Indian J Dairy Sci 76(4): 376-382
https://doi.org/10.33785/IJDS.2023.v76i04.010

RESEARCH ARTICLE

Socio-economic profile and constraints of farmers rearing Hariana cattle

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Received: 15 May 2023 / Accepted: 15 June 2023 / Published online: 18 August 2023

Abstract: The study was conducted in Hisar, Bhiwani, Rohtak and Jhajjar districts of Haryana state in India to assess the socioeconomic profile, technology adoption and constraints of the farmers rearing Hariana cattle in its breeding tract. A total of 240 respondents (60 respondents from each district) were purposively selected and interviewed individually. 84.58 % of the farmers belong to joint family. Occupation of majority of the respondents was agriculture (53.33 %) along with dairying. Most of the farmers were small (27.50 %), marginal (28.34 %) and landless (29.58 %) with an average land holding of 2.6 acres. 50 % of them belong to medium (40000-150000 lakhs) annual family income group. The average herd size and lactation yield of Hariana cattle in study area was 1.56 and 1014.21 L respectively. Majority of the farmers have adopted all the technologies only few of them have not adopted due to lack of knowledge. The major constraints in Hariana cattle rearing is low productivity compared to Murrah buffalo and CB cattle. The other prevailing constraints of farmers in the study areas were aggressive behaviour of Hariana cattle, sale of male calves, reduction in grazing land, lack of timely veterinary and AI services, dilution of breed arise from indiscriminate breeding and scarcity of feed and fodder.

Keywords: Constraints, Dairying, Feeding, Hariana cattle, Socio-economic, Technology

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Introduction

The milk produced from cattle and buffalo is the largest agricultural commodity and plays a major role in Indian economy (Panchbhai et al. 2017). In order to achieve progress, dairy farmers should be modernized in knowledge, adoption and their personal, social and economic characteristics should be improved. Among the livestock farming systems, dairy farming plays significant role in sustaining the rural livelihoods (Shinde, 2011) by reducing the longstanding problems of unemployment and underemployment (Rachna et al. 2017). Adoption of technical recommendations at the farm level is dependent on the social, cultural, economic (Gopi et al. 2017) and environmental conditions facing by the farmer who own the animals (Solano et al. 2000; Ayenew et al. 2011).

India is having a wide reservoir of genetic diversity and possesses some of the best breeds of cattle and buffaloes in the world. Indigenous cattle breed have evolved over generations to adapt to local agro-climatic and socioeconomic need of people (Singh et al. 2021). Indigenous cattle, are robust, resilient and are suited to the climate and environment of their respective breeding tracts, and the ability to thrive under extreme climatic stress and sub-optimal nutrition (Singh et al. 2019). Each breed is known for its own characteristic features and utility, whether specific for milk production, draught power or both (Kumar et al. 2019).

Haryana has the pride of being the place of origin for famous breeds of Hariana Cows and Murrah buffaloes (Raj and Gupta, 2015). Haryana or Hariana cattle's home tract is in Haryana state but the breed is distributed in Uttar Pradesh, Bihar and parts of Rajasthan. Cows are good milkers and bullocks are useful for ploughing and transport. The milk yield of from 809 to 1,731 kg and bullocks are good for agricultural operations (Mishra et al. 1980; Upadhyay and Madan 1985; Kumar et al. 2019). The indigenous cattle rearing is declining due to low productivity, lesser income and reduced usage of draught power by the farmers (Raj and Gupta, 2015). The total estimated number of Hariana cattle during 2013 was 16,39,181 (Report, 2013). The quinquennial livestock census (2007, 2012 and 2019) have revealed a declining trend of cattle population in Haryana state (20th Livestock census, 2019). Therefore it is appropriate to assess the relevance of rearing

native dairy animals in rural livelihood and to understand opportunities or challenges faced by smallholder dairy farmers. However, information on the type and level of socio-economic factors affecting dairy production systems is limited (Ayenew et al. 2011) especially for Hariana cattle. Therefore, this study was conducted with an objective to assess the socio-economic characteristics of the dairy production systems and to suggest appropriate intervention for Hariana cattle rearing systems in its breeding tract.

