The Haryana Veterinarian (March, 2024) **63(SI),** 10-14 ISSN 0033-4359 (P) **Research Article**

COMPARATIVE ANALYSIS OF DAIRY FARMER'S INVOLVED IN VALUE ADDITION OF MILK

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ABSTRACT

Dairy farming holds significant importance in the social and economic well-being of dairy farmers. This research was carried out in the districts of Hisar and Kurukshetra in Haryana, with the random selection of two subdivisions from each district. Following that, one block was chosen at random from each subdivision. From every block, three villages were randomly picked. Lastly, 10 respondents owning at least four milch animals were randomly selected from each village. The data was gathered through a pre-designed interview schedule conducted *via* personal interviews. The collected data underwent analysis using basic statistical methods such as frequency, percentage, mean, standard deviation, Z-value, and Chi-square value. The findings reveal that a significant portion (62.5%) of dairy farmers fell into the middle age group, with 55% being female. Additionally, 34% had education up to the higher secondary level, 60% were part of joint families and 66.67% had a medium-sized family. A majority (55%) of dairy farmers had animal husbandry along with agriculture as their primary occupation, with 30% possessing medium-sized land. Furthermore, 64.17% had a small herd size, and over 70% were categorized as medium-level milk producers. Half of them earned a medium level of gross income. The communication profile, including mass media exposure and extension contact among dairy farmers, was at a medium level, approximately 40%.

Keywords: Dairy farming, Gross income, Occupation, Mass media exposure, Extension contact

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India holds the world's most abundant animal wealth, totaling approximately 209.9 million tonnes, and the per-capita availability of 427 grams per day in 2020-21 exceeds the recommended level. This abundance positions India to harness emerging global milk marketing opportunities, as noted in the Annual Report of the Government of India for 2021-22. Despite this potential, the livestock sector's productivity remains below its optimal level. Nevertheless, Haryana stands out on the national livestock map, achieving prominence despite being one of the smallest states in India, occupying only 1.3% of the total geographical area. Haryana produced about 11.72 million tonnes of milk in 2019-20 and ranks second in-country with 1142 grams per capita per day milk availability (Economic survey Haryana, 2020-21).

Value addition involves enhancing the value of a product by introducing elements such as form, place, and time utility, thereby augmenting the overall value provided by a product or service (Kuma *et al.*, 2011). The creation of milk value-added products presents a distinct opportunity to mitigate losses, generate additional income, and capitalize on robust local demand while simultaneously extending the shelf life of milk (Kuma, 2012). The socioeconomic and demographic features of dairy farm households are expected to have an impact on participation choice and level in farm level milk value addition. Understanding value addition practice is necessary for adoption in this case, which eventually raises socioeconomic standing. In this context, the current study aimed to conduct a benchmark analysis of the socio-economic status of dairy farmers.

MATERIALS AND METHODS

The investigation took place in randomly selected Hisar and Kurukshetra district of Haryana for owing 13.28 per cent share of total state's population of cattle and buffalo (Anonymous, 2019). A group of 120 dairy farmers were selected as respondents through the rigorous multistage random sampling method. The selection process involved the careful selection of two subdivisions from each district, and one block from each subdivision. From there, three villages were randomly selected, resulting in a total of 12 villages from both districts. In each of these villages, 10 dairy farmers were randomly chosen to participate. The data collected was meticulously organized using a pre-tested interview schedule and classified, coded, tabulated, and categorized into various categories. By employing analyses such as frequency, percentage, Z-value, and Chi-square value, a thorough examination was conducted to assess the variations in the socio-economic conditions of dairy farmers.

$$Z\ score = \frac{X - \bar{x}}{\sigma}$$

Where,

X = Standardized random variable

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$\bar{x}$ = Mean of the data

σ = Population standard deviation

$$(Chi\text{-}square\ value)\ \chi^2 = \frac{\Sigma(Oi - Ei)^2}{Ei}$$

Where,

Oi = Observed value

Ei = Expected value

RESULTS AND DISCUSSION

Personal and social characteristics of dairy farmers: A predominant portion (62.5%) falls within the middle age group (33-60 years), as evidenced in Table-1.The young and old age group comprised 24.17 per cent, 13.33 per cent respectively. The middle age group (62.5%) dominated in dairy farming activity in the study area of both districts.

