

## Role and Status of Antecedent Characteristics of Dairy Farmers in Quality Milk Production

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### ABSTRACT

Raw milk quality is important in dairy value chain, where dairy farmer is the key client, who decides the shelf life of milk and milk products. To know about the impact of milk quality improvement programmes like Clean Milk Production, policy makers should know about the antecedent characteristics of dairy farmers. This study was conducted with this objective in Rajasthan state, where 120 dairy farmers from four district milk unions were selected by using multistage proportionate random sampling method. The results of the study revealed that, a large majority of dairy farmers were belonging to middle age group (34 to 51 years), 26.70 per cent dairy farmers were illiterate, followed by 19.20 per cent belonging to metric level education. Half of the respondents were found belonging to the medium category regarding their family education status. A large number of dairy farmers (80%) were found belonging in medium category for their experience in dairying *i.e.* 13 to 30 years. Majority of dairy farmers (70.84%) were having medium family size *i.e.* 6 to 9 members and social participation (68.34%). The 40.84 per cent dairy farmers were possessing medium land holding (2 to 4 ha.) 3 - 9 animals, Whereas 34.20 per cent dairy farmers were having their annual income between ₹1, 00,001 to ₹1, 50,000 per annum.

**Keywords:** CMP, DCS, dock, milk quality, socio-economic, socio-personal

### INTRODUCTION

In India fast deterioration in milk quality has been observed by the time it reaches from milk producer to dairy dock. This needs to be taken into consideration by introducing concept of Clean Milk Production (CMP) at the village level. Clean milk can be defined as milk coming from healthy milch animal possessing normal flavour, devoid of dirt and filth containing permissible limit of bacteria and essentially free from adulterants, pathogens, various toxins, abnormal residues, pollutants and metabolites (Gupta, 2003). Indian dairy sector needs to build its competitiveness on the basis of quality, productivity and efficiency to continue its march towards success in national and international market (Kurien, 2004).

The CMP involves thorough cleanliness at all phases of handling and stringent quality control and hygienic measures have to be adopted at farm level. The milk quality is determined by aspects of composition and hygiene of milk. Breeding, feeding, management system, genetics and many such facts mainly influence the

compositional quality (Singh and Gupta, 2014). Hygienic parameters are decisive for food safety, but these might also influence the composition of milk as it can be seen in case of mastitis with elevated numbers of somatic cells. CMP at producers' level includes hygienic norms, improved animal husbandry practices and regulatory requirements for milk production (Sohrab, 2004).

To achieve these attributes for producing clean milk at producer level and add it with dairy value chain, implementing agencies should know about the dairy farmers and their antecedent characteristics. The antecedent characteristics of the dairy farmers highlight those aspects or materials which already possessed by them. Information about these characters was very useful for measuring its considerable impact/ influence on knowledge, adoption, and communication behaviour and milk quality. These characters/ variables are critically analyzed here and their description presented in this paper.

The study was conducted in Rajasthan state of India, where Clean Milk Production Programme was started with

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collaborative efforts of National Dairy Development Board (NDDB) and Rajasthan Cooperative Dairy Federation (RCDF) in 2001. After its successful implementation government of India also allocated separate budget for it with the name of "Strengthening Infrastructure for Quality & Clean Milk Production" in Xth five year plan. This scheme still continue with increasing area of implementation in major states of the country.

### METHODOLOGY

This study was conducted to know the status of clean milk production at producer level in Rajasthan, where 21 district cooperative milk unions are in function. The milk shed area of four district milk unions (viz. Alwar, Bhilwara, Bikaner and Hanumangarh) was selected by using multistage proportionate random sampling method. Four Dairy Cooperative Societies (DCS) from each union were selected, out of that two were in CMP area and two in Non-CMP area. A list of dairy farmers was prepared from each DCS, who were pouring milk for the last two years. A total of 120 farmers were selected on the basis of proportionate random sampling. The variables (antecedent characteristics) were selected for the present study on the basis of the available literature, experts' opinion and personal experience of the researcher about the study area. These variables are discussed with their results in below mentioned heads.

### RESULTS AND DISCUSSION

#### Socio-Personal Characteristics

**Age:** The age of dairy farmers was selected as an independent variable for analyzing its impact on milk quality. It is a general perception that young persons are always more conscious about quality rather than old ones. Results in Table 1 indicated that majority of the farmers (73.34%) were in middle age category, *i.e.* 34 to 51 years of age; followed by 16.16 percent in old age category. On the other hand, only 10 out of 120 selected dairy farmers were in young age category *i.e.* upto 33 years.

The reason behind this higher percentage in middle age group was that, the present study was conducted under cooperative dairy societies where the members of DCS are always head of their family, which in general having middle age that is 40 to 50 years. These findings are in contrast to the observations of various researches *viz.*, Maity (1999), Saha (2002), Sarangi (2006), Ozcatalbas *et al.* (2010), and Singh and Datta (2013) who found that majority of the dairy farmers were in the middle aged category.

