Effect Of Drying- Off Period And Teat Dipping On Productivity Of Dairy Cows

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ABSTRACT

This study was conducted to investigate effect of period of drying off and teat dipping on dairy cow production. This study was carried out at Sami Asaad Dairy Farm at Abo-Hamad city in Sharkia Province in the period from first of December, 2010 till end of November, 2011.

The data were obtained from farm book record and were collected from one hundred dairy cows (Holstein Friesian) to assess the effect of length of dry off period, age and lactation season on dairy cow production. The obtained results showed that the cows with a dry period of 45, 46 and 59 days, had the highest milk yield at 305-day. So, increasing the dry period lead to an increase in milk yield of subsequent lactation. Furthermore, the total milk production was increased gradually from 3 to 7 years, after that it decreased. Also to evaluate the effect of teat dipping on dairy cow's milk production in the period from first of July till end of September, 2011; the data obtained from sixteen dairy cows (Holstein Frisian), divided into 2 groups, group A (n= 8) where the udder washed, dried with a clean toilet tissues and the teats dipped in 70% ethyl alcohol solution, while group B (n=8) without teat dipping. The results revealed that the teat dipping after milking decrease the incidence of mastitis and increase milk yield. In conclusion, length of dry off period, age, lactation season and teat dipping have significantly effect on milk yield in dairy cows.

INTRODUCTION

The main purpose of dairy breed of cattle is to produce milk, and reproduction to provide replacement cows for the future, and most of all to provide a means of living for farmers in the dairy business by providing the highest milk yield at the least possible cost. The Holstein breed is known for its high average milk production *(1)*.

Milk and milk production constituted about 75% from the total income obtained from animal products in Egypt *(2, 3)*. Also, it plays a great role in human supplementation with a high amount of daily protein intake. So, the dairy industry plays a great role in solving the human nutritional problems in Egypt *(4)*.

Dairy cows require a rest period between lactations, due to the udder and the digestive tract are benefit during this period *(5)*. The dry period between successive lactations is crucial for regeneration of productive function of mammary tissue, and preparation for high production in the subsequent lactation *(6)* . The dry period is actually the beginning of the next lactation and it is the best time to institute management practices to prevent health problems and to ensure good production in the lactation to follow. This Fact sheet describes practices which aimed to promote good health and performance in early lactation cows *(7)*.

A number of factors have been reported to affect milk production in the tropics. These include genetic, climatic, disease, feeding, year of calving and managerial factors *(8, 9)*. Animal factors such as breed, age, stage of

lactation, parity and even milking frequency, have also been reported in other studies to affect milk production *(10, 11)*.

Most milk producers understand that milk production fluctuates from one lactation to the next. A lactation curve depicts a cow's milk yield after colostrums to drying off *(12)*.

Management is one of the most important factors of economic resources that determine the efficiency of animal production farms *(13, 14)*. Where, reducing milk production is the major cost associated with subclinical mastitis and a substantial cost associated with clinical mastitis *(15)*. Mastitis is one of the most costly problems in the dairy industry and defined as udder inflammation characterized by visible abnormalities in the milk or the udder or both. Severity of clinical mastitis cases can be described as mild, moderate or severe *(16)*. Mastitis-related losses are associated with reduction in yield, increased treatment costs, discarded milk, increase in culling and associated dairy cow replacement rates, and financial penalties for exceeding legal milk quality limits *(17-20)*. The risk factors associated with clinical or subclinical mastitis include poor farm management practices, large herd size, inadequate teat and udder hygiene *(21)*, unhygienic housing and milking parlor practices *(22)*. The aim of this study was to determine the effect of management practices (teat dipping) after milking on milk production and incidence of mastitis, also to study the effect of drying off period and age on milk production.

MATERIAL AND METHODS

This study was carried out at Sami Asaad dairy farm at Abo-Hamad city in Sharkia Province. At the beginning of the study, a total one hundred apparently healthy dairy cows, marked by applying an ear tag. The open yard was enriched with forced ventilation system by electric fans. Dairy cows were fed *ad libitum* by a total mixed diet that had been formulated to meet the nutritional requirement *(23)*.

The ingredients and requirement for one cow

Ingredient of ration	At lactation season	At drying off period
Barseem	12 kg	8 kg
Silage	20 kg	8 kg
Soya bean	6 kg	0.5 kg
Maize	5 kg	1.5 kg
Bran	2 kg	0
Calcium	200 gm	100 gm
Na bicarbonate	250 gm	125 gm
Phosphorus	80 gm	60 gm

The dairy cows were milked three times per day, first one at 7 am – the second at 2 pm and the third at 6 pm in ventilated and herringbone milking parlor. Milking parlor was provided with electronic digital display, recording the milked cow's number and milk production in each milking.