In general, the respondents had an average age of 45.93 years. Z-test analysis reveals that there was no significant difference (Zcal<Ztab) in age of two districts respondents. The middle age is regarded as a productive phase in an individual's life, and furthermore, the younger generation shows lesser interest in choosing dairy farming as their occupation. These results align with the reported by Gautam and Jha (2022) and Ghosh (2021) found almost similar results.

More than half (55%) of respondents were female followed by male (45%). Chi Square-value was found to zero. It reveals that there was equal number of male and female from Kurukshetra and Hisar district (Table 1). This discovery is consistent with the results of Jadav *et al.* (2021). The outcome of this study did not align with the findings of Bhardwaj (2021) and Pareek *et al.* (2022), where they selected that majority of male group were involved in the dairy activities when compared to the female group.

Additionally, the information from Table 1 indicates that 25 percent of respondents from Hisar possessed a higher secondary level of education, while 31.7 percent of respondents from Kurukshetra had reached the higher secondary level. When considering the overall educational status, the study showed that 28.33 percent of respondents had a higher secondary level of education, followed by secondary (20.88%), primary (14.17%), middle (11.67%), graduate and above (10.83%), can read and write (5%), illiterate (5.00%), and can read only (4.17%). The Chi-square value calculated was 6.258, indicating no significant difference (Zcal<Ztab) in the education levels of respondents between Hisar and Kurukshetra districts. This result is consistent with the findings of Pulla *et al.* (2021) and Surushe *et al.* (2022).

Reviewing the data presented in Table 1, it is evident that 61.7 percent of respondents in Hisar were part of joint families, while a significant percentage of 38.3 percent had nuclear families. In Kurukshetra, 58.3 percent of respondents belonged to joint families, with 41.7 percent in nuclear families. In general, 60 percent of respondents were living in joint families. The Chi-square test yielded a value of 0.139, indicating no significant difference between the family types of respondents in Hisar and Kurukshetra. These findings are consistent with the results reported by Saravanan *et al.* (2021a). Joint families remain prevalent due to their convenience in managing family affairs and shared land ownership. However, there has been a noticeable shift towards nuclear families in recent times. This could be attributed to the increasing number of medium-sized families and individuals' migration in search of job opportunities, even in rural areas.

It was identified that a significant proportion (68.3%) of respondents in Hisar belonged to medium-sized families, with 26.7 per cent in small-sized families and 5% in large families. In Kurukshetra, 65 per cent of respondents were from medium-sized families, with 20% in small-sized families and 15 per cent in large families. Overall, the majority (66.67%) of respondents belonged to medium-sized families, with an average family size of 9.96, ranging from 3 to 30 members. The Z-test value of 1.40 revealed no significant difference between respondents in Hisar and Kurukshetra concerning family size (Table 1). Similar findings were reported by Tetarwal *et al.* (2022).

Reviewing Table 1, it is evident that the majority (53.3%) of respondents in Hisar and the majority (56.7%) in Kurukshetra had dairy farming as their primary occupation alongside agriculture. Overall, 55 per cent of dairy farmers considered dairy farming as their main occupation alongside agriculture, while 16.67 per cent were involved in business alongside dairy. Additionally, 14.17 per cent each had occupations related to services and other fields alongside dairy. The Chi-Square value of 1.79 revealed no significant difference between the occupations of respondents in Hisar and Kurukshetra. These findings align with those of Saravanan *et al.* (2021b) and Sheikh *et al.* (2022). The prevalence of farmers engaging in both dairy and agriculture may be attributed to the traditional practice of combining livestock keeping with agriculture.

