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**Effect of good sanitation and udder preparation with chlorine solution on subclinical mastitis in Thailand**

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**Abstract**

Smallholder dairy farmers in Chiang Mai Province, Thailand normally do not follow good sanitation in dairy production leading to a prevalence of subclinical mastitis in the dairy herds. This study was carried out to demonstrate to the farmers, advantages of following good sanitation procedures. Forty dairy farms in Chiangmai Province, Thailand, of which the owners had been trained on dairy farming and milking management were divided into 2 groups: good sanitation and poor sanitation. Good sanitation group practised regular use of chlorine before milking and poor sanitation had irregular use of chlorine before milking (42.5 % and 57.5 %, respectively). Farmers in the first group used chlorine solution to clean the cow's udders before milking significantly ( $P < 0.05$ ) more frequently than those in the second group (52.9 % and 21.7 %, respectively). Milk samples ( $n=2908$ ) from 122 dairy cows were collected once a month for 11 months and tested for sub-clinical mastitis using the California Mastitis Test (CMT). Milk samples from the first group showed significantly ( $P < 0.05$ ) lower positive results to CMT than those from the second group (8.25 % and 18.15 %, respectively). However, the percentages of milk samples with positive results were not different between cows on regular chlorine use and those on irregular chlorine use before milking. Good sanitation and regular use of chlorine solution for udder cleaning before milking resulted in the least percentage incidence of milk samples with positive CMT results (7.85 %). The severity of sub-clinical mastitis was also significantly ( $P < 0.05$ ) decreased. Farmers in this region are therefore always recommended to follow good sanitation procedures and use chlorine regularly for udder cleaning to minimise incidence of mastitis in their herds.

**Introduction**

Mastitis is an inflammation of the udder. The disease occurs at different levels of intensity but individual cases can be differed as clinical or subclinical. Subclinical mastitis is important because it is 15 to 40 times more prevalent than the clinical form, usually precedes the clinical form, of long duration, difficult to detect, reduces milk production and adversely affects the quality of the milk (Philpot, 1984). Mastitis is widespread throughout the dairy world. In herd with no effective mastitis control program, about 30% of cows will be infected in an average of one quarters each. Moreover, 50% of cows will be infected with some form of mastitis in at least one quarter for about 50% of their milking life. The cow shares her environment with a multitude of

microorganisms and it is inevitable that some will find their ways into the udder and cause mastitis. The best way to prevent mastitis is by maintaining a clean environment, practicing good hygiene at milking and using functionally adequate milking machine (Wilson, 1982; Gill and Robertson 1984; Philpot, 1984).

### Methods

1. Trained the dairy farmers for dairy farming, sanitation and milking management.
2. Visited forty dairy farms in Chiang Mai province, Thailand and divided into 2 groups, good and poor sanitation and milking management. Recorded chlorine solution using to clean cow's udder before milking or without chlorine using in each group.
3. Tested for subclinical mastitis each cow's udder by California Mastitis Test (C.M.T.) once a month for 11 months period. (2908 milk samples from 122 dairy cows).
4. Compared percentage of milk samples with positive result to C.M.T. in each group by Chi-square analysis (Snedecor and Cochran, 1980).

### Present situation

Percentage of good sanitation and milking management dairy farms in Chiang Mai province, Thailand were less than poor sanitation and milking management dairy farms. (42.5% and 57.5% respectively). Farmers in the first group more frequently used chlorine solution to clean cow's udder before milking than those of the second group. (52.9% and 21.7% respectively) ( $p < 0.05$ , Table 1)

**Table 1.** Percentage of dairy farms with good or poor sanitation and milking management, with or without the use of chlorine solution to clean cow's udder before milking.

Group	Sanitation and milking management			Use of chlorine		No use of chlorine	
	Quality	Farm	Percent	Farm	Percent	Farm	Percent
1	Good	17	42.5	9	52.9*	8	47.1
2	Poor	23	57.5	5	21.7*	18	78.3
Total		40	100.0	14	35.0	26	65.0

\* significant at  $P < 0.05$

**Table 2.** Percentage of milk samples with positive result to C.M.T. in dairy farms with or without using chlorine solution to clean cow's udder before milking in good and poor sanitation and milking management

Group	Chlorine solution		Total
	Using	Without using	
	Milk sample with positive result to C.M.T./Total milk sample (%)		
1. good sanitation and milking management	59/752 (7.9)	46/520 (8.9)	105/1272 (8.3)*
2. poor sanitation and milking management	59/352 (16.8)	238/1284 (18.5)	297/1636 (18.2)*
Total	118/1104 (10.7)	284/1804 (15.7)	402/2908 (13.8%)

\* significant at  $P < 0.05$

Percentage of milk samples from good sanitation and milking management dairy farms showed positive result to C.M.T. lower than those from poor sanitation and milking management dairy farms significantly (8.3% and 18.2% respectively,  $P < 0.05$ ).

However, percentage of milk samples with positive result were not different between cow's with chlorine using and without chlorine using in each group, but the result showed that good sanitation and using chlorine solution for udder cleaning before milking caused the lowest percentage of milk sample with positive result to C.M.T. (7.9%) (Table 2) and the severity of subclinical mastitis was decreased ( $P < 0.05$ ) (Table 3)

**Table 3.** Percentage of milk samples with positive result to +, ++ or +++ C.M.T. scores in dairy farms with or without using chlorine solution to clean cow's udder before milking in good and poor sanitation and milking management.

Group	Chlorine solution					
	Using			Without using		
	C.M.T Score					
	+	++	+++	+	++	+++
1	56/752 (7.5)	3/752 (0.04)	0/752 (0)	32/520 (6.2)	13/520 (2.5)	1/520 (0.2)
2	47/352 (13.4)	12/352 (3.4)	0/352 (0)	186/1284 (14.5)	47/1284 (3.7)	5/1284 (0.4)
Total	103/1104 (9.3)	15/1104 (1.4)	0/1104 (0)	218/1804 (12.1)	60/1804 (3.3)	6/1804 (0.3)

Remark 1 = good sanitation and milking management  
2 = poor sanitation and milking management

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