Then, a total of sixteen Holstein Frisian dairy cows were kept in open yard in the period from first of July till end of September, 2011 where its handling and management were as mentioned in experiment one. Dairy cows were divided into 2 groups, group A (n= 8) where the udder was washed using a manual water source under pressure and dried with a clean toilet paper, furthermore the foremilk

stripping from the 4 quarters was discarded. After that, the teat end and its orifice were sanitized with ethyl alcohol 70% *(24)*. Group B (n=8) were without teat dipping. The milking procedures were as mentioned in experiment one with analysis the milk by California mastitis test (CMT) *(25)*, the test is carried by mixing an equal volume of milk with a 1:1000 dilution of 3% sodium lauryl sulphate and bromocresol (DeLaval, Cardiff, UK). Each quarter milk sample from the cow was placed in one clean well of a black plastic test paddle divided into four separate wells, one for each quarter sample. As the plate was rotated gently, any colour changes or formation of a viscous gel were interpreted by the authors above: in brief, scores were given within the range 0–4, with 0 for no reaction, 1 for a trace, 2 a weak positive, 3 a distinct positive and 4 a strong positive. The milk yields were calculated for determining the effects of teat dipping.

Statistical analysis

Data was collected, arranged, summarized and then analysed using the computer program statistical package for social science *(26)*. The statistical methods were one way ANOVA comparison between groups (t-test) and Pearson correlation coefficient.

RESULTS

Fig. 1a. Total milk production of dairy cows in relation to length of dry off period

