of animals | No. of animals | Average/households |
|---------------------|----------------|--------------------|
| Cow                 | 229            | 1.145              |
| Buffalo             | 350            | 1.75               |
| Total               | 579            | 2.89               |

Table 3. Breeding management at farmer's household

| Category of animals      | Natural Service (%) | AI (%)      | Both (%)   | No. of service (Average) |
|--------------------------|---------------------|-------------|------------|--------------------------|
| Cow ( <i>desi</i> ) (18) | 03 (16.67)          | 15 (83.33)  | –          | 1.58                     |
| Cow (CB) (113)           | –                   | 108 (95.58) | 5 (04.42)  | 1.75                     |
| Buffalo (172)            | 34 (19.77)          | 54 (31.40)  | 84 (48.83) | 1.53                     |

knowledge about the sexed semen for production of female calf. Now-a-day, farmers have keen interest in adoption of sexed semen technology because male calf disposal is a big issue in villages. Due to high use of multimedia and information technology by young generation, new technology adoption and awareness rate are increasing day by day in dairy sector.

The overall average milk production per households was 9.52 kg and consumption was around 6.32 kg per households; rest of the milk (3.16 kg) was sold to local milkman/milk collecting societies etc. The milk sale prices varied from village to village in the range of ₹ 22–30 for cow milk and ₹ 32–52 for buffalo milk in the study area.

The data on feeding dairy animals reveals that the crossbred cattle were fed green fodder (12.15 kg), dry fodder (8.1 kg), concentrates (2.32 kg) and mineral mixture (19.74 g) per day per dairy animals. On the other hand, in buffaloes the feed composition was on an average 15.89 kg green fodder, 9.34 kg dry fodder, 2.27 kg concentrate and 18.08 g mineral mixture.

The green fodder crops generally grown and made available to animals were jowar, berseem, sugarcane tops and oats etc. As regards to concentrates, the animals were given readymade feed purchased from market. The fodder cultivation was on an average 0.32 ha jowar, 0.12 ha berseem, 1.15 ha sugarcane tops and 0.15 ha oats for the dairy animals. During the survey, it was observed that there was a big scarcity of green fodder for dairy animals, especially in summer season. Rathore *et al.* (2010) also observed same findings in cattle. There were so many factors affecting fodder production like small land holding, wild animals, lack of awareness, lack of quality seed of fodder etc.

*Production of cattle milk according to different categories of farmers:* The production performance of animals according to different categories of farmers (Table 4) showed that 87 out of 200 farmers were rearing cattle and overall average milk yield of cattle was 11.10±2.6 kg per households. It was further observed that commercial farmers obtained higher milk yield per cow (14.34±2.1 kg) than the non-commercial crop farmers (12.61±1.5 kg).

Table 4. Production performance of cattle according to farmer's categories

| Category                             | No. of cattle farmers | Percentage | Milk yield (kg)/day |
|--------------------------------------|-----------------------|------------|---------------------|
| Overall mean                         | 87                    | 100        | 11.10±2.6           |
| <i>Block wise</i>                    |                       |            |                     |
| Kila prakshitgarh                    | 19                    | 21.84      | 9.29±2.8            |
| Jani                                 | 24                    | 27.59      | 8.87±3.0            |
| Plilana                              | 18                    | 20.68      | 13.20±2.7           |
| Baraut                               | 26                    | 29.88      | 13.05±2.9           |
| <i>Occupation of owners</i>          |                       |            |                     |
| Service                              | 1                     | 01.14      | 6.35±6.7            |
| Business                             | 0                     | —          | —                   |
| Agriculture (crop)                   | 74                    | 85.05      | 12.61±1.5           |
| Dairying                             | 12                    | 13.79      | 14.34±2.1           |
| <i>Education</i>                     |                       |            |                     |
| Illiterate                           | 14                    | 16.09      | 9.76±2.9            |
| Up to Primary                        | 1                     | 01.14      | 9.57±7.3            |
| Middle                               | 18                    | 20.69      | 9.37±3.1            |
| High School                          | 25                    | 28.74      | 12.18±2.7           |
| Intermediate                         | 14                    | 16.09      | 13.11±3.1           |
| Graduate or above                    | 15                    | 17.24      | 12.62±2.6           |
| <i>Family Type</i>                   |                       |            |                     |
| Nuclear                              | 24                    | 27.58      | 10.43±2.6           |
| Joint                                | 63                    | 72.41      | 11.76±2.8           |
| <i>Landholding size (in hectare)</i> |                       |            |                     |
| Landless                             | 3                     | 03.44      | 18.22±4.6           |
| Marginal (0.08–0.84)                 | 32                    | 36.78      | 6.62±2.5            |
| Small (0.93–1.69)                    | 26                    | 29.89      | 7.90±2.7            |
| Medium (1.77–2.53)                   | 14                    | 16.09      | 8.72±3.1            |
| Large (above 2.53)                   | 12                    | 13.80      | 14.04±3.0           |
| <i>Parity order wise</i>             |                       |            |                     |
| I                                    | 10                    | 11.49      | 9.61±3.4            |
| II                                   | 28                    | 32.18      | 10.21±3.0           |
| III                                  | 35                    | 40.22      | 9.70±2.9            |
| IV                                   | 11                    | 12.64      | 14.28±2.7           |
| V                                    | 3                     | 03.44      | 11.71±4.4           |