Economic and social characteristics of dairy farmers: The respondents' overall landholding was categorized as semi-medium, with an average score of 2.77 hectares. Table 1 data indicates that 35 per cent and 23.3 per cent of respondents in Hisar and Kurukshetra, respectively, held 4 to 10 hectares of land. The majority (29.17%) fell into the medium landholding category, while 12.5 per cent were landless. Additionally, 15 per cent each possessed 2-4 hectares and over 10 hectares of land. Among these, 15.83

Table 1. Distribution of the respondents according to various antecedent characteristics

Sr. No.	Variables	Category	Kurukshetra (N=60)	Hisar (N=60)	Overall (N=120)	Z-value/ Chi Square-value
		Socio- personal profile of dairy farmers				
1.	Age	Young (21-32 years)	15 (25)	14 (23.3)	29 (24.17)	1.086NS
		Middle (33-60 years)	40 (66.7)	35 (58.3)	75 (62.5)	
		Old (61-73 years)	5 (8.3)	11 (18.3)	16 (13.33)	
		Mean ± S.D.	44.45 ± 12.56	47.42 ± 14.34	45.93 ± 13.50	
2.	Gender	Male	27 (45)	27 (45)	54 (45)	.000NS
		Female	33 (55)	33 (55)	66 (55)	
		Mean ± S.D.	1.55 ± 0.50	1.55 ± 0.50	1.55 ± 0.50	
3.	Education	Illiterate	2 (3.3)	4 (6.7)	6 (5)	6.258NS
		Can read only	2 (3.3)	3 (5.0)	5 (4.17)	
		Can read and write	1 (1.7)	5 (8.3)	6 (5)	
		Primary	9 (15)	8 (13.3)	17 (14.17)	
		Middle	5 (8.3)	9 (15)	14 (11.67)	
		Secondary	14 (23.3)	11 (18.3)	25 (20.83)	
		High secondary	19 (31.7)	15 (25.0)	34 (28.33)	
		Graduate and above	8 (13.3)	5 (8.3)	13 (10.83)	
		Mean ± S.D.	4.85 ± 1.75	4.22 ± 1.98	4.53 ± 1.89	
4.	Family type	Joint	35 (58.3)	37 (61.7)	72 (60)	.139NS
		Nuclear	25 (41.7)	23 (38.3)	48 (40)	
		Mean ± SE	1.42 ± 0.50	1.38 ± 0.49	1.4 ± 0.49	
5.	Family size	Small (3-5)	12 (20)	16 (26.7)	28 (23.33)	-1.400NS
		Medium (6-15)	39 (65)	41 (68.3)	80 (66.67)	
		Large (16-30)	9 (15)	3 (5)	12 (10)	
		Mean ± S.D.	10.63 ± 5.04	9.28 ± 3.98	9.96 ± 4.58	
6.	Occupation	Dairy + Agriculture	34 (56.7)	32 (53.3)	66 (55)	1.790NS
		Dairy + Govt. Job	6 (10.0)	11 (18.3)	17 (14.17)	
		Dairy + Private	11 (18.3)	9 (15)	20 (16.67)	
		Dairy + Other	9 (15)	8 (13.3)	17 (14.17)	
		Mean ± S.D.	1.92 ± 1.17	1.88 ± 1.11	1.9 ± 1.13	
		Socio-economic profile of dairy farmers				
7.	Land holding	Landless (0 ha)	11 (18.3)	4 (6.7)	15 (12.5)	12.585*
		Marginal (<1 ha)	8 (13.3)	11 (18.3)	19 (15.83)	
		Small (1-2 ha)	5 (8.3)	10 (16.7)	15 (12.5)	
		Semi medium (2-4 ha)	8 (13.3)	10 (16.7)	18 (15)	
		Medium (4-10 ha)	14 (23.3)	21 (35)	35 (29.17)	
		Large (>10 ha)	14 (23.3)	4 (6.7)	18 (15)	
		Mean ± S.D.	2.80 ± 1.86	2.75 ± 1.45	2.77 ± 1.66	
8.	Herd size	Small (4-10)	37 (61.7)	40 (66.7)	77 (64.17)	-8.114**
		Medium (11-17)	16 (26.7)	15 (25)	31 (25.83)	
		Large (above 17)	7 (11.7)	5 (8.3)	12 (10)	
		Mean ± S.D.	13.70 ± 5.28	6.67 ± 9.60	10.18 ± 8.49	
9.	Milk production (liter/day/animal)	Less (3.75-8-56)	20 (33.3)	11 (18.3)	31 (25.8)	-5.176**
		Medium (8.57-13.38)	38 (63.3)	47 (78.3)	85 (70.8)	
		High (above 13.38)	2 (3.3)	2 (3.3)	4 (3.3)	
		Mean ± S.D.	10.11 ± 1.63	8.70 ± 2.36	9.40 ± 2.14	
10.	Milk sale	Less (0-5.44)	14 (23.3)	10 (16.7)	24 (20)	-9.209**

