RESEARCH PAPER | Sociology | Volume : 3 | Issue : 7 | July 2013 | ISSN - 2249-555X

Analysis of the Clean Milk Production Practices of Dairy Farmers of Kerala

KEYWORDS: Clean Milk Production, dairy farmers, knowledge, adoption

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ABSTRACT *Clean Milk Production (CMP) is very important in dairy farming. Several hygienic measures should be practiced for production of clean milk. CMP practices of dairy farmers of a selected gram panchayat of Palakkad district of Kerala state were analyzed in terms of knowledge and adoption regarding the practices using a semi- structured interview schedule developed for the purpose. The data were analysed using frequency and percentage.*

On analysis, it was revealed that more than half of the respondents (77%) had medium knowledge of CMP practices and the rest were in the low category (23%). None were in the high category for knowledge of CMP practices. For adoption of CMP practices, majority of the respondents were in the low category (60%), followed by medium (33%) and high categories (1%).

Introduction
India has emerged as the highest milk producing country in the world (Sah et al, 2002) with an annual production of more than 81million tones. With the introduction of GATT and WTA, marketing of milk to any foreign country has become a reality. Milk is a highly perishable commodity. Contaminated milk deteriorates quickly and produces diseases if consumed. Therefore extreme care has to be taken in production, storage and transport of milk.

Clean milk does not mean making the milk free from extraneous matters by passing it through sieve or muslin cloth. It actually means the 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. There are mainly four factors to be considered in Clean Milk Production (CMP) practices.

- **Animal hygiene**

The animals should be maintained in hygienic environment for production of quality milk. It should be healthy. It should be fed with nutritious and complete feed which consist of roughages and concentrate mixtures and it may be in mash, pellet or in block form. Many factors influence the frequency of mastitis infection and management is particularly important. New infection is most common at drying off, at calving, in older cows and in poorly managed cows. The tests for changes in milk composition are simpler and some may be carried out on the farm (eg. California Mastitis Test).

- **Milking hygiene**

It covers management of personal hygiene of the milker and milking process. Milking should be done using the full hand. It is best to milk rear quarters first as they contain the higher proportion of milk. Pressing the teats using the thumb is not a good practice. It should be avoided otherwise the teats get damaged and mastitis may develop. The milking should be completed as quickly as possible in about 5-8 minutes. Milking should be done completely and if milk is left in the udder it will become a source of infection and causes mastitis to develop. The first milk should be tested for presence of mastitis every time prior to milking. If suspected for mastitis the particular quarter should not be milked and treated.

- **Equipment hygiene**

Milking vessels must have smooth milk contact surfaces with minimal joints and crevices. Renew rubber components of the milking machines at regular intervals. Water for dairy use must be clean. Detergents are needed for cleaning dairy equipments. Clean the milking equipment and cooler by rinsing in clean water, scrubbing in hot (≥45°C) detergent/disinfectant solution and finally rinsing in chlorinated (50 ppm) water. Drain all the milking and ancillary equipment in a clean place before storage. Direct-to-can milking is a very simple, low cost system of milking, cooling and cleaning specially devised for parlour milking. Milk is drawn directly from udder to milk can, eliminating milk lifting, carrying and tipping.

- **Processing hygiene**

It includes management practices during collection and transportation of milk. The milk secreted into an uninfected cow's udder is sterile. Invariably it becomes contaminated as it passes through ducts and from reservoirs of udder and from external contamination from milker, utensils or from environment and milk is an excellent medium for bacteria, yeasts and moulds that are the common contaminants(Nanu et al, 2007). Their rapid growth, particularly at high ambient temperatures can cause marked deterioration, spoiling the milk for liquid consumption or manufacture into dairy products. This can be avoided by adopting the simple, basic rules of clean milk production.

Milk at the time of milking will be at the body temperature. Preserving the milk at that temperature causes deterioration quickly. As such the milk should be chilled and stored. Chilling of milk enhances the storage time without spoiling. While transporting milk to the dairies also the cold chain should be maintained for preventing deterioration. The milk has to be cooled to a temperature below 50C by using refrigerators / water coolers preferably within 2 hours after milking. The milk can be cooled by immersing the cans of milk in clean, running water.

With this background, we had conducted the study to assess the knowledge and adoption of the dairy farmers regarding clean milk production (CMP) practices.

Review of literature
Nanu et al. (2007) suggested that the hygienic practices followed during the production of milk at the point of production (farmers' level) needs an improvement with regard to reduction in microbial count and overcoming the impact of the harmful pathogens. The presence of coliform, faecal streptococci and E. coli in milk indicated contamination of milk from the environmental sources and also from human and animal sources. Hence strict hygiene and health education needs to

Volume : 3 | Issue : 7 | July 2013 | ISSN - 2249-555X

be implemented to minimize contamination occurring in the milking barn.

Rao and Rani (2007) had reported that implementation of CMP practices could reduce the intensity of mastitis by 70-80 percentage and increase milk production by 0.5 to 1litre in their study area.

Prejit et al (2011) reported that evaluation of various critical points of bacterial contamination of milk from production and processing sites revealed high microbial count from milk pail, milker's hand washings and package machine wash indicating the important sources of contamination. They reported that the highest mean total count was obtained from milker's hand wash.

Welearegay et al (2012) reported that about 43.9% of the dairy farm owners used common towel for all cows to dry the udder and about 47.7% dairy owners used bare hand to dry the udder. Particularly, in large size farms, most (75%) producers use collective towel while about 12.5% neither wash nor dry the udder of cows. Most of the owners used warm water and detergent for cleaning milk handling equipment. However, there were some dairy farmers who cleaned milk handling equipment with cold water without detergent after each usage.