Owners having intermediate level of education while graduate and above, high school, middle pass, recorded highest milk production (13.11±3.1 kg), primary and illiterate were having average milk yield of their cows as 12.62±2.6, 12.18±2.7, 9.37±3.1, 9.57±7.3 and 9.76±2.9 kg, respectively. This is because the educated owners had more awareness and practiced dairy in scientific manners for getting the higher productivity.

The joint family household had higher cattle milk yield (11.76±2.8 kg) than nuclear family (10.43±2.6 kg). This may be because joint family farmers provided higher work force and paid extra care to their animals. The landless farmers had maximum cattle milk yield (18.22±4.6 kg) (Table 4) followed by large (landholding above 2.53 ha) farmers (14.04±3.0 kg), medium (landholding 1.77–2.53 ha) farmers (8.72±3.1 kg), small (landholding 0.93–1.69 ha) farmers (7.90±2.7 kg) and marginal (landholding 0.08–0.84 ha) farmers (6.62±2.5 kg), respectively. Ravinder *et al.* (2017) and Das *et al.* (2017) observed low production under the field conditions. High production under the landless households may be due to giving more attention towards dairy animals. Whereas, more milk yield under the large farmer category may be due to use of high input for their dairy animals.

The data on parity order wise of cattle revealed highest milk production (14.28±2.7 kg) in IV lactation of cows and minimum (9.61±3.4 kg) in first lactation of cows followed by 11.71±4.4 kg, 10.21±3.0 kg and 9.70±2.9 kg in V, II and III lactations of cows. Surprisingly data showed that most of the households rearing the cows usually sell their cows after fifth parity.

The analysis of data on animal health related problems revealed that diseases like mastitis, FMD and diarrhoea among the cows were 6.12, 4.4 and 5.24%, respectively. Whereas, these were 7.43, 6.00 and 4.57% in buffaloes. Data on reproductive disorders in Table 5 indicate highest (14.41%) incidence of repeat breeding in cows followed by anoestrus, metritis, retention of placenta, dystocia and utero-vaginal prolapse as 4.80, 2.62, 2.62, 4.74 and 0.43%,

Table 5. Source of information used by dairy farmers (N=200)

| Source of information | Response of the households |      |               |      |           |      | Total score | Mean score | Ranks |
|-----------------------|----------------------------|------|---------------|------|-----------|------|-------------|------------|-------|
|                       | Mostly (2)                 |      | Sometimes (1) |      | Never (0) |      |             |            |       |
|                       | Frequency                  | %    | Frequency     | %    | Frequency | %    |             |            |       |
| TV                    | 105                        | 52.5 | 47            | 23.5 | 48        | 24.0 | 257         | 1.29       | III   |
| Radio                 | 01                         | 0.5  | 01            | 0.5  | 198       | 99.0 | 03          | 0.02       | X     |
| Newspaper             | 125                        | 62.5 | 39            | 19.5 | 36        | 18.0 | 289         | 1.45       | II    |
| Facebook              | 17                         | 08.5 | 05            | 02.5 | 78        | 39.0 | 39          | 0.20       | VII   |
| Whatsapp              | 18                         | 9.0  | 03            | 1.5  | 179       | 89.5 | 39          | 0.20       | VII   |
| You tube              | 15                         | 7.5  | 02            | 1.0  | 183       | 91.5 | 32          | 0.16       | IX    |
| Mobile                | 171                        | 85.5 | 11            | 5.5  | 18        | 9.0  | 353         | 1.77       | I     |
| KVK                   | 12                         | 6.0  | 28            | 14.0 | 160       | 80.0 | 52          | 0.26       | VI    |
| Farmers fairs         | 30                         | 15.0 | 62            | 31.0 | 108       | 54.0 | 122         | 0.61       | IV    |
| Government agencies   | 17                         | 8.5  | 65            | 32.5 | 118       | 59.0 | 99          | 0.50       | V     |
| NGO                   | 9                          | 4.5  | 17            | 8.5  | 174       | 87.0 | 35          | 0.18       | VIII  |