	(liter/day/animal)	Medium (5.45-10.89)	42 (70)	46 (76.7)	88 (73.3)	
		Large (above 10.89)	4 (6.7)	4 (6.7)	8 (6.7)	
		Mean ± S.D.	8.28 ± 1.94	5.74 ± 2.82	7.01 ± 2.73	
11.	Annual income (in lac)	Low (up to 2.5 lac)	17 (28.3)	19 (31.7)	36 (30)	-1.523NS
		Medium (2.5-5 lac)	29 (48.3)	31 (51.7)	60 (50)	
		High (above 5 lac)	14 (23.3)	10 (16.7)	24 (20)	
		Mean ± S.D.	4.47 ± 4.41	3.49 ± 1.63	4 ± 3.36	
		Communication profile of dairy farmers				
12.	Mass Media exposure	Low (below 7)	24 (40)	26 (43.3)	50 (41.67)	-1.087NS
		Medium (7 to 12)	23 (38.3)	29 (48.3)	52 (43.33)	
		High (Above 12)	13 (21.7)	5 (8.3)	18 (15)	
		Mean ± S.D.	8.17 ± 4.16	7.32 ± 3.73	7.74 ± 3.96	
13.	Extension contact	Low (below 6)	24 (40)	23 (38.3)	47 (39.17)	-.042NS
		Medium (6-11)	23 (38.3)	24 (40)	47 (39.17)	
		High (above 11)	13 (21.7)	13 (21.7)	26 (21.67)	
		Mean ± S.D.	7.65 ± 4.21	7.62 ± 3.91	7.63 ± 4.05	

per cent owned less than 1 hectare. Approximately 12.5 per cent of respondents were small landholders. The Chi Square test value of 12.58 indicated a significant difference in landholding between respondents in Hisar and Kurukshetra, aligning with Sharma *et al.* (2022) but differing from Agrawal and Raju (2021).

The data in Table 1 illustrates significant variation in herd size, averaging 10.18 with a standard deviation of 8.49. In Hisar, 66.7 per cent had 4 to 10 animals, while in Kurukshetra, 61.7 per cent had a similar herd size. Overall, 64.17 per cent of respondents had a small herd size, followed by 25.83 per cent with a medium herd size, and 10 per cent with a large herd size. The Z-test value of -8.114 indicated a highly significant difference in herd size between respondents in Hisar and Kurukshetra, aligning with Mote *et al.* (2022) but contradicting Thakane *et al.* (2022). A limitation of the study was the requirement for a minimum of four milch animals, resulting in a relatively larger herd size compared to similar studies.

