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Popularisation of Clean Milk Production Practices through Farm Field School Approach

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ABSTRACT

Small and marginal farmers of India contribute 80 per cent milk production. Quality milk production needs to be accomplished in smallholder dairy production system by adopting mastitis prevention measures through promotion of clean milk production (CMP) practices and techniques. In this milieu, Krishi Vigyan Kendra, Namakkal conducted a farm field school (FFS) on CMP at Samayasangali village of Pallipalayam taluka of Namakkal district. Farm school was conducted for twenty five women on fortnight interval focused on clean milk production practices along with scientific dairy farm management. The impact assessment was carried out with well-structured pre tested interview schedule and found that cent percent participant farm women were aware of clean milk production practices taught and more than half (60%) of them adopted regular teat dip for udder wash, cleaning of hands and utensils before milking and a small percentage (3%) of them adopted fortnightly usage of CMT kit for assessing subclinical mastitis.

Key words: Adoption, Clean milk production, Dairying, Extension approach, Farm field School.

INTRODUCTION

Mastitis adversely affects animal health, quality of milk, and economics of milk production. At macro level it affects and causes huge financial losses (Sharma *et al.,* 2007) and annual losses in the dairy industry due to mastitis was almost 2.37 thousand crore rupees in India (Lakshmi, 2016) and subclinical mastitis also causes economic loss and attributed 75% loss of milk production (Hamadani *et al.*, 2013). Further in the context of globalized market and increasing awareness of consumers, there is a great emphasis on quality of milk. In addition to this, fast deterioration in milk quality has been observed by the time it reaches from milk producer to processing plant and one of the major factors for low export of our dairy products. Thus, a holistic approach was needed for Indian dairy sector which 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).

Prevention is the key in mastitis control. Preventive measures such as proper milking procedures, improved milking hygiene and housing management and post-milking teat dipping (Arnold, 2011) have a significant effect on the reduction of mastitis cases. For improving quality of milk, cleanness of milking man, milking vessels, milking methods etc becomes vital. This scenario propels strict adherence of CMP practices along with mastitis controlling strategies to achieve quality milk production and minimise economic loss. The extension approaches followed earlier were of linear-top-down, restrictive in nature and hinders its ability to stimulate the much needed break through to promote innovation and adoption among farmers

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Table1. Awareness on technological solutions of CMP and other associated practices. n=25

Sr. No.	Technological solutions/practices	Before FFS	After FFS	X^2Value
A.	Using of disinfectant in animal shed cleaning			
	Aware	4	15	8.489**
	Not Aware	21	10	
B.	Cleaning of hands with antiseptic solution(s)			
	Aware	5	25	30.083**
	Not Aware	20	0	
C.	Washing of udder with Antiseptics (KMNO4)			
	Aware	0	25	46.080**
	Not Aware	25	0	
D.	Use of California Mastitis test			
	Aware	0	11	11.655**
	Not Aware	25	14	
E.	Use of White side test			
	Aware	0	6	4.735*
	Not Aware	25	19	
F.	Feeding Management after Milking			
	Aware	7	25	25.087**
	Not Aware	18	0	
G.	Micro nutrient feeding			
	Aware	14	25	11.655**
	Not Aware	0	11	
H.	Preventive health Measure- Deworming			
	Aware	6	25	27.504**
	Not Aware	0	19	
I	Preventive health Measure-Vaccination			
	Aware	12	25	14.969**
	Not Aware	0	13	

*X^2 Chi square * Significant at 0.05 level of probability ** Significant at 0.01 level of probability*

(Byerlee *et al.*, 2007). These resulted in poor knowledge and poor adoption of CMP at farm level. Hundal *et al.* (2013) also observed that 87.30 of the farmers had medium knowledge on CMP. Added researchers reported that awareness among the farmers on milking methods and post milking dips were 38 and 31 % respectively. Further, adoption of personal hygiene, checking of abnormality in first strip of milk, use of teat dip, feeding of animals after milking among farmers ranged from 0 to 20% (Jacob and George, 2013). At the same time globally FFS, a participatory group based learning for adult learning that operates in the farmers field had gained wider acceptance in crop extension programs. This approach emphasis on empowering farmers to enhance their farm skills and to make

critical decisions based on available information and knowledge through a process of sharing experiences and testing ideas for adoption. Thus, this study makes an attempt with FFS approach to popularize clean milk production and mastitis prevention techniques and assess the impact of FFS programme on awareness and adoption of clean milk production and other practices among participant farmers.

MATERIALS AND METHODS

Samayasangali village of Palliplyam taluk of Namakkal district of Tamil Nadu was purposively selected as a representative village for FFS. This village has considerable number of dairy animals with high milk pouring capacity. A pre-survey was conducted with Government owned and private milk collection centres for assessing incidence of mastitis through California Mastitis test. This test was performed in the pooled milk samples of animals that arrived from dairying households to milk collection centres. About 60% of the farms in the identified village had sub clinical mastitis incidence. Based on the above facts, farm field school was finalised in the above village.

Farm school was carried out with participation of twenty five women on fortnight interval with a focus on identified critical interventions. The assessment on awareness and adoption of technological solutions of CMP and other associated practices was carried out with well-structured pre tested interview schedule before FFS initiation and six month after completion of FFS. Differences in awareness of farmers in technological solutions regarding CMP and associated practices were analysed using Chi-square (x^2) test, while differences in adoption were interpreted using descriptive statistics.

RESULTS AND DISCUSSION

Awareness on Technological solutions of Clean Milk Production and other associated practices

It was observed (Table 1) that the intervention with farm field school had significantly ($p < 0.001$ level) influenced the awareness on cleaning of animal shed with disinfectant, washing of hands with antiseptic solution(s) prior to milking, rinsing of udder with antiseptics (KMNO4), use of california mastitis test for screening of sub-clinical mastitis, feeding management after milking, deworming, vaccination and supplementation of mineral mixture. Added the awareness on white side test also improved at $p < 0.05$ level. This was in line with observation of Binkadakatti (2012) who found that awareness and knowledge on various dairying practices were low among dairy farmers who had to rely on the conventional methods of extension provided by various organisations or depend upon fellow farmers for information.

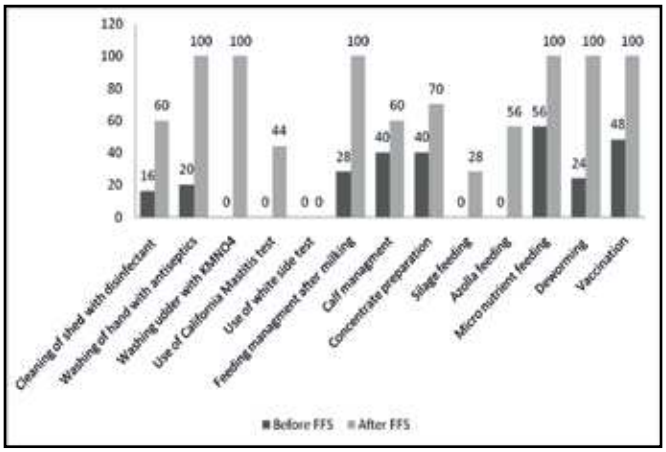

Figure 1. Adoption of Technological solutions of Clean Milk Production and other associated practices by FFS beneficiaries (in percentage)

A complete adoption was noticed in washing hands with antiseptics, rinsing of udder with KMNO4, feeding management after milking, supplementation of mineral mixture, deworming and vaccination. Kumar *et al.* (2020) found that after KVK's intervention through training programme animal and milkers hygiene practices were adopted by 60 and 50 % farmers, respectively. In the study area as critical inputs such as teat dip cups and KMNO4 were easily accessible to the farmers through KVK, private institutions, state animal husbandry department and open markets, has motivated farmers for absolute adoption of above technological solutions.

As unadorned practices such as feeding after milking does not involves any cost to farmers may be the reason for complete adoption. Supplementing of mineral mixture was adopted completely may be due its immediate tangible result observability in quality (Solid non fat and fat levels of milk) and quantity of milk produced. Sharma *et al.* (2014) found that adoption of mineral mixture was increased by 18.75% through training intervention while Meena *et al.* (2009) reported that among farmers who are bound to be served by extension agencies using conventional approaches did not adopt mineral mixture feeding.

The cleaning of shed with disinfectant and usage of California mastitis test (CMT) has been adopted by 60 and 44 % of the beneficiary farmers. Bafanda *et al* (2018) stated that through training programs of dairy co-operatives nearly 18% farmers adopted the practice of cleaning of shed with disinfectant. While this study found that farmers did not use White side test due to non availability of reagents and its complex procedure.

It was found that FFS has increased the awareness and adoption of promoted technologies ranged from 44 to 100% except White side test. Thus FFS which emphasis participatory learning aiming to share knowledge and skill at farmer's field produces more tangible results. The skill transfer activities and demonstrations in FFS may have increased the confidence level to adopt the practices in contrast to conventional extension approaches which increased knowledge and awareness and not influenced adoption behavior (Shelly, 2020 and Chander and Chand,2020). Further, it was noticed that among the promoted technological innovations certain were completely / partially adopted while some were completely rejected. Through dairy co-operative extension services, clean milk practices were adopted by 68 % of the milk pourers (Kumar and Prakash, 2017). Thus most technologies were rejected due to the functional gap as they were spawned in the laboratory (Rathod and Chander, 2015; Rangnekar, 2014 ; Thirunavukkarasu *et al,* 2021)). Thus, technology generators need more focus to improve technology in performance, user friendliness and suitability to farming situations (Thirunavukkarasu and Narmatha, 2016).

In this study, beneficiaries had better awareness on dairy innovations through participatory technology diffusion programmes (FFS) is in line with Samantha (2014). The farm field school had highly significant associations on awareness of majority of the promoted technologies except highly computational practice (calculation of weight of animal). Thus, knowledge gain among farmer gave confidence to use technologies and gain more experience with the new innovation (Nicholson *et al.,* 1999). Thus, resulting in adoption of major chunk of technologies promoted. That FFS is a better approach to enhance farmers` technical knowhow of complex technologies/ practices (Godtland *et al*, 2004) and adoption of the same. Some of the technologies (cleaning of shed with disinfectants and use of California mastitis test) were not adopted by all beneficiaries. This may be due to various reasons such as non availability of inputs, skill needed for interpretation of results and requirement of additional human resources. Therefore, enhancing the dissemination process of information about these technologies and ensuring relationship between farmer, extension workers and researchers for fine tuning of technologies may facilitate better adoption. Further, adopting participatory technology development process in technology development programmes may be helpful to avoid complete rejection of technologies. FFS approach empowers farmers using experiential and participatory learning techniques (Samantha, 2014).

CONCLUSION

This study highlighted that the FFS beneficiaries have higher awareness in most of the proposed technological interventions of clean milk production and associated practices, but the rate of adoption did not match with the awareness level and may be mainly due to the time gap, critical

input availability, complexity, observability and compatibility of the intervened techniques. In an overall the participatory technology dissemination process through FFS has considerable impact on innovation diffusion programmes in dairy sector. Further, making access to technologies, strengthening the linkage of farmer-extension-research and promoting participatory approach in technology development process has potential impact in addressing productivity bottlenecks and health related issues in dairying.

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