Materials and Methods

Study area and animals

The native breeding tract of Hariana cattle lies between 28°30' and 300 North latitude and 75° 45' and 76° 80' East longitude. The native breeding tract of Hariana cattle encompasses large part of Rohtak, Hisar and Gurgaon districts of Hariana state. Purebred Hariana cattle were abundant in Jhajjar, Beri and Jahajgarh locations of Rohtak district and the region was a leading trading centre particularly for Hariana bullocks. The home tract of this breed is the areas covered by the districts of Rohtak, Hisar, Gurgaon and part of Karnal in the Haryana State, and the Union Territory of Delhi.

Multistage stratified sampling procedure was used to select the districts, villages and respondents. Four districts (Rohtak, Jhajjar, Hisar and Bhiwani) were selected purposively and three tehsils were selected randomly from each identified district. From each selected tehsil, two villages was selected randomly. A total of 24 villages were selected for undertaking the study in the native hariana cattle breeding tract.

Distribution/classification of the respondents

A structured questionare was prepared and was divided into two sections. The first section was on socio economic condition of the Hariana cattle rearing farmers including age, gender, family size and education. Household and cattle rearing related characteristics included family labor availability, total acres of land holding, occupation, cows in production, daily milk output, family income and employment generation.

Section two was focused on the constraints of Hariana cattle rearing and were ranked based on the perception of the farmers. After the selection of the villages, a preliminary survey was conducted in the selected villages to know the total number of farmers practicing dairy farming.

Among these selected villages, 10 dairy farmers were selected by proportionate random sampling from each village by considering the herd size of the animals. Only those farmers were selected who were owning atleast one Hariana cattle. Thus, the total respondents of the study was 240 dairy farmers including 141 males and 99 female respondents (for management practices, performance and economic viability). All farmers agreed to answer for the questionnaire and gave their consent prior to data collection during October and December 2017. Interview schedule was conducted at the convenience of dairy farmer either at his or her home or at farmsted.

Statistical analysis

The data collected from the dairy farmers were scored, tabulated and analyzed using descriptive statistics. The data collected was analysed using simple statistical tools such as averages, frequencies and percentage.

Results and Discussion

Socio economic profile of farmers

The results obtained indicated that majority of respondents were in middle age category, i.e. 35-50 years, followed by young age category and rest belonged to old age category (Table 1). It was observed that minimum age was 20 years and highest age was 75 years. Similarly, Gautam et al. (2007) observed that 73.30 % of dairy farmers were middle aged and 15 % and 11.70 % were in each old and young age group with a mean age of about 43 years among the dairy farmers in Haryana. The dairy farming activities are held largely by middle age group.

It is evident from the Table 1 that, majority (58.75 %) of the respondents are male and rest (41.25) were female. Similarly, Gabalebatse et al. (2013) and Singh (2012) also reported that majority of the respondents were male in the study area.

The study indicated that majority (84.58%) of the respondents belonged to joint family (>4 members) followed by, 15.42 % that belonged to nuclear (< or = 4 members) (Table 1). This might be due to the fact that, most of the respondents belonged to joint family in the study area reflecting the existence of joint family socio-cultural system in the rural areas of Haryana state. The results of the study are in agreement with Gour et al. (2015). They reported that majority of the respondents belonged to medium family size.

The district wise education level of farmers has been depicted in Table 1 and it is clear from the that 38.33 % of the respondents were educated up to secondary and senior secondary level, 20.42 % who had upper primary level of education, 16.25 % illiterate, 15.00 % up to primary school and 10.00 % graduation and above, respectively Muriithi et al. (2014) reported that most of dairy farmers (60.4 %) had above secondary education and further 2.3 % had gone up to university level education. Whereas, Gopi et al. (2017) found that nearly half (45.00 %) of the respondents were illiterate followed by high school education (19.17 %), primary school and middle school education (each 13.33 %), can read and write (5.00 %) and can read only (2.50 %). A negligible 1.67 % of the respondents had collegiate education in study area of Tamil Nadu.

Whereas Rachna et al. (2017) have reported that majority of the dairy farmers had high level of education in Hisar region of Haryana.

