

A STUDY OF THE LACTATION CURVE OF THE EGYPTIAN NUBIAN GOAT

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SUMMARY

Weekly milk yield of 93 Egyptian Nubian goats raised on the farm of Faculty of Agriculture, Cairo University was recorded during 1983 and 1984. During the control day (day of milk recