An analysis of perception of dairy farmers regarding clean milk production in the national capital region (NCR)

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ABSTRACT

Though India is the largest milk producer in the world yet its contribution in export market is very low, the reason behind which are the quality and safety aspects of the raw milk; consumers all over the world have become quality conscious and prefer high quality products. Conditions of peri-urban dairies are appalling; milk from these dairies is not safe for human consumption and animals live in conditions that do not provide anything for their natural needs. There is no access to good quality drinking water, green feed, veterinary care or space to move around. In this context the study was undertaken in national capital region where six districts were selected by using proportionately stratified random sampling technique from NCR viz NE Delhi, NW Delhi, Panipat, Sonepat, Baghpat and Alwar. Twenty marginalized dairy holders from each 6 selected districts were selected randomly. Thus a total of 120 respondents were selected to study the perception of the dairy farmers regarding clean milk production practices. The findings of the study revealed that higher favourable perception was there among respondents towards hygiene of milker and milk quality (natural flavor, high fat and SNF) whereas lower favourable perception was found regarding isolation of diseased animal and use of oil/lubricants over teats. The study suggests facilitating training and extension activities for the dairy farmers to create more awareness regarding clean milk production among them.

Keywords: Dairy; milk; perception; production; farmers

INTRODUCTION

India has the biggest milk industry in the world producing more than 180 million tons of milk in 2018. This is 22 per cent of the world's annual production (Buchholz 2019). As a global leader in milk production the total bovine population in India is estimated at 302.79 million out of which the total number of cattle is 192.49 million and buffalos is 109.85 million (Anon 2019a).

Milk is one of the major outputs of dairy sector and most of the milk in the country is being produced by small and marginal farmers coupled with landless labourers. India has now attained the status of world's largest milk producing nation with an annual production of 187.7 million tons and subsequently the per capita availability of milk hovering around 394 g/day (Anon 2019b).

The annual growth rate in milk has been estimated at 6.50 per cent. Within livestock sub-sector dairying is an important economic activity accounting for about 67 per cent of the value of output of livestock sub-sector in agriculture (Anon 2018b). However the global concern with respect to food safety and clean milk production has gained significance over the years among the consumers and the producers. Milk is easily contaminated and perishable commodity as it is an ideal medium for bacterial growth. Hence the employment of hygienic practices right from milking at the farm level to the consumption is essential. Clean milk can be well defined as milk of healthy milch animal possessing normal flavor containing permissible limit of bacteria and essentially free from adulterants, pathogens, various toxins, pollutants and metabolites (Gupta 2003). It can also be stated as raw milk that has been produced in the udder of healthy dairy animals, handled under

hygienic conditions and contains only allowed quantity of pathogens and chemicals. The components to be considered in clean milk production (CMP) practices are housing of dairy animals, healthy herd management, cleaning of animals, cleaning of utensils, milking process hygiene, milker's hygiene, transportation and storage of raw milk. The first step towards CMP should be education and training of producers on hygiene methods of milking and good animal husbandry practices (Singh and Gupta 2015). It is argued that consumer quality perception of dairy products is characterized by four major dimensions viz hedonic, health-related, convenience-related and process-related quality. Two of these viz health and process-related quality are credence dimensions (Grunert et al 2000). The health care of the animal plays a crucial role in clean milk production at producers' level and includes sanitary norms, improved dairy husbandry practices and regulatory requirements for milk production (Manjunath et al 1997). A Gujarat-based study revealed that less number of farmers (29.17%) used separate clean and dry place to milk their animals. About 67.0 per cent farmers washed hind quarter or back of animals before milking; moreover 91.25 per cent washed udder/teat of animals and 87.08 per cent washed their hands prior to milking. After milking 56.67 per cent farmers wiped udder to prevent infection though none followed post-milking teat dipping. Cleaning of utensils was mostly done by clean water (66.25%) followed by detergent (32.08%) but least per cent preferred clay/ash (1.67%) (Patbandha et al 2014). There is utmost necessity of implementation of clean milk production practices by the Indian dairy farmers (Staal et al 2006) and especially it was seen that the farmers had low level of knowledge in housing and animal healthcare (Gill and Singh 1977). Another study revealed that majority of dairy farmers had medium level of knowledge on clean milk production practices with few belonging to higher adopter category (Maity et al 2002). Most of the dairy farmers expressed their readiness to follow clean milk production procedures even if they were not paid higher price for milk (Radder and Bhanj 2011). Coming to gender perspective, majority of the female farmers had low level of knowledge on clean milk production practices (Saini 1980). It was also observed that landholding, extension contact, scientific orientation and knowledge regarding clean milk production practices had positive and significant correlation with adoption of clean milk production practices of dairy farm women (Gade et al 2012). However in the present context conditions of urban and peri-urban dairies are appalling. It was recorded that 70.00 per cent of milk samples in Delhi were not confirming to standards. Dairy animals in these areas suffered from diseases that ranged from mastitis, brucellosis to leukemia (Anon 2018a).Challenges also lie in maintaining food security of large number of urban population as much of the increased demand for dairy products is concentrated in urban and peri-urban areas. Keeping this in view, the present study focused on the existing clean milk production practices of marginalized dairy holders as well as their perspective for the same in the national capital region.

