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EFFICIENCY OF PREMILKING UDDER PREPARATION ON THE HYGIENIC QUALITY OF MILK

(With 3 Tables)

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كفاءة تجهيز الضرع قبل الحلب على النوعية الصحية للبن

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لما كانت نظافة الضرع والحلمات وتطهيرها لها الدور الأكبر فى انتاج لبن عالى الجودة خالى من الميكروبات قدر الامكان ، كان من الضرورى اجراء هذه الدراسه للتوصل الى الطريقه المثلى لتطهير الضرع قبل الحلب .

اشتملت هذه الدراسه على عدد ٢٢ بقرة حلابه خاليه من التهاب الضرع الظاهرى والخفى واجريت تجربته على عدد ١١ بقرة بينما استخدمت الأبقار الباقية كاختبار .
وقد أخذت مسحات من دائره قطرها $\frac{1}{4}$ سم حول فتحة الحلمه ثلاث مرات الاولى قبل اجراء أى غسيل أو تطهير للحلمات ، والثانيه بعد غسيل الحلمات بماء نظيف وتجفيفها بمناديل ورقيه مصاصه ، والثالثه بعد غسيل الحلمات بالماء وتجفيفها ثم تغطيسها فى محلول الايودفور ٥ ٠٠ % وتجفيفها مره اخرى بالمناديل الماصه . وكذلك قد تم استبعاد أول القطرات من اللبن قبل الحلب فى أنابيب اختبار معقمه ثم حلبت الأبقار منفصله بعد وقبل التطهير .

وقد دلت النتائج أن غسل الحلمات بماء نظيف وتجفيفها بمناديل ماصه أدى الى تقليل العدد الكلى للميكروبات والميكروبات القولونيه العضويه والميكروبات القولونيه السببيه بنسب ٨ % ، ٤٤ % ، ٩٠ % ، ٩٠ % ، ٩٧ % على التوالي بينما أدى غسل الحلمات بماء نظيف وتجفيفها ثم تغطيسها فى محلول الايودفور ٥ ٠٠ % وتجفيفها الى تقليل نفس الأنواع من الميكروبات بنسب ٧٠ % ، ٩٠ % ، ٦٨ % ، ٥٠ % ، ٩٨ % على التوالي .

وكذلك تم مناقشة أهميه الميكروبات المعزوله من الناحيه الصحيه والانتاجيه وكذلك التوصيات الواجب مراعاتها نحو تطهير الضرع قبل الحلب وأثناء انتاج اللبن وتداوله .

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SUMMARY

Twenty two cows were used for studying the efficiency of premilking udder preparation on the hygienic quality of milk. Eleven cows served as control, the remaining (11 cows) were subjected to different treatments prior to milking. Swabs were taken around teat orifice before any preparation (SB), after washing udder with water (SAW), and after washing with water & dipping in iodophor 0.5% (SAWI). Moreover, samples of foremilk (FM), quarter milk samples after all preparations and rejection of foremilk (QMAT) as well as control milk sample (CM) were collected & examined bacteriologically. SAW decreased the mean value of total colony, coliform & enterococci counts by 44.8%, 42.9% and 97.9% around the teat orifice respectively. The reduction percent values for SAWI were 70.1%, 68.9% and 98.5% and for QMAT were 80%, 72% and 98% respectively. So, premilking udder preparation by washing the udder with running water, drying, followed by dipping in iodophor 0.5% accompanied with rejection of foremilk is of great value in producing a clean milk with low bacterial content and consequently a good quality milk.

Keywords: Efficiency, premilking, udder preparation, hygienic quality milk.

INTRODUCTION

It is known that the initial microflora of milk has a marked influence on the keeping quality of raw milk. Once the milk comes outside the udder, contamination of various degrees occur due to normal handling procedures. Moreover, Between milkings the teats may become soiled with dung, mud and bedding material such as straw, saw dust, wood shaving or sand. These dirt on teats together with large number of microorganisms associated with them are washed into milk during milking. Numbers and types of microorganisms vary according to the type and amount of soil on the teats (GIERL and PUTZ, 1992).

The production of good quality milk requires healthy cows which are the results of many management factors including mastitis control and herd health program (BODMAN et al., 1988).

Good quality starts on the farm by using premilking udder disinfectants to minimize the population of organisms on teats

and udder, while post milking teat dipping safeguard against new intramammary infection (IMI).

Premilking udder preparation by teat washing and drying prior to milking significantly lowers the bacterial counts in milk and on teats (MCKINNON *et al.*, 1990 and RASMUSSEN *et al.*, 1991). The most important aspect of premilking hygiene is dryness of the udder at time of cluster attachment (INGAWA *et al.*, 1992). Moreover, teat dipping prior to milking (predip) using iodophor 0.5-1.0% was effective in reducing the incidence of IMI caused by environmental pathogens (PANKEY *et al.*, 1987; GALTON *et al.*, 1988; NICKERSON, 1989; INGAA *et al.*, 1992 and SEARS *et al.*, 1992).

Therefore, this work was planned to study the effect of different methods of udder preparation on the bacterial content of produced milk.

MATERIALS AND METHODS

Twenty two cows (eleven as a control) free from IMI were selected, for studying the efficiency of premilking udder preparation on the quality of milk, by application of chloride qualitative test according to ATHERTON and NEWLANDER (1977).

Five samples from each cow were taken as follows:

- 1 - Swabbing the right front teat before any preparation.
- 2 - Washing of teat with running water, drying with individual paper towel and swabbing of the teat.
- 3 - Washing the teat with running water, then dipping in iodophor 0.5% and drying with individual paper towel. Teat end swabs were taken according to INGAWA *et al.* (1992).
- 4 - Foremilk samples (BRAMLEY, 1981).
- 5 - Quarter milk sample from the udder after the previous preparations (BODDIE and NICKERSON, 1992).
- 6 - Control milk samples from cows without any preparation.

Both the teat end swabs and the collected milk samples were subjected to bacteriological examination by determining the total colony count (A.P.H.A., 1985), coliform count (MPN/ml) (THATCHER and CLARK, 1978) and enterococci count using ESE (EFTHYMIU *et al.*, 1974).

RESULTS

Are Presented in Tables 1-3.

DISCUSSION

Results presented in Table (1) revealed that, the mean total colony counts/ml for SB, SAW, SAWI, FM, QMAT and CM were 8.7×10^6 , 4.8×10^6 , 2.6×10^6 , 5.7×10^6 , 1.7×10^6 and 8.5×10^6 , respectively.

The corresponding values of coliform count (MPN/ml) were 7.14×10^2 , 4.08×10^2 , 2.22×10^2 , 6.43×10^2 , 2.38×10^2 and 8.51×10^2 , respectively. While, the values of enterococci count/ml were 2.03×10^2 , 0.04×10^2 , 0.03×10^2 , 1.07×10^2 , 0.05×10^2 and 2.53×10^2 , respectively.

Washing the udder with water and drying decreased the total colony, coliform enterococci counts on teat orifice by 44.8%, 42.9% and 97.9%, respectively, while washing with water and drying followed by iodophor dipping 0.5% and drying decreased the same counts by 70.1%, 68.9% and 98.5%, respectively (Table 2).

Moreover, the reduction of the total colony, coliform and enterococci counts in QMAT was 80%, 72% and 98%, respectively (Table 3). These results agreed with *PATEL et al.* (1993) who concluded that the first five streams of milk must be excluded.

Coliforms are responsible for spoilage of milk and its products which include acid production, sliminess, ropiness, bitter flavour "grassy unclean, faecal odour as well as rancid and soapy flavour" (STEAD, 1986). The presence of enterococci in milk could serve as an indication of the unsanitary production and handling of milk. They are also associated with some cases of food poisoning outbreaks (*SEDOVA et al.*, 1981).

Milk quality and mammary health can be affected by premilking udder hygiene, so effective udder hygiene is essential for reducing bacterial numbers on the teat skin by application of the different methods of udder preparations before milking to produce milk of good quality.

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Table (1):

Statistical analysis results of the mean total colony, coliform and enterococci counts/ml milk of experimental animals

Variable	NO. of Samples	Mean count/ml		
		Total colony	coliform	Enterococci
(1) SB	11	5.7×10^6	7.14×10^2	2.03×10^2
(2) SAW	11	4.8×10^6	4.08×10^2	0.04×10^2
(3) SAWI	11	2.6×10^6	2.22×10^2	0.03×10^2
(4) FM	11	5.7×10^6	6.43×10^2	1.07×10^2
(5) QMAT	11	1.7×10^6	2.36×10^2	0.05×10^2
(6) CM	11	8.5×10^6	6.51×10^2	2.53×10^2

SB = Swab before any preparation

SAW = Swab after washing udder with water

SAWI = Swab after washing and teat dipping in iodopher 0.5%

FM = Fore milk

QMAT = Quarter milk after treatment prior milking

CM = Control milk

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Table (2):

Reduction percentage of premilking udder preparations
on teat orifice

Udder preparations Counts	Control SB	SAW		SAWI	
		Counts	%	Counts	%
Total bacterial	8.7×10^6	4.8×10^6	44.8	2.6×10^6	70.1
Coliform	7.14×10^2	4.08×10^2	42.9	2.22×10^2	68.9
Enterococci	1.03×10^2	0.04×10^2	97.9	0.03×10^2	98.5

Table (3):

Reduction percentage of premilking udder preparations
on quarter milk samples.

Udder preparations Counts	Control Milk	SAWI	
		Counts	%
Total bacterial	8.5×10^6	1.7×10^6	80
Coliform	8.51×10^2	2.38×10^2	72
Enterococci	2.53×10^2	0.05×10^2	98