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A CASE STUDY

Quality control practices at BMC centre - A comparative study

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ABSTRACT

Raw milk quality is one of the most important factor before processing of milk and milk products. It is the main factor which is responsible for deciding the quality of end products. The present study was carried out at the selected BMC centre of a FPO owned dairy unit in Chittoor district of Andhra Pradesh. The principal objective of the study was to draw a comparison between BMC standards of NDDB and standards of selected BMC centre. The findings of the study show that there are no major deviations except delay in opening and closing timings for milk collection. As a result preparation time is reduced hindering the efficiency of milk collection process. BMC unit is well-being running manually by operator and switch was being turned off once BMC centre milk temperature touches 4°C and starts at 6°C, due to this delay in manual cutoff the milk is being crystallized. As per NDDB standards auto mode is recommended so that the BMC switches off automatically once the milk temperature reaches 4°C and restarts at 6°C at BMC centre.

KEY WORDS: Quality control practices, BMC (Bulk milk chilling) centers, NDDB (National dairy development board)

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In the dairy industry has been a challenge and a permanent concern. To achieve this, it is essential to obtain good quality milk from primary production and to maintain it until it is processed in the dairy industry by keeping any possible disruption to a minimum. In India milking of animal is done either at community milking

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centre or at the houses of the farmers. In most of the areas milking is done at the farmers home and then delivered to the milk pooling points in the village. From the milk pooling points milk is sent to bulk milk chilling centres. It is very essential to cool the milk immediately after milking to maintain the quality of milk, since pooling from the dairy farmers and transporting in bulk to processing plant may take eight hours from the time of milking. The chilling of milk to about 4°C or less is done to check the growth of bacteria and preserve the quality as produced, until it is subjected to pasteurization process. Chilling not only destroys the bacteria present in the milk but also lowers the growth of bacteria which will otherwise be very rapid at the high ambient temperature. Hence, by considering the above the present study is taken upto compare the quality control practices followed at selected bulk milk chilling centre with NDDB standards.

METHODOLOGY

Farmer Producer Organization (FPO) owned milk Producer Company in South India was selected purposively. The present study was undertaken in Chittoor district of Andhra Pradesh in view of presence of highest milk procuring bulk milk chilling centers in the district. Primary data was collected from the selected BMC centre by using a well-defined schedule through personal interview and observation. A matrix was developed to indicate the quality control practices at BMC centre, which also suggests the standards to be improved in the selected BMC centre of the study area.

ANALYSIS AND DISCUSSION

Table 1 presents the comparison between National Dairy Development Board (NDDB) BMC quality control standards and FPO's BMC in quality control practices revealed that there were no major deviations observed, except that it was observed that delay in opening and closing timings by the in-charge and operator. They were reporting 40 to 50 min delay than the NDDB standards as a result preparation time is reduced hindering the efficiency of milk collection process. As per the NDDB standards auto mode is recommended so that the BMC switches off automatically once the milk temperature reaches 4°C and restarts at 6°C at BMC centre. But it was observed that BMC unit well-being running manually by operator and the switch was being turned off once the BMC milk temperature touches 4°C and starts at 6°C, due to this delay in manual cut off the milk is being crystallized. The observed BMC unit followed all NDDB standards except opening and closing timings for milk collection and in running the BMC unit in auto mode.

Quality control practices followed at Bulk Milk Chilling Centres (BMC):

The quality control practice for Bulk Milk Chilling Centre (BMC) were presented in matrix indicating the effect of practice on overall quality of milk and nature of practice was mandatory to meet the milk standards of NDDB or voluntary in nature. The matrix was developed to improve the standards at BMC further. The matrix was classified into four categories *viz.*, must to have, good to have, optional to have and must not have based on overall effect on milk quality and nature of practices. The overall effect of these quality control practices on milk quality was categorized into two groups *i.e.*, high and low. Quality practices were divided into two groups *i.e.*, voluntary practices and mandatory practices which are used to understand the important factors should be consider.

It was inferred from the above Table 2 that among the above quality control practices under "Must have" indicate all those practices to be followed mandatory at BMC level to meet NDDB standards and have high effect on overall quality of milk. The BMC in the study area was meeting all these must have standards like filtration of milk after receiving the milk cans from each MPP, testing the milk sample from each can, cleaning of cans with surfactants (Potassium hydroxide), proper drying of cans after washing, maintaining the milk temperature at 4°C and usage of cap and gloves by labour. "Must not have" indicate all those practices to be followed mandatory at BMC level to meet NDDB standards and have low effect on overall quality of milk practices. The BMC in study area should follow all these "must not have" practices like preventing milk temperature below 4°C, milk crystallization, unhygienic conditions around BMC, garbage inside the BMC unit and improper ventilation to meet the quality milk standards.

"Good to have" practices are those practices that can be followed voluntarily at BMC level and have high effect on overall quality of milk. Following "Good to have" practices would set new industry standards, achieve high quality milk and lead to control on over all procurement quality control practices. The "good to have" practices identified are cleaning of milk cans with hot water, checking the time of the can arrival and temperature of the can, organoleptic testing of milk from each milk can received, proper handling of milk can, usage of housefly and insect traps, mobile application with Qr code or Bar code for reporting and tracking and surveillance cameras to monitor activities. The "Optional to have" are those practices that can be followed voluntarily at BMC level and have low direct effect on overall quality of milk. Following "Optional to have" practices would lead to setting industry bench mark, highest quality milk and lead to highest control on over all procurement quality control practices. The "Optional to have" practices identified at BMC level are separate space to keep chemicals, live temperature and time tracking, using of IRDF or GPS tags, computerization of the activities.