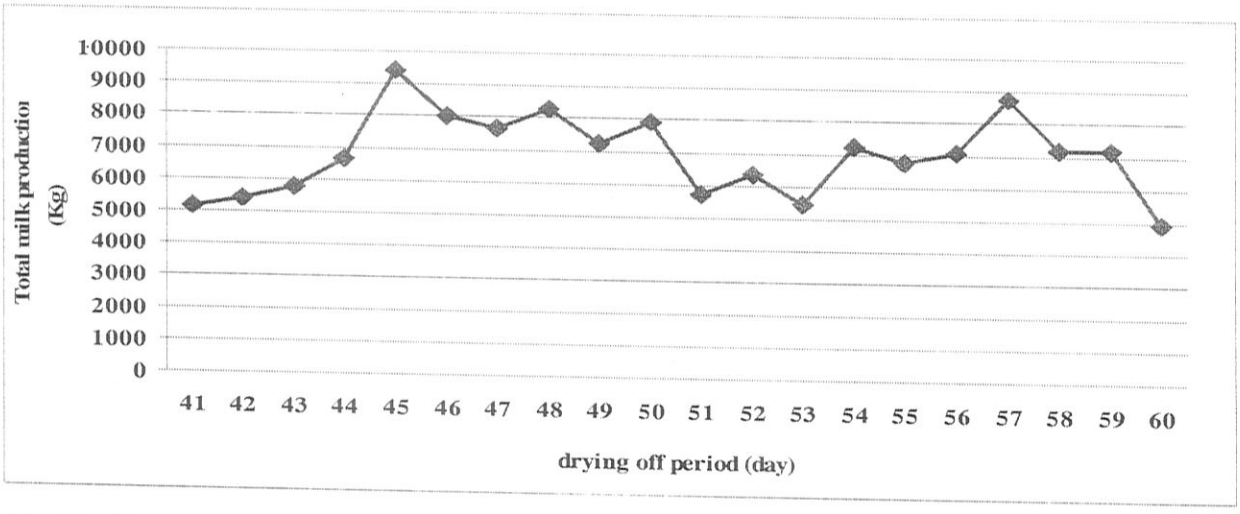


Fig. 1b. Total milk production of dairy cows in relation to age

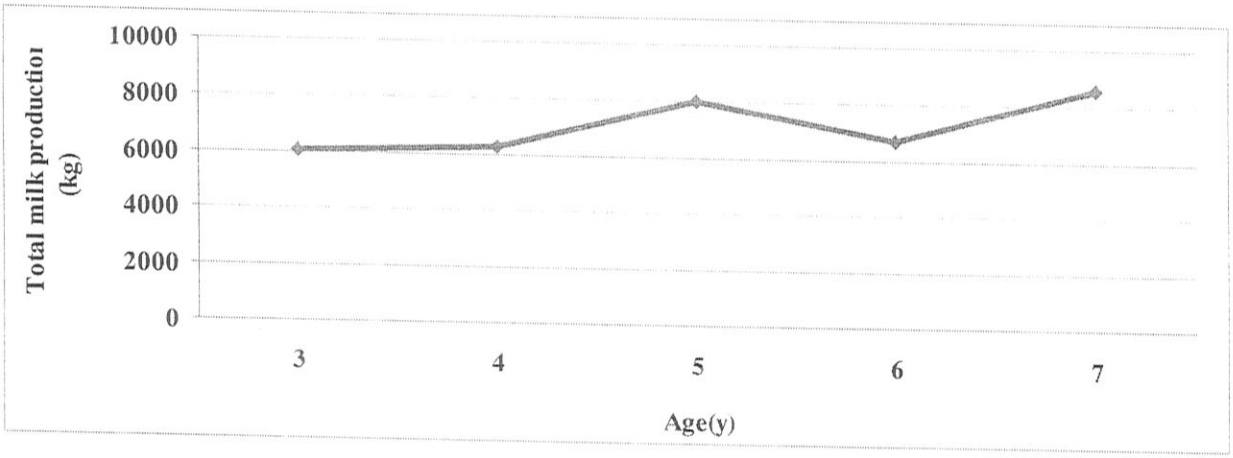


Table 1. Correlation coefficient among the length of drying- off period, age of the cow and total milk yield

		Length of Dry off period	Age
Total milk production	Pearson Correlation	0.049	-0.011
	Sig. (2-tailed)	0.624	0.911
	N	100	100

N: the number of cow records.

Table 2. The mean value (± SE) of daily milk production in dairy cows in relation to teat dipping

	Milk production (kg / day)
With Teat dipping	29.2181 ± 0.14
Without teat dipping	27.0450 ± 1.41

Fig. 2a. Daily milk production of dairy cows in relation to teat dipping

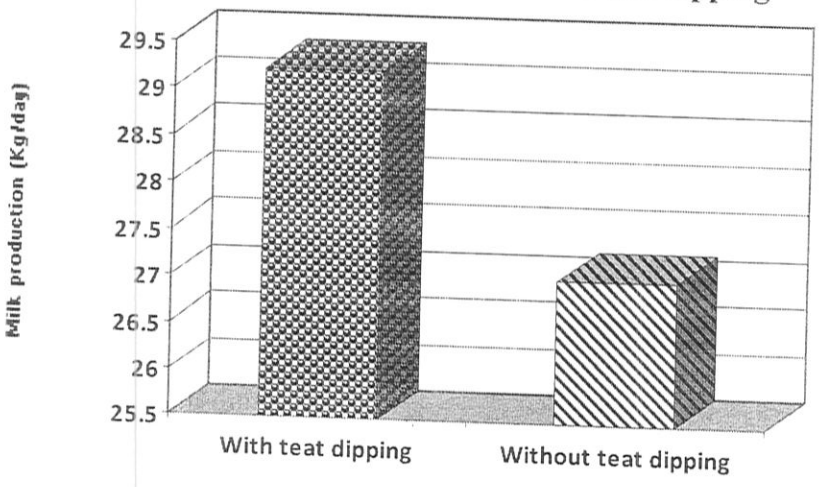
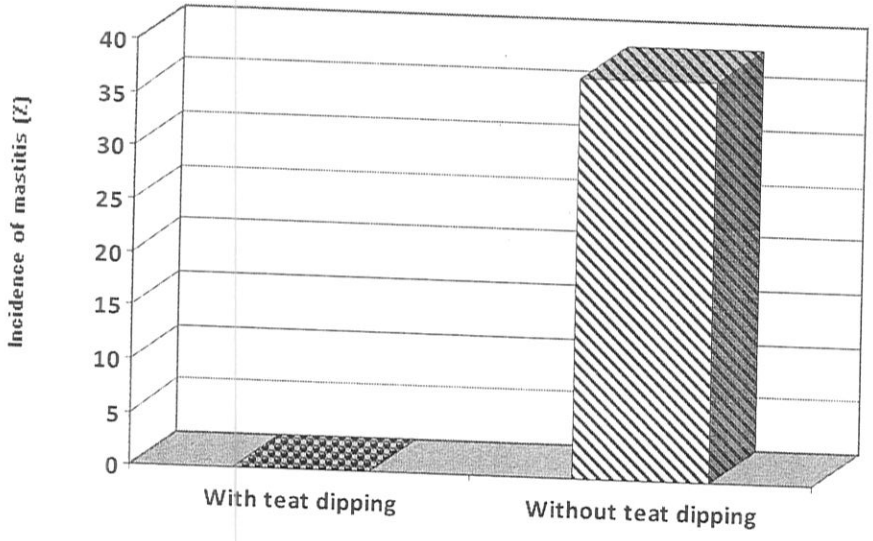