**Education:** The education is an integral part of any extension programme. The present study was conducted in the areas where CMP programme was in function *i.e.* CMP milk route in every milk union. A general attitude about education is that, the person who having more education, are always more conscious about quality of milk. The study revealed that about one fourth of farmers (26.70%) was illiterate. It is important to know that only ten farmers (8.30%) were found in the category of graduation and above level. A close view of Table 1 also suggests that 19.20 per cent of the dairy farmers were in the category of metric level followed by 17.50 per cent in middle and 12.50 per cent in senior secondary category. These results are in contrast to literacy percentage of Rajasthan (which is 66.11 %). It is interesting to know that all four milk unions of study area had a programme for education of dairy farmer's children, under which they are providing 1200 rupees/ student/ year in the form of non refundable scholarship. Saha (2002), Sri Latha (2005), Sarangi (2006), Sathyanarayan *et al.* (2010), and Mali *et al.* (2014) in their respective studies found similar trend *i.e.* higher percentage of respondents were in illiterate category.

**Family education status (FES):** The CMP is not in the hands of a person who is rearing the animal or a person who is pouring the milk at DCS. It is a combined responsibility of all the family members because it plays a vital role in maintaining the milk quality at pail as well as DCS level. The results in Table 1 show that half of the dairy farmers (51.67%) come under medium category regarding FES. Again, 34.17 per cent of the respondents were in high FES category, which is a good indication for launching new programmes on milk quality improvement. On the other hand, only 14.16 per cent dairy farmers are in low FES category. Pushpa (1996), Singh (2006), and Raval and Chandawat (2011) found the same results in their studies regarding FES.

**Experience in dairying:** Experience is an accumulation of time period which is spent by an individual to do something for a group of activities. CMP is a process which starts from mouth of an animal and ends in the mouth of a consumer. So, experience in dairying is an important element which plays major role in maintaining the milk quality. The general observation of researcher was that the farmers of Bikaner area had more knowledge by their experience regarding traditional practices of dairying and CMP but, in case of Alwar it was very poor.

**Table 1: Socio-personal antecedent characteristics of dairy farmers**

Characters	Category	Range	Frequency n=120	Percent	
Age (in years)	Young	Up to 33	12	10.00	
	Middle-aged	34 to 51	88	73.34	
	Old	Above 52	20	16.66	
Education	Illiterate	0	32	26.70	
	Primary	1	19	15.80	
	Middle	2	21	17.50	
	Matric	3	23	19.20	
	Senior	4	15	12.50	
	Secondary				
	Graduation and above	5	10	08.30	
Family education status	Low	<10.96	17	14.16	
	Medium	10.96 to 15.74	62	51.67	
	High	>15.74	41	34.17	
Experience in dairying (in years)	Low	<13	9	07.50	
	Medium	13 to 30	96	80.00	
Family size (Members)	High	>30	15	12.50	
	Small	Upto 5	17	14.16	
	Medium	6 to 9	83	70.84	
Social participation	Large	> 9	20	15.00	
	Low	<6.68	20	16.66	
	Medium	6.68 to 14	82	68.34	
	High	>14	18	15.00	

Table 1 revealed that majority of the dairy farmers (80 %) had medium level of experience in dairying *i.e.* 13 to 30 years, while only 12.50 per cent farmers were in more experience category followed by 7.50 per cent in low category. The number of years of experience were more, because Rajasthan is a desert state where livelihood of rural area is basically based on livestock.

**Family size:** A perusal of Table 1 showed that majority of dairy farmers (70.84%) had medium family size ranging from 6 to 9 members, followed by 15 per cent in large and 14.16 per cent in small family size category. These findings are in line of Sarangi (2006), Rathod *et al.* (2011), and Gebrekidan *et al.* (2012). Family size was selected as an independent variable because, it is a general perception of programme planners that if the family size is small then they can persuade the members for adopting and maintaining the milk quality easily.

**Social participation:** Participation of the dairy farmers in various organizations, either as a member or an office-bearer, has been presented in Table 1. It could be seen from table that majority (63.34%) of the dairy farmers were having medium level of social participation, while 16.66 per cent were in low level followed by 15 per cent as high level of social participation. All the respondents were members of

DCSs, where participation of a member was so high, because in cooperative system all decisions are in the hands of member farmers. It was observed that all the farmers participated in DCS, agricultural cooperative society and religious as well as community organizations. It would be useful to mention that researchers in the past, *viz.* Kumar (1987), Pushpa (1996), Premavathi (1997), Lahoti (2012) found that majority of farmers in medium category regarding social participation.

**Socio-Economic Characters**

**Land holding:** Regarding the land size of dairy farmers, it could be observed from Table 2 that most of the farmers (40.84%) had medium level of land holding *i.e.* 2 to 4 hectares, followed by small (27.50%), large (23.32%) and marginal (2.50%) level of land holding. Only 5.84 per cent farmers were in landless category. The large land holders were having more than four hectares land, which is three times more than national average land holding. The large number of farmers in medium category and their land size was 2 to 4 hectare, which showed similarity with average land size of Rajasthan state which is 3.38 hectare. The above findings are similar to Meena (2002), Sarangi (2006), Rathod *et al.* (2011), Singh and Datta (2013) who found that most of the respondents had medium size of land holding.