METHODOLOGY

The study was undertaken in national capital region. Six districts were selected out of four states/ UT by using proportionately stratified random sampling technique from NCR viz NE Delhi, NW Delhi, Panipat, Sonepat, Baghpat and Alwar. Twenty marginalized dairy holders from each district were selected randomly and only those dairy holders were considered who had less than 10 animals with due care that he/she did have major source of income from dairying. Thus a total of 120 respondents were selected in the study area. Structured interview schedule was prepared through literature and suggestions of the experts. Pre-testing of schedule was conducted and items were modified/ removed. Weighted score for each statement was calculated and ranking on the basis of weighted score was used to document the most perceived practice on CMP. Scoring of 2, 1 and 0 was given to 'Always', 'Sometimes and 'Never' perceived practice respectively. The total score was calculated for each statement by summing up the scores.

$$\text{Weighted score (\%)} = \frac{\text{Obtained score}}{\text{Maximum score}} \times 100$$

Gibson (1959) defined perception as the process by which an individual maintains contact with the environment. The following steps were considered to measure the consumers' perception towards clean milk production. The first step in the construction of perception scale was to collect statements regarding CMP practice. List of 31 statements was collected through discussions with subject matter experts and ascertaining through literature. These statements were given to 30 judges for validation. The judges were requested to scrutinize each statement on a three-point continuum viz 'Agree' (A), 'Undecided' (UD) and 'Disagree' (DA) indicating the suitability of the

statements as per objective having score 2, 1 and 0 respectively. The total score of individual judges was calculated by summing up the score of each statement. Based upon the total individual scores the judges' scores were arranged in a descending order. The top 25 per cent of judges with their total individual scores were considered as high group and the bottom 25 per cent as the low group so that these two groups provided criterion groups in terms of evaluating the individual statements. The t-values were worked out in order to distinguish the responses of high and low groups for the individual statements by using the under mentioned formula (Edwards 1969). The statements having t-value ≥1.75 were selected in final scale. The reliability of the measuring instrument was calculated using Cronbach's alpha.

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum_{i-1}^{n}(X_H - \bar{X}_H)^2 + \sum_{i-1}^{n}(X_L - \bar{X}_L)^2}{n(n-1)}}}$$

where $\Sigma\bar{X}_H$= Mean score on a given statement for the higher group, $\Sigma\bar{X}_L$= Mean score on a given statement for the lower group, $\Sigma X_H{}^2$= Sum of squares of the individual score on a given statement for the higher group, $\Sigma X_L{}^2$= Sum of squares of the individual score on a given statement for the lower group, ΣX_H = summation of scores on given statement for the higher group, ΣX_L= summation of scores on given statement for the lower group, n= Number of subjects in lower and higher groups, t= Extent to which a given statement differentiates between higher and lower groups

RESULTS and DISCUSSION

It is evident from Table 1 that there was higher favourable perception among respondents regarding washing of hands by the milker. Majority of consumers wanted that the milk that they were going to consume should come from hygienic conditions and the one bringing it should be neat and clean along with proper washing of the utensils. The study revealed that dairy farmers were more quality concerned and had a higher favourable perception regarding milk quality in terms of natural flavor and high fat and SNF content. This could be due to increasing per capita income as well as increasing awareness regarding health and hygiene through mass media exposure among consumers. However the presence of extraneous material like feed, straw etc indicated that clean milk production was not followed. This might be due to irregular cleaning of the cow shed. It was also found that majority of the dairy farmers washed udder with antiseptics before milking as there was more susceptibility to bacterial infection which in turn contaminated the milk. It was noteworthy to elucidate that almost no milker indulged him/her in smoking, tobacco chewing prior to or during milking and further ensured proper hygiene at the location of cattle yard, milking area and point of sale.