Fig. b. Incidence of subclinical mastitis in dairy cows in relation to teat dipping



DISCUSSION

The results in Table 1 and Fig. 1a indicate the effect of length of dry off period on milk production of dairy cows. The obtained results indicate that cows with dry period of 45, 46 and 57 days achieved the maximum milk yield (9405.00 ± 1835.00, 8045.00 ± 1415.00 and 8728.57 ± 911.19, respectively), while at 60 days, the milk yield was 4930.00±733.24. The dry period longer than 60 days in length does not result in a significant increase in milk production *(27)*. Long dry periods decrease the average annual production of the cow by extending the calving interval beyond the normal 13-14 month interval and causing decrease in the lifetime production of the dairy cow, and the part of the dry period effect is related to body condition of the cow at calving. Cows in good body condition at calving produce higher in milk yield during the following lactation than in cows in thin body condition at calving. Several previous studies *(28 - 30)* showed the same results.

Concerning the effect of age of dairy cows on milk production Table 1 & Fig. 1b, the obtained results indicate that the milk yield (kg) affected by age of dairy cows, where the maximum milk production from 3 to 7 years was as following: 6071.66±581.61, 6284.52 ± 265.21, 7972.58±356.56, 6681.53±545.63 and 8570.00±1260.80, respectively. The amount of milk produced by the cow increases with advancing lactations (age) *(27)*. These results may be due to an increase in body weight, which results in a larger digestive system and a larger mammary gland for the secretion of milk. Furthermore, another reason for increased milk production with age is due to the effects of recurring pregnancies and lactations, which disagree with the study which showed that the older age may contribute to reduce milk production through turnover rate of secretory cells *(11)*.

The results in Table 2 & Fig. 2a, b revealed that the teat dipping in dairy cows have significance difference on milk production, where the cows with teat dipping produce milk production (29.2181 ± 0.14) more than cows without teat dipping (27.0450 ± 1.41). These results were similar to that which showed that pre-milking udder hygiene and teat dipping are aimed for reducing infections for udder. Moreover, mastitis remains a disease causing losses to dairy farm as decreased milk production *(15, 32 , 33)*.

CONCLUSSION

From above mentioned results, there are some factors as length of drying off period and age and other managerial factors as teat dipping which had effects on milk yield of dairy cows, as the length of dry off period had a significant impact on milk yield. Moreover, the age and lactation season of animal have also significant effects on milk production. So it is advisable to give good hygienic measures for udder before and after milking to minimize the incidence of health management problems as mastitis.

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الملخص العربي

تأثير فترة الجفاف وتغطيس الحلمات على إنتاجية الأبقار الحلوب

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كان الهدف من هذه الدراسة هو دراسة تأثير فترة الجفاف وتغطيس الحلمات على انتاج الالبان فى الابقار الحلابة و تم اجراء هذه الدراسة في مزرعة للبقر الحلوب في مدينة ابو حماد بمحافظة الشرقية. تم الحصول على البيانات من ١٠٠بقرة حلوب من نوع الفريزين لدراسة أثرطول فترة التجفيف و عمر الحيوان و موسم الحليب على إنتاجية البقرالحلاب وأظهرت النتائج أن:

الابقار التى تم تجفيفها من (٤١- ٥٩ يوما) كانت أعلى إنتاجية ومن ثم زيادة فترة التجفيف سيؤدى الى زيادة فى انتاج الحليب فى الموسم الاحق بالاضافة الى ان هناك زيادة فى إنتاج اللبن خلال الفترة من ٣ الى ٧ سنوات من عمر الحيوان. وكذلك تم تقييم آثار تغطيس حلمات الضرع على انتاج اللبن فى الابقار، حيث تم ملاحظة ستة عشر بقرة من بداية شهر يوليو حتى نهاية شهر سبتمبرتم تقسيمها إلى مجموعتين المجموعة الأولى (ثمانية بقرات) حيث تم تغطيس الحلمات فى الكحول الايثيلى ٧٠% في حين المجموعة الثانية (ثمانية بقرات) لم يتم تغطيسها. وجد ان المجموعة التى تم تغطيسها لم يحدث لها التهاب الضرع وعلاوة على ذلك زيادة فى إنتاج الحليب. وفي الختام خلال الدراسة وجد أن زيادة فترة تجفيف الضرع و تغطيس حلمات الضرع في رعاية الابقار الحلابة لها آثار ايجابية على إنتاج الحليب وعلى تقليل التعرض لالتهاب الضرع.