It could be observed from the table 1 that a majority (53.33%) of the respondents had agriculture and dairy as their primary occupation followed by agricultural labour (27.08%). The respondents raised cattle as a secondary source of income in

Table 1: Socio-economic characteristics of farmers rearing Hariana cattle

Parameters		Districts				Total
		Bhiwani (n=60)	Hisar (n=60)	Rohtak (n=60)	Jhajhar (n=60)	(n=240)
Age (%)	Young (<35)	43.33 (26)	36. 67 (22)	35.00 (21)	25.00 (15)	35.00 (84)
	Middle (35-50)	41.67 (25)	48.33 (29)	51.67 (31)	55.00 (33)	49.17 (118)
	Old (>50)	15 (9)	15 (9)	13.33 (8)	20.00 (12)	15.83 (38)
Gender (%)	Male	65.00 (39)	68.33 (41)	48.33 (29)	53.33 (32)	58.75 (141)
	Female	35.00 (21)	31.67 (19)	49.67 (31)	46.67 (28)	41.25 (99)
Family size (%)	< 4 and = 4	11.66 (7)	20.00 (12)	15.00 (9)	15.00 (9)	15.42 37
	>4	53	80.00 (48)	85.00 (51)	85.00 (51)	84.58 (203)
Education (%)	Illiterate	25.00 (15)	18.33 (11)	10.00 (6)	11.67 (7)	16.25 (39)
	Primary	13.33 (8)	26.67 (16)	15.00 (9)	5.00 (3)	15.00 (36)
	Upper Primary	20.00 (12)	25.00 (15)	26.67 (16)	10.00 (6)	20.42 (49)
	Secondary and Senior Secondary	41.67 (25)	16.67 (10)	35.00 (21)	60.00 (36)	38.33 (92)
	Graduation and Above	0 (0)	13.33 (8)	13.33 (8)	13.33 (8)	10.00 (24)
Occupation (%)	Agricultural (Agriculture + Dairy)	48.33 (29)	56.67 (34)	55.00 (33)	53.33 (32)	53.33 (128)
	Labour	3.33 (2)	13.33 (8)	8.33 (5)	6.67 (4)	7.92 (19)
	Agricultural + Labour	41.67 (25)	16.67 (10)	25.00 (15)	25.00 (15)	27.08 (65)
	Job	6.67 (4)	13.33 (8)	11.67 (7)	15.00 (9)	11.67 (28)
Farm characteristics						
Land (%)	Landless	31.66 (19)	35.00 (21)	23.33 (14)	28.33 (17)	29.58 (71)
	Marginal	18.33 (11)	18.33 (11)	33.33 (20)	43.33 (26)	28.34 (68)
	Small	21.67 (13)	35.00 (21)	35.00 (21)	18.34 (11)	27.50 (66)
	Medium	20.00 (12)	11.66 (7)	6.67 (4)	10.00 (6)	12.08 (29)
	Large	8.33 (5)	0 (0)	1.67 (1)	0 (0)	2.50 (6)
Average land holding (acres)		3.58	2.43	2.42	2.0	2.61
Annual family income (Rs.)	< 40000	28.33 (17)	35.00 (21)	25.00 (15)	38.33 (23)	31.67 (76)
	40000-150000	48.34 (29)	45.00 (27)	56.67 (34)	50.00 (30)	50.00 (120)
	>150000	23.33 (14)	20.00 (12)	18.33 (11)	11.67 (7)	18.33 (44)
Herd size (heads)		1.65	1.7	1.35	1.55	1.56
Average Lactation Yield (L)		1043.83	1141.83	999.5	871.67	1014.21

addition to using the milk and milk products for their own consumption. Bashir and Kumar (2013) and Solanki et al. (2011) also found that most of the respondents practiced crop farming as a major occupation. Sah (2005) reported that dairying was the main occupation among majority of the respondents.

In the present study, a considerable size (29.58%) of the respondent's belonged to landless category, followed by 28.34, 27.50, 12.08 and 2.50 % of respondents belonged to marginal, small, medium and large category respectively (Table 1). Our findings are in agreement with the findings of Verma et al. (2016) who also reported that majority of respondents were small and marginal. In contrary to our study, Khode et al. (2009) also reported that most of the respondents belonged to large farmers category. Also, Muriithi et al. (2014) concluded that majority of respondents had less than 2 acres of land and 5.8 % of respondents had more than five acres of land these are finding contraindicates to above findings. Also, Panchbhai et al. (2017) reported that 35.00 % of respondents' belonged to small farmer category, 22.50 % belonged to the category of marginal and 19.50 % to the category of medium farmers. Only 19.00 % farmers belonged to large category and 4.00 % farmers were landless, respectively.