**Table 2: Socio-economic antecedent characteristics of dairy farmers**

Characters	Category	Criteria (Score)	Frequency (n=120)	Percent
Land holding (in hectare)	Land less	0	7	05.84
	Marginal	< 1	3	02.50
	Small	1-2	33	27.50
	Medium	2-4	49	40.84
	Large	> 4	28	23.32
Herd size	Small	<3	11	09.17
	Medium	3 to 9	89	74.16
	Large	>9	20	16.67
Annual income (in rupees)	< 50, 000	1	29	24.20
	50, 000 to 1,00,000	2	36	30.00
	1,00, 001 to 1,50,000	3	41	34.20
	>1, 50, 000	4	14	11.70
Milk production (Lit/ day/ household)	Low	<16	20	16.67
	Medium	16 to 33.49	80	66.66
	High	>33.49	20	16.67
Milk consumption (Lit/ day/ household)	Low	<5.98	16	13.34
	Medium	5.98 to 12.57	84	70.00
	High	<12.57	20	16.66
Milk sale (Lit/ day/ household)	Low	>8.57	22	18.33
	Medium	8.57 to 20.67	76	63.34
	High	<20.67	22	18.33

**Herd size:** It could be seen from Table 2 that a large number of farmers (74.16%) were in medium category i.e. 3 to 9 animals for possessing herd size, which is in extensive range but these findings seems to be logical too; because dairying is the main occupation of DCS members and majority of them were keeping good number of animals. On the other hand 16.67 per cent farmers had large herd size i.e. more than 9 animals followed by 9.17 per cent in small herd size.

Bhilwara milk union's dairy farmers were having large herds of Gir (an indigenous breed of cow) breed of cow which is famous for its high milk production in India. The past studies of this field like Sarangi (2006), Dechow (2011), Lahoti *et al.* (2012) and Mumba *et al.* (2012) are showing similarity with these results.

**Annual income:** The annual income of a respondent was that money which he got from selling of milk, milk products, dung, urine (in some villages of Bikaner farmers sold urine of cow for medicinal use in Ayurveda to NGOs), calves, milch animal *etc.* The major source of income was from selling of milk at DCS. The figures in Table 2 are showing that one third of respondents (34.20%) were in the category of ₹ 1, 00,001 to 1, 50, 000 per annum, which is very good amount in farming community.

Meanwhile, 30 per cent of the farmers were in the category under which their annual income was ₹ 50, 000 to 1, 00,000, followed by 24.20 per cent as less than ₹ 50000 annual earners. Only 11.70 per cent of farmers were found to earn more than ₹ 1, 50, 000 annually from dairying. It is good information for programme planners because money is not only the matter; in this economic socialism, money is the meaning of life, if we increase the rate of dairy products on the basis of quality of raw material then we assure that quality will be good, because no one wants to face loss. It is very important to know that, the Bhilwara, Alwar and Hanumangarh milk unions were started incentives for CMP, but it was only for Bulk milk cooler occupied societies, where DCS secretary was the client for award. These results are similar to Sarangi (2006), Dechow (2011), Lahoti *et al.* (2012) and Mumba *et al.* (2012).

**Milk production:** The present study revealed in the Table 2 that the majority of dairy farmers (66.66%) were in medium category of milk production i.e. 16 to 33.49 liters/ day/ household, followed by equal percentage (16.67%) in low and high category for milk production. The results were showing higher average milk production, the reason behind this was large herd size of

milk producing animals in Bhilwara and Bikaner milk union. Das (2003), Sarangi (2006) and Mali *et al.* (2014) and also reported similar results about average milk production with 17 liters/ day/ household.

**Milk consumption:** In case of milk consumption figures in Table 2 revealed that the large numbers of farmers (70%) were in medium category for milk consumption i.e. 6 to 12.57 liters/ day/ house hold. The consumption of milk was not only for the dietary purpose, it was also used for preparing milk products, which were sold in market for getting more money *e.g.* Ghee in Bikaner and *Khoa* in Alwar area. For this reason average milk consumption was so high.

**Milk sale:** As far as milk sale is concerned, Table 2 revealed that the respondents belonging to high category (18.33%) were selling more milk than 20 liters per day. The majority of them (63.34%) were in medium category i.e. 8.57 to 20.67 liters/ day, whereas, only 18.33 per cent were in low category of milk sale. These findings are in contrast to the observations of various researchers *viz.*, Maity (1999), Sarangi (2006), Rathod *et al.* (2011), Singh and Datta (2013) who found that majority of the dairy farmers were in the medium category of milk sale.

## CONCLUSION

Raw milk quality is important in dairy value chain, where producer is the key client, who decides the shelf life of milk. To know about the impact of milk quality improvement programmes, like Clean Milk Production Programme, policy makers should know about the antecedent characteristics dairy farmers. These attributes will be useful for providing need gaps and available resources, which supports to planning and execution at filed level. This study is unique in its type where milk quality was tested with these characteristics and compared with non-programme area as well as intervening variables like knowledge, adoption, and communication behaviour.

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