According to Table 1, 70.8 per cent of dairy farmers were categorized as medium-level milk producers, with 25.8 per cent and 3.3 per cent falling into low and high-level categories, respectively. Hisar respondents had an average peak yield of 8.70 liters per day per animal, while Kurukshetra respondents had 10.11 liters. The overall average peak milk production was 9.40 liters per day per animal. The Z-test value of -5.176 indicated a highly significant difference in peak milk production between respondents in Hisar and Kurukshetra, aligning with Kaur *et al.* (2022).

Table 1 data revealed that 76.7 per cent of dairy farmers in Hisar were medium-level milk sellers, with 16.7 per cent and 6.7 per cent in low and high-level categories, respectively. In Kurukshetra, 70 per cent were medium-level sellers, with 23.3 per cent and 6.7 per cent in low and high-level categories, respectively. The average peak milk sale was 7.01 liters per day per animal overall, with Kurukshetra and Hisar respondents averaging 8.28 and 5.74 liters, respectively. The Z-test value of -9.209 indicated a highly significant difference in milk sale between respondents in Hisar and Kurukshetra, aligning with Nama and Choudhary (2020).

From Table 1, it was found that 51.7 per cent of Hisar respondents had a medium gross annual income, while 31.7 per cent and 16.7 per cent were in low and high categories. In Kurukshetra, 48.3 per cent had a medium income, 28.3 per cent had a low income and 23.3 per cent had a high income. Overall, 50.00 per cent of dairy farmers had a medium gross annual income, 30.00 per cent had a low income (up to 2.5 lac) and 20.00 per cent had a high income (>5 lac). The average gross annual income was 4 lacs, ranging from 80 thousand to 30 lac. The Z-test value of -1.523 indicated a non-significant difference in gross annual income between respondents in Hisar and Kurukshetra, consistent with Toor and Kaur (2022).

Communication profile of dairy farmers: The recent study revealed that approximately half (48.3%) of the respondents in Hisar had a moderate level of mass media exposure, while 43.3 per cent had a low level. In Kurukshetra, 38.3 per cent had a moderate level and 40 per cent had a high level of mass media exposure. The data in Table 1 showed that 43.33 per cent of respondents had a moderate level of mass media exposure, while 41.67 per cent and 15 per cent had high and low levels, respectively. Overall, the mass media exposure of respondents was below moderate, with an average score of 7.74. The Z-test value of -1.087 indicated a significant difference in mass media exposure between respondents in Hisar and Kurukshetra.

The data from Table 1 indicated that 40% of respondents in Hisar had a moderate level of extension contact for

obtaining information about dairy practices, followed by 38.3 per cent and 21.7 per cent with low and high levels, respectively. In Kurukshetra, 40 per cent, 38.3 per cent, and 21.7 per cent of respondents had low, moderate and high levels of extension contact, respectively. Overall, 39.17 per cent and 39.17 per cent of respondents had moderate and low levels of extension contact, while 21.16 per cent had a high level. The overall extension contact of respondents was moderate, with an average score of 7.63 out of a maximum possible score of 16. The Z-test value of -0.42 indicated no significant difference in extension contact between respondents in Hisar and Kurukshetra. These findings were consistent with Singh and Rewani (2022), who found a mean score of 7.35 for extension contacts with respondents. However, they differ from the findings of Prashanthi and Reddy (2022).

CONCLUSION

In conclusion, dairy farming is a crucial livelihood for landless laborers and marginal farmers nationwide. Aligning interventions with farmers' socio-economic profiles is essential for seamless integration. Targeted information improves the adoption of best practices, and prioritizing skill development is crucial. Strengthening market linkages enhances income potential, while sustainable practices benefit farmers and the environment. Gender-equitable opportunities are vital, considering the significant involvement of female respondents. Continuous research and innovation contribute to the growth of the dairy sector. Collaboration among policymakers and stakeholders can uplift the socio-economic well-being of dairy farmers and enhance overall productivity and sustainability.

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