Sr.	Fable 1: Comparison between National Dairy Development Board (NDDB) standards and in BMC standards in study area Sr. National Dairy Development Board Observed quality practices followed at Deviction Impact of					
Sr. No.	(NDDB) BMC standards	BMC	Deviation	deviation		
Preli	minary activities					
1.	The BMC In-charge and operator should	The BMC In-charge and operator reported	In-charge and operator	Milk quality will		
	report at least one hour before the notified	10 to 20 min earlier than the notified time	reported 40 to 50 min delay in	deteriorate.		
_	time of milk collection.	of milk collection	reporting			
2.	Clean and sanitize all milk collection	All the milk collection accessories are	No deviation observed	-		
	accessories prior to milk collection.	cleaned and sanitized prior to milk collection.				
3.	Ensure that nylon sieve and nylon/ muslin	Clean and undamaged muslin cloth are used	No deviation observed	-		
	cloth used for milk filtration which is clean	for filtration of milk				
	and not damaged.					
	tain good personnel hygiene					
1.	Hand washing on a frequent basis,	Washing their hands on a frequent basis,	No deviation observed	-		
	especially at all times after the employees use the washrooms/toilets and also prior to	especially at all times after the employees use washrooms/toilets and also prior to milk				
	milk collection.	collection.				
2.	Avoid handling milk if there are any open	Staffs avoid milk handling if there are any	No deviation observed	-		
	wounds or sores especially on the hands and	open wounds or sores especially on the				
	arms or if suffering from cough/cold or	hands and arms or if suffering from				
	sneezing. Treat and bandage wounds and	cough/cold or sneezing.				
	sores immediately.					
3.	Hair must be trimmed and kept short, not covering the forehead and not touching the	Women's hair is always tied and use head	No deviation observed	-		
	shirt collar at the back (for men). For	caps.				
	women hair must always be tied.					
Bulk	milk cooler and connected equipment					
1.	Presence of dust, particles, insects,	Operator inspect the BMC tank for proper	No deviation observed	-		
	deposition of milk solids should be	cleanliness and rinse thoroughly with hot				
	removed with necessary cleaning-in-place	water				
2.	(CIP) and thorough rinsing with hot water. Check that milk pump seal is not leaking	Personnel check that milk pump seal is not	No deviation observed			
2.	during operation	leaking during operation.	No deviation observed	-		
3.	Drain water if any, from the BMC.	From the operators drain water if there is	No deviation observed	-		
	-	any.				
	collection activities					
	collection, sampling and testing					
1.	Check the milk for any extraneous material	Personnel check the milk for any extraneous	No deviation observed	-		
	such as dirt, hair, dead flies, straw etc. and educate the producer.	material such as dirt, hair, dead flies, straw etc. and educate the producer				
2.	Advise milk producers to filter milk using a	Personnel advise milk producers to filter	No deviation observed	-		
	clean filter before bringing to collection	milk using a clean filter before bringing to				
	centre.	collection centre.				
3.	Check the milk for presence of adulterants	Personnel perform organo leptic test to the	No deviation observed	-		
	organoleptically and if suspected, keep it	milk in random from milk cans and if				
4.	aside for test. Reject the milk if found adulterated.	suspected, keep it aside for test. Personnel reject the milk if found	No deviation observed			
	Reject the mink in found additerated.	adulterated.	No deviation observed	-		
Post	milk collection activities:					
1.	Check and record the milk temperature	Personnel check and record the milk	No deviation observed	-		
	during storage and fill all the entries in the	temperature during storage and fill all the				
	log book.	entries in the log book.				
2.	In the auto mode, the BMC switches off	Personnel switch off the BMC once the	Deviation was observed as	Due to this		
	automatically once the milk temperature touches 4° C and restarts at 6° C.	milk temperature touches 4° C and restarts at	milk temperature reaching below 4°C due to manual	delay, milk		
	touches 4 C and restarts at 6 C.	6°C.	operation	crystallization will takes place		

	GOOD TO HAVE	MUST HAVE
High milk quality	 Organoleptic testing of milk Time and temperature checking of cans Hot water cleaning of cans Proper can handling Usage of insects traps Mobile application for reporting Surveillance cameras to monitor activities 	 Cans cleaning with surfactants Maintaining milk at 4°C Milk filtration Milk sample testing Proper can drying Usage of cap and gloves by workers
Overall effect on	OPTIONAL TO HAVE 1. Separate space for keeping chemicals 2. Live temperature and time tracking 3. Usage of IRDF or GPS tags 4. Computerization of the activities	MUST NOT HAVE 1. Milk temperature below 4°C 2. Milk crystallization 3. Unhygenic conditions around BMC 4. Garbage inside the BMC unit 5. Improper ventilation

Conclusion:

From the study it can be concluded that the selected BMC centre follows all NDDB standards except opening and closing time for milk collection and in running the BMC centre in auto mode. From the developed matrix the selected BMC centre follows "Must have practices" and "Must not have" practices and it needs to follow "Good to have" and "Optional to have" practices which would set new industry standards and lead to control on overall procurement quality control practices.

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