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MILKING TIME AND INITIAL MILK YIELD IN BUFFALOES' EGYPTIAN CATTLE AND FRIESIAN CATTLE

By

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This investigation was carried out on a total number of 45 buffaloes, 38 Egyptian cows and 26 Friesian cows. The buffaloes and native cows were kept on the Animal Research Farm of Faculty of Agriculture, Cairo University, while the Friesians were raised on the Tahreer Province Farm. The aim of the work was the study the milking time and the first minute yield (Initial Yield) of milk.

The results could be summarised in the following points:

The mean period of time spent in the morning milking was 5.6, 3.4 and 3.4 min. in buffaloes, Egyptian cattle and Friesians, respectively compared to 3.5, 2.9 and 2.4 minutes in the evening milings.

The time spent in stripping in the morning was 3.1, 2.9 and 3.0 minutes in buffaloes, Egyptian cattle and Friesians respectively compared to 1.6, 1.5 and 2.5 minutes in the evening milkings.

The stripping time was considerably great at the begining of the lactation then decreased gradually to the end of the season.

The collected milk yield from the first minute milking of the quarters represented as a percentage value of the total yield in the morning and evening milking was 11.5 ; 17.5 in buffaloes, 16.1, 14.' in Egyptian cattle and 11.7, 130% in Freisian cows.

A positive significant correlation was found between the total yield and the first minute yield, the coefficients being 0.755 & 0.877 in Buffaloes and 0.849 and 0.881 in Egyptian cows at morning and evening milkings, respectively.

The time spent in milking animals if unduely lengthened could be a serious source of loss of both time and money. Whether animals are milked by hand or machine this point is still of interest to the herd manger. Although many investigators have studied this subject abroad yet very little or practically none is known about the buffaloes and native cattle.

Elting and La Master (1936) reported that the milking time for cows was 5.32 minutes, on the average. Matthews *et al.* (1941), showed that the milking times were 7.24, 8.85 and 8.55 minutes for Greade and Registered Holsteins and Jersy cows, respectively, with a mean of 8.2 minutes. Dalberg (1943) showed that the milking time varied from one milking to the next, the range being 3 to 18 minutes, he concluded that slow or rapid milking is developed

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by habits Sheldon (1944) demonstrated the wide variation in milking time by machine from farm to farm, being from less than 5 minutes to more than minutes, with an average of 6.5 minutes. In hand milking, the time ranged from 4.2 to 8,9 minutes per cow, with an average of 6.8 minutes. Thomas & Anantakrishman (1949) described the milking characteristics of water buffaloes of India and found that the machine milking time averaged 6.0 minutes. Matthews et al(1941) found that the stripping time was on the average 1,42 minutes. Sheldon (1944) found it 1.6 minutes and the proportion of stripping to milking time was only 23.5 percent Sheldon (1944) found that the average of the weight of stripping yield varied from less than 0.7 poind to 1.7 pounds or more per cow, with an average of 1.2 pounds, Korkman (1948) found it 0.4 to 0.9 pounds with a total yield of milk from 5.14 to 5.70 pounds. Matthews *et al.* (1941) showed that high milk yields, from separate quarters also required longer time. However, Andreae (1954) showed a slight variation in milking time between quarters of the udder on the other hand Helmstatt (1955) found that the milking time for separate quarters varied from 2.46 to 12.31 minutes. Cherkash (1957) reported a difference of 5.5 minutes between fore and hind quarter's milking time. Helmstatt (1955) showed a direct relation between milk yield and milking. Eisenreich (1950) stated that there was some relation between milking time and milk yield in slow milking cows, but in quick milking ones, the time remained nearly constant throughout the lactation.

The aim of the present work was to give the basic informations about the milking time and the initial milk yield in buffaloes, Egyptian cows and Friesian cows. These informations are of great value in consideration with milk reduction, milking behaviour of the animals and the practice of milking in the farm.

Moterial and Methods

1. *Milking times*:

A total number of 19 buffaloes, 12 Egyptian cows and 26 friesian cows was used in this study. With the exception of Friesian cows which belonged to the Tahreer province, all the animals were kept on the Research Farm of the Animal Breeding Department, Faculty of Agriculture, Cairo University. The milking times were recorded 2 days a week at morning and evening milkings throughout the lactation season of each individual. The milking time of each quarter was divided into two periods: The first period was the time of milk flow by the usual hand milking, the second period was the stripping time. The quarters were milked according to the following order, right fore, right rear, left fore and left rear successively. Yield and times for each quarter of the udder were recorded for each period.