It was reported by Depiazzi and Bell (2002) that pre - milking udder preparation and teat sanitation play important part in the microbial load of milk, infection with mastitis and environmental contamination of raw milk during milking.

Materials and methods

Palakkad district being the highest milk producing district of Kerala state was selected for the study. The vandazhy gram panchayat was selected randomly. Sixty dairy farmers of Mangalam Dam APCOS were selected and the data were collected during the focus group discussion method. Knowledge and adoption of dairy farmers on clean milk production practices were analysed using a semi- structured interview schedule developed for the purpose. The knowledge test consisted of items on housing and feeding of cattle, vaccination and deworming schedule for cattle, knowledge and diagnosis of common diseases, endo and ecto parasites of cattle and control and management of mastitis. The scale of adoption consisted of 11 CMP practices on which the dairy farmers could respond as whether adopting or not adopting. The data were analysed using simple statistical procedures such as frequency and percentage.

Results and discussion

TABLES

Table 1. Profile of dairy farmers n=60

Sl. No	Particulars	Range	Frequency	Percentage
1	Age	Young	08	13
		Middle	40	67
		Old	12	20
2	Education	Illiterate	02	03
		School educated	48	80
		College educated	10	17
3	Annual income	Less than 50000	12	20
		50001-100000	42	70
		Above 100001	06	10
4	Prior experience in dairy farming	No experience	08	13
		Up to 5 years	44	74
		More than 5 years	08	13
5	Herd size	Up to 3 cows	54	90
		More than 3 cows	06	10
6	Daily average milk production	Up to 10 litres	58	97
		Above 10 litres	02	03
7	Knowledge on clean milk production practices	Low	14	23
		Medium	46	77
		High	00	00
8	Adoption of CMP practices	Low	36	60
		Medium	20	33
		High	04	07

Profile of dairy farmers can be seen in Table 1. On analysing the profile of the respondents, it was revealed that majority of the dairy farmers were in the middle age group (67%), having school education (80%), and in the category of Rs. 50000-100000 of annual income (70%). Majority of them were having up to 5 years of experience in dairy farming (74%). Most of them reared up to three dairy animals (90%). Daily average milk production of most of them was only up to 10 litres (97%). More than half of the respondents had medium knowledge of clean milk production practices (77%) and the rest were in the low category (23%). None were in the high category for knowledge of clean milk production practices. For adoption of CMP practices, majority of the respondents were in the low category (60%), followed by medium (33%) and high categories (1%).

Table 2.CMP practices followed by the dairy farmers n=60

Sl. No	CMP practice	Adopters	Percentage
1	Full hand milking	56	93
2	Cleaning of the utensils using detergent	52	87
3	Proper feeding of animal	0	0
4	Ensuring personal hygiene of the milker	12	20
5	Proper cleaning of shed	0	0
6	Cooling of milk for increased keeping quality	10	16
7	Checking the first strip of milk for any abnormality	06	10
8	Complete evacuation of udder in each milking	36	60
9	Using teat dip solutions	0	0
10	Ensuring that animal has to be stood up at least 15 minutes after milking	0	0
11	Giving adequate potable water for drinking	0	0

CMP practices followed by the dairy farmers are shown in Table 2. Most of the respondents were practising the full hand milking method (93%) and cleaning of the utensils using detergent (87%). Only a few were ensuring personal hygiene of the milker (20%) and cooling of milk for increased keeping quality (16%). Only three of the dairy farmers (10%) responded correctly for checking the first strip of milk for any abnormality. More than half of them knew that the udder should be completely evacuated in each milking (60%). Teat dip solutions like iodophores / Savlon were not known to any of the respondents. Nobody was ensuring that animal has to be stood up at least for 15 minutes once milking is done. Nobody was giving ad libitum potable drinking water for cattle. None of them was giving importance to proper feeding of animal and proper cleaning of shed.

Almost contradictory findings were reported by Hassan (2011) while studying the pattern of adoption of CMP practices of dairy farmers of Nadathara panchayat in Thrissur district of Kerala state. There were 16.67 per cent of dairy farmers in low category, 40 per cent in medium category and 43.33 per cent in high category for adoption of CMP practices.

Conclusion

Milk is one food commodity and there can be adverse effect on its quality if proper care is not taken during production, procurement and transit. Milk is a raw material, and the quality of all products made out of it depends on process and raw material (Prejit et al, 2011). If raw material has good quality, then finished product will have better quality. Strategies like cleanliness of milch animals, healthy animal, cattle care

Volume : 3 | Issue : 7 | July 2013 | ISSN - 2249-555X

and personal hygiene of milking person, cleanliness of milking place and cattle-shed, cleanliness of milking vessel and utensils of milk collection at the society, and, responsibility lies with producers for speedy and time bound follow-ups of all activities right from the point of milk production by milch-animals.

The attainment of proper hygiene in dairy farm improves economic benefit of the producer and health safety perspectives in consumer. It is therefore critically important to ensure high quality **raw milk** produced from healthy animals under hygienic conditions and that control measures are applied to protect human health. Therefore, it is recommended that training and guidance should be given to dairy farmers and emphasized the need for hygienic practices at the farms. Meanwhile, information on health hazards associated with contaminated **raw milk** should be extended to the public, so that consumption of unhygienically produced **raw milk** could be avoided.

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