respectively. On the other hand, highest (15.71%) incidence was of anoestrus in buffaloes followed by repeat breeding (13.71%), utero-vaginal prolapse (4.85%), metritis (2.85%), retention of placenta (2%) and dystocia (2%), respectively.

Table 5 revealed that dairy farmers had access to the modern dairy farming technologies by using 11 sources of information. Out of these, three were used most of time namely, mobile, newspaper and television and ranked them as I, II and III followed by farmer fairs, Government agencies, KVK, social media and NGO respectively. Similar findings were also reported by Rajeev *et al.* (2015).

The study on socio-economic parameters revealed that the average age of dairy farmers was 51.31 years with range between 23–85 years. Main (89%) occupation of household was agriculture (crop farming) followed by dairy (8%), service (2.5%) and business (0.5%). Maximum owners (24.5%) of animals were having educational qualification of high school. The average herd size was 2.89 dairy animals per household comprising 1.15 cattle and 1.75 buffalo per households in study area. A total of 95.58% crossbred cows were covered by artificial insemination and 4.42 per cent were through both AI/natural services. The average number of services per cow were 1.75 per animal. The crossbred cattle were fed green fodder (12.15 kg), dry fodder (8.1 kg), concentrates (2.32 kg) and mineral mixture (19.74 g) per day per dairy animals. Parity wise productivity of cattle was found highest (14.28±2.7 kg) in 4<sup>th</sup> lactation and lowest (9.61±3.4 kg) in 1<sup>st</sup> lactation of cows followed by 5<sup>th</sup> (11.71±4.4 kg), 2<sup>nd</sup> (10.21±3.0 kg) and 3<sup>rd</sup> (9.70±2.9 kg) lactation of cows. Whereas, the overall average milk production per household was 14.33 kg per day out of which

7.36 kg was used for self-consumption. The rest of milk (12.24 kg) was sold to local milkman. The incidence of reproductive problems among the dairy cows was found highest in case of repeat breeding (14.41%) followed by anoestrus, metritis, retention of placenta, dystocia and utero vaginal prolapse as 4.8, 2.62, 2.62, 1.74 and 0.43%, respectively. This baseline study will be helpful in improvement of breeding, feeding and healthcare management practices and understand the production and consumption pattern of milk under the Doab area of Uttar Pradesh.

#### REFERENCES

- Anonymous. 2012. 19<sup>th</sup> Livestock Census. 2012. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture and Farmers Welfare, Govt. of India.
- Das A K, Kumar R, Rathee S K, Prakash B, Kumar A, Dubey P P, Bhagat R L, Singh C B, Singh U, Arun Kumar, Tyagi S and Bhasin V. 2017. Genetic improvement of cattle through field progeny testing programme: An evaluation of achievement. *Indian Journal of Animal Sciences* **87**(12): 1445–1451.
- Kumar R, Das A K, Raja T V, Rathee S K, Dubey P P and Prakash B. 2017. Performance of crossbred cattle (HF × Sahiwal) under tropical farming conditions of Punjab. *Indian Journal of Animal Sciences* **87**(11): 1402–1405.
- Rajeev, Kumar R, Singh R, Kumar N and Kumar P. 2016. Level of cattle rearing practices followed by farmers of Indo-Gangetic plain zone. *Indian Journal of Animal Sciences* **86**(6): 715–719.
- Rathore R S, Singh R, Kachwaha R N and Kumar R. 2010. Exiting management practices followed by the cattle keepers in Churu district of Rajasthan. *Indian Journal of Animal Science* **80**(8): 798–805.