2. *Initial Yield*:

Twenty six animals of each of buffaloes, Egyptian cows and Friesian cows were used in this study, the data were recorded three days a week for fourteen weeks. The milk production after the first minute of milking each quarter was laken as the initial milk yield. The quarters were milked separately in rotation for one minute each after which the milking was completed by the usual method.

1.—*Milking times*:

The average milking time during the first period and stripping was higher in buffaloes than in Egyptian and Friesian cows (Table 1) - the times were higher at morning than at afternoon milkings. The relative short time of milking in Egyptian cows than that in buffaloes may be due to the low yield in cows

TABLE 1.—TIME OF MILKING IN BUFFALOES AND CATTLE

Month of Lacation	Morning Milking			Evening Milking		
	Total	1st Period	Stripping	Total	1st Period	Stripping
Buffaloes:						
1st lactation . .	8.6	3.0	5.6	5.0	2.4	2.6
2nd „ . . .	10.8	3.1	7.5	5.1	3.1	2.0
3rd „ . . .	9.6	4.0	5.6	6.1	4.0	2.0
4th „ . . .	8.8	6.6	2.2	5.7	4.2	1.5
5th „ . . .	9.4	7.8	1.6	5.4	4.0	1.4
6th „ . . .	8.2	6.6	1.6	4.5	3.5	1.0
7th „ . . .	7.3	5.6	1.7	3.8	7.7	1.1
8th „ . . .	7.9	6.2	1.7	4.5	3.3	1.2
9th „ . . .	9.8	7.8	2.0	5.2	3.3	1.4
10th „ . . .	6.8	5.4	1.4	5.2	4.0	1.2
Mean	8.7	5.6	3.1	5.1	3.5	1.6
Egyptian Cattle:						
1st lactation. . .	7.6	3.3	4.3	5.0	3.3	1.7
2nd „ . . .	6.8	3.3	3.5	4.9	3.1	1.8
3rd „ . . .	7.5	3.3	4.2	5.4	3.6	1.8
4th „ . . .	6.6	4.2	2.5	4.0	3.0	1.0
5th „ . . .	4.3	2.5	1.8	3.3	1.9	1.4
6th „ . . .	5.3	3.9	1.4	3.9	2.5	1.4
Mean	6.3	3.4	2.9	4.4	2.9	1.5
Friesian:						
Mean	6.4	3.4	3.0	4.6	2.4	2.2

in the case of Friesian cows the short time, despite of their higher yield may be due to the faster rate of milk flow. Dahlberg (1943) stated that not all cows can be milked rapidly, this is especially noticeable in hand milking in which the milker sqeezes just hard enough to remove the milk. On the other hand, in machine milking, the suction is great enough to milk the hard milkers as fast as the easy ones. The acquiring of uniform, rapid milking is associated with regularity in all born paractices. The cows should to be milked in the same order at the same time, each day, with a skillful and a reasonably good hand milker since the expulsion reflex is essential to good milking practices. Pfutz and Thomas (1949) found that the cows milked rapidly by hand, yielded singificantly more milk than when they were milked by a slow milker.

The total milking time and the two period times were longer during the first three months of lactation in buffaloes and cattle (Table 1). The mean values of stripping at A.M. and P.M. milkings were 3.1 and 1.6 minutes for buffaloes, 2.9 and 1.5 min. for Egyptian cows, 3.0 and 2.2 min. for Friesian cows, respectively (Table 1). The relative value of stripping time to total milking time was lower in buffaloes than in Egyptian cows followed by Friesian cows, and were lower at evening than at morning milkings, being 35.8 & 31.4% at A.M. & P.M., respectively in buffaloes, 450 & 341% in Egyptian cows and 51.8 & 478% in Friesian cows. Sheldon (1944) showed a lower stripping time, which was 1.6 minutes per cow, and the proportion of stripping times to the total time was only 23.5 per cent. He concluded that the stripping was greater in hers milked slowly bey machine than those milked more quickly.

The milking time of the fore quarters was lower than that of the rear quarters at morning and at afternoon milkings. The proportionality of the milking time of the fore quarters and also of the rear quarters to the total udder milking time was fairly constant at morning and afternoon milkings in the three breeds studied (Table 2). The proportions of the fore quarters milk-

TABLE 2.—MILKING TIME OF THE UDDER QUARTERS AND ITS PERCENTAGE TO THE TOTAL TIME IN BUFFALOES AND EGYPTIAN COWS.