Income is a crucial variable, which influences the farmer's investment in farming activities. The income obtained from various sources viz., crop, livestock and others as reported by the respondents were considered in order to calculate the gross annual income per family. The Table 1 shows that the annual income of 50.00 % of the respondent was Rs. 40000 to Rs. 150000, followed by 31.67 % of the respondent had less than Rs 40000 annual income and 18.33 % respondent had more than Rs. 150000 annual income. It might be due to the fact that farms and livestock give more annual income for dairy farmers as compare to other sources like labor, job etc. Similar to findings of our study, Panchbhai et al. (2017) also reported that the majority of the respondents (46.50 %) were in medium income group followed by low income (27.00 %) and high income (26.50 %), respectively.

Employment generation and technology adoption

Since milk production is a continuous process, it has greater ability of employment generation as compared to crop sector. Also, dairy farming is considered to be a tool of women empowerment since many dairy operations are performed by women. Table 2 indicates employment potential per household in dairy farming. The results indicated that in terms of hours, women are the highest contributors of labour in dairy farming operations in Haryana but in terms of man-hours, adult males are highest contributors. On an average, each households spent nearly two man-hours in dairy farming operations.

The majority of farmers (90 %) fed concentrates to Hariana cattle (Table 3). Jarial, (2006) also reported that majority of the respondents fed concentrate feed. In respect to calf management practices, all the farmers fed colostrum to the calves. Mahla et al. (2015) and also reported that majority of the respondents fed colostrum to calf after the placenta was shed. The present study revealed that most of the respondents did not have complete knowledge about good dairy farming practices including colustrum feeding to young ones.

The practices of dehorning and deworming were adopted by 24.16 % and 60 % of the farmers, respectively. Similarly to our findings, Yogendra (2010) reported that 80 % of the farmers followed deworming schedule in Hariana cattle. Some of the respondents used indigenous methods to prevent ecto-parasites. In contrary to our findings, Mahla et al. (2015) found that none of the respondents had resorted to dehorning in indigenous cattle.

Table 2. Employment generation per household from Dairy Farming in Haryana

Labour Source	Time (in hours)/ day	Time (in man-hours)/ day
Adult male	1.02	1.02
Adult female	1.07	0.80
Children	0.33	0.17
Total	2.42	1.99

Table 3. Technologies adopted by farmers rearing Hariana cattle

S. No.	Technologies	Users (%)	Non users
1	Concentrate feeding	216 (90)	24
2	Colostrum feeding to calf	240 (100)	0
3	Dehorning	58 (24.16)	182
4	Deworming	144 (60)	96
5	Vaccination	235 (97.91)	05
6	Artificial insemination	72 (30)	168
7	Mineral mixture feeding	24 (10)	216
8	Clean milk production	48 (20)	192

Table 4: Constraints on rearing of Hariana cattle faced by respondents

S. No.	Constraints of Hariana cattle rearing	N	Per cent	Rank
1	Farmers inclination towards rearing of Murrah buffalo and CB cattle owing to their better profitability	61	76.25	I
2	Specific behavioural problems such as aggressive behaviour, Allowing milking to an individual family member, Milk holding habit that results in incomplete milking.	52	65	II
3	Sale of male calves in particular and dry animals in general because of governmental ban on slaughter	50	62.5	III
4	Reduction in grazing land/ Panchayat Charagah	47	58.75	IV
5	Lack of timely veterinary and AI services	43	53.75	V
6	Dilution of breed arise from indiscriminate breeding	41	51.25	VI
7	Scarcity of fodder during summer	38	47.5	VII
8	Diversification of Agriculture	36	45	VIII
9	Non- availability of pedigree bull	35	43.75	IX
10	Short lactation length	31	38.75	X
11	Poor market value of bullocks	24	30	XI

Nearly 97.91 % (235) farmers were following the vaccination against contagious diseases which is provide by state government whereas 5 farmers did not followed vaccination schedule (Table 3.). Similar to our study, Yogendra (2010) found that most of the farmers were using the veterinary health care services for the animals in Haryana state. In contrary to our findings Kumar et al. (2014) found that most of the respondents were not able to access the animal health care services.