It was also observed that milk produced under clean and hygienic condition had more shelf-life and fetched better prices. Typical sweet taste without off-flavour indicated that clean milk production practice was followed in a proper manner. It was observed that majority of the milkmen did not have proper awareness regarding clean milk production practices. This could be due to lack of extension and training facilities provided by the governemnt extension workers on clean milk production practices. Many dairy farmers were also found to be reluctant toward following clean milk production practices as monetary return was not associated with it. However it was ensured that the colour of milk was white (buffalo) or yellowish white (cattle) and quality of the milk was not compromised.

Further it was observed that some producers were not following clean milk production practices due to hurried disposal of milk for sale and very few dried their utensils before milking for clean milk production. The presence of sediments in the utensils contaminated and spoiled the quality of milk. It was noticed that few dairy farmers used oil lubricants over teats during milking which was found to be unhealthy practice thus aiding to unclean milk production. Also many kept their diseased animals isolated from the healthy ones as there were more chances of spread of the disease/outbreak. In case of some dairy farmers it was observed that actual milking was done at separate place from holding pens and was ensured that the separate place allotted for milking was hygienic and cleaned on a regular basis. It can be concluded from the study that dairy farmers perceived clean milk when the milker was clean, utensil was clean and milk was milked under hygienic conditions. However low perception was observed among the consumers regarding isolation of diseased animal and avoidance to use oil and lubricant during milking over the teats which were ranked low (Table 1).

Table 1. Perception of dairy farmers regarding clean milk production (n= 120)

Statement	t-value	Weighted score	Weighted score (%)	Rank
Milker should wash his hands thoroughly and dry them before milking	4.41	240	100	I
The milking utensils should be properly washed by detergents before milking	3.65	224	93.33	II
Consumers are more concerned about quality milk nowadays	2.58	208	86.66	III
Presence of extraneous material like feed, straw etc indicates that clean milk production is not followed	1.96	196	81.66	IV
Washing of udder with antiseptics before milking is essential for clean milk production	3.66	186	77.5	V
Milker should not indulge himself in smoking/tobacco-chewing prior to or during milking	4.97	176	73.33	VI
It is essential that the location of cattle yard, milking area and point of sale should be clean and hygienic	2.06	168	70	VII
Milk produced under clean and hygienic conditions has more shelf-life	1.98	156	65	VIII
Typical sweet taste without off-flavour indicates that clean milk production practice is followed	3.22	144	60	IX
Milkers do not have proper awareness regarding clean milk production practices	1.89	136	56.66	X
Producers are reluctant toward following clean milk production practices as monetary return is not associated with it	1.93	128	53.33	XI
The colour of milk should be white (buffalo) or yellowish white (cattle)	2.56	122	50.83	XII
Producers are not following clean milk production practices due to hurried disposal of milk for sale	3.25	114	47.5	XIII
It is essential to dry the utensils before milking for clean milk production	5.37	110	45.83	XIV
Presence of sediments indicates that clean milk production is not followed	4.62	104	43.33	XV
Use of oil lubricants over teats during milking is harmful aiding to unclean milk production	4.09	100	41.66	XVI
It is essential to keep the diseased animals isolated from the healthy ones	1.79	96	40	XVII
Actual milking should be done at a separate place from holding pens	1.85	88	36.66	XVIII

CONCLUSION

It can be concluded from the study that majority of the dairy farmers sampled from national capital region had higher favourable perception regarding washing of hands by the milker and cleaning of utensils. They were also more concerned about quality of milk such as good natural flavour and high fat and SNF content. However lower perception was observed among the consumers regarding isolation of diseased animal and avoidance to use oil and lubricant during milking over the teats. It can be inferred that consumers perceived clean milk when the milker was clean, utensil was clean and milk was milked under hygienic conditions. The present study also suggests that there was strong need to sensitize and train the farmers and other stakeholders about clean milk production in dairy farming through adequate extension, policy and financial support.

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