Quarters	Morning milking						Evening Milking					
	Time (min.)				% to total		Time (min.)				% to total	
	Fore		Rear		Fore	Rear	Fore		Rear		Fore	Rear
	R.*	L.*	R.	L.	—	—	R.	L.	R.	L.	—	—
Buffaloes	1.8	1.8	2.6	2.5	41.0	59.0	1.1	1.0	1.5	1.5	42.0	58.0
Egyptian cows	1.6	1.3	1.8	1.7	46.0	54.0	1.1	1.0	1.3	1.2	45.5	54.5

* R. = Right L. = Left

ing time were lower in buffaloes than in Egyptian cows. This may be due to the lower relative milk yield of the fore quarters of the buffaloes than of the Egyptian cows, and also due to the faster rates of the rear quarters.

Matthews *et al.* (1941) showed that the average length of milking time was 3.5 min. for the fore quarter and 4.23 minutes for the rear quarters of the fore quarters and 2.43 minutes for the rear quarters of the udder. The milking time of the whole udder was 8.29 minutes of which 0.55 minutes was devoted to stripping. Andreae (1959) showed a slightly variation in milking time between quarters and 26.1 per cent of the udders studied showed a difference up to 1.75 minutes between quarters, this was usually related to the yield difference between quarters. Helmstatt (1953) showed that the milking time per quarter was 2.46-12.31 min. in normal udders and 1.68-14.42 min. in deformed udders. The difference between the quickast and the, slowest quarters was 0.56 - 6.09 min. and 0.50 - 7.19 min. in the two groups respectively Cherkash (1957) in Russia reported that the differences between the milking time of fore and rear quatters may amount to 5.5 min. in cows with badly shaped udders, and pointed out adverse effect of machine milking on udder health in such cows. The problem of how long to leave the milking machine on a cow is complicated by the fact that time enough to milk the rear quarters results in leaving the milking machine on the fore quarters longer than necessary, (Matthews et al, 1941). On the other hand, if an effort is made to have the milking machine on the cow for as short a time as possible, particular attention must be given to the rear quarters, to see that the milk secreted by them is obtained at each milking. is very important particularly in our native buffaloes in which there is wide This point variation between yield and time of fore and rear quarters.

There was a strong relation between milk yield and milking time in buffaloes, Egyptian and Friesian cows (Table 3). The correlation coefficient between total yield and total time at morning and afternoon milking was 01254 and 0.441 in buffaloes, 0.375 and 0.672 in Egyptian cows and 0.506 and 0.486 in Friesian cows. The correlation coefficient between milk yield of the first period and milking time of this period at A.M. and P.M. was 0.688 and 0.650 for buffaloes, 0.620 and 0.697 in Egyptian cows. The correlation coefficant between stripping yield and time at A.M. & M.P. was 0.933 and 0.710 for buffaloes, 0.898 and 0.02 for Egyptian cows. The proportionality of the stripping yield and time to that of the total yield and time was greater at morning milking, that is at high milk yield. The striping yield yield was greater at the beginning of the lactation season especially in buffaloes (Fig. 1). This result denotes to the importance of stripping in high yielding, animals and at the high yield periods of the lactation season. However the correlation coefficient between total yield and stripping yield was not significant in buffaloes, being +0.017 & 0.269 at A.M. & P.M. & P.M. respectively while it was significant in Egyptian cows, being +0.491 & +0.527 at A.M. & P.M. respectively. Eisenreich (1955) stated that no relationship could be established between the amount of hand stripping and milk yield or milking time. Sheldon(1944) found no relation between the length of machine maling and the stripping product. The average weight of stripped milk was practically the same in a group of herds in which the average machine time was 7 minutes or more as in another group in which it was less than 5.5 man.

TABLE 3.—TIME OF MILKING AND YIELD OF WHOLE UDDER AT FIRST PERIOD AND STRIPPING IN A.M. & P.M. MILKINGS.

Bread	Morning Milking						Evening Milking					
	Production (lbs.)			Time (min.)			Production (lbs.)			Time (min.)		
	Total	1st. Period	Strip.	Total	1st Period	Strip.	Total	1st Period	Strip.	Total	1st Period	Strip.
Buffaloes . . .	10.0	7.0	5.0	8.7	5.6	3.1	5.3	3.9	1.4	5.1	3.5	1.6
Egyptian Cattle	7.5	4.8	2.7	6.3	3.4	2.9	4.2	3.1	1.1	4.4	2.9	1.5
Friestan . . .	13.8	6.6	7.2	6.4	3.4	3.0	8.8	4.5	4.5	4.6	2.4	2.2

2. *First minute (Initial) milk yield*:

The first minute yield of the udder (initial yield) as a percentage of the total yield showed the highest value in Egyptian cattle and the lowest in Friesians. The percentage values were greatest in the afternoon milkings than in the morning for all the breeds (table 4). It is clear from these results that the initial yield has a greater value whenever the production is low. The relation between the initial yield and total yield was found to be significant. The correlation coefficients were, 0.755 and 0.877 for buffaloes and 0.849 and 0.877 for Egyptian cattle at A.M. and P.M. milkings respectively. The regression coefficient was greater in Egyptian cattle (Fig. 1).