Majority (70 %) of the respondents preferred to natural services and remaining (30 %) adopted artificial insemination (AI) for breeding purpose of their cattle. The findings of study were in agreement with Sheikh and Parmar (2015), Kumar et al. (2014) and Yadav et al. (2009). The results of the study showed that, respondents of the study area did not prefer the AI over natural service to Hariana cattle because of their furious nature, AI cost is high, and hospitals are far away from home. In the case of natural mating, majority of cattle are being mated indiscriminately with any approachable bull, while some of the respondents took care of their cows by mating with best selected bull. In the case of heat detection practices, most of the respondents used all the indigenous techniques of heat detection viz. bellowing, restlessness, frequent urination, allowing other animal to mount and vaginal discharges. Similarly, Jarial (2006) also reported that majority of the respondent identified heat by indigenous methods. Majority (90 %) of the respondents did not add any mineral mixture in animals diet due to high cost and less awareness about it. The lack of mineral mixture and common salt in the diet lead to various reproductive disorders like repeat breeding and anestrous.

In the case of clean milk production, only 20 % of the respondents followed washing of hands before milking because majority of the farmers were not aware about the drawbacks caused by the unhygienic milk handling which clearly indicated the lack of knowledge about the clean milk production practices at field level. Majority of the farmers were not maintaining cleanliness in their house and milking premises. All people follow washing of udder with normal water before milking. Further, most of the respondents were not aware of removal of hair from the udder and the practice of discarding the first two streams of milk from each teat. Further, after milking large majority of the respondents were not following the practice of not allowing the animal to sit soon after milking at least for twenty minutes which is very helpful in prevention of mastitis. Properly cleaned milk utensils- an important practice in hygienic milking practices is adopted by very less percentage of farmers. Instead of using separate utensils for milking, most of them were habitual in using of utensils which were commonly used in their kitchen and most of the time they used only normal water for cleaning of milking utensils.

Constraints of Hariana cattle rearing

Livestock production system particularly the rearing of Hariana cattle is facing various challenges/limitations in the surveyed

region. Few of them were of social or personal origin and their elimination to some extent was possible, while others were related to climatic and geographical factors which were largely beyond the control of the farmers. Response of several respondents have revealed that the major constraints faced by farmers during rearing of Hariana cattle as shown in Table 4. which includes farmers inclination towards rearing of Murrah buffalo and CB cattle owing to their better profitability (76.25 %), specific behavioral problems such as aggressive behavior, allowing milking to an individual family member, milk holding habit that results in incomplete milking (65 %), problem in sale of male calves in particular and dry animals in general because of governmental ban on slaughter (62.50 %), reduction in grazing land/ Panchayat Charagah (58.75 %), lack of timely veterinary and AI services (53.75 %), dilution of breed arise from indiscriminate breeding (51.25 %), scarcity of fodder during summer (47.50 %), diversification of agriculture (45 %), non- availability of pedigree bull (43.75 %), short lactation length (38.75 %) and poor market value of bullocks (30 %). Some of the constraints as discussed above were also reported earlier by Yogendra (2010). Constraints faced by farmers might be identical to the location and species of livestock. However, some of the problems are constant in our country and the same are referred as the common problems of livestock management and practices (Jangid and Rohilla, 2004).

Conclusions

It can be concluded that the farmers tend to specialize in dairy production along with agriculture which forms important source of family income. The middle aged farmers were more among the Haryana cattle rearing farmers with more number of secondary and senior secondary education. The technology adaptation can be improved by the access to services such as the transfer of technical knowledge, deworming, dehorning, mineral mixture feeding, artificial insemination, knowledge of clean milk production and other veterinary services. The productivity and the non-feasibility of rearing Hariana cattle are its aggressive behaviour, problems of rearing male calves, reduction in grazing land, scarcity of fodder, short lactation length, poor market value of bullocks are likely to hamper the rearing of this breed and need to be addressed by specific policy schemes. Therefore, this work can be helpful to design any programmes or schemes meant for improvement of Hariana cattle breed in its breeding tract.

Acknowledgement

The authors are thankful to Director, ICAR – NDRI, Karnal, Haryana for providing necessary facilities and funding for undertaking this study.

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