TABLE 4.—FIRST MINUTE (INITIAL) MILK YIELD IN RELATION TO THE TOTAL YIELD IN BUFFALOES, EGYPTIAN CATTLE AND FRIESIANS

Bread	Total yield (lbs.)		1st Minute yield (lbs.)		% to Total	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
Buffaloes	10.2	6.5	4.6	4.5	46.0	70.3
Eg. cows	7.9	4.7	5.1	3.7	64.4	75.2
Friesian	13.8	8.8	6.6	4.5	47.3	51.1

A.M. = Morning milking.

P.M. = Evening milking.

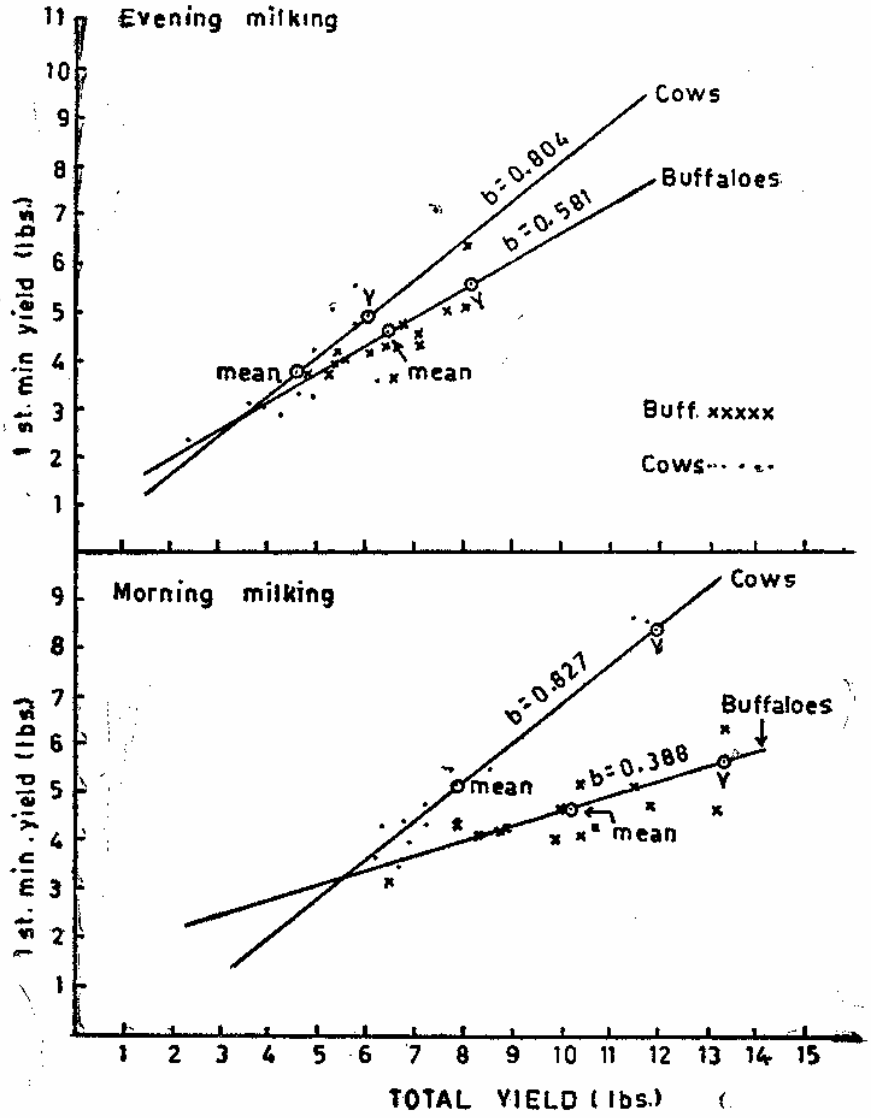

Fig. 1. Regression line of 1st. minute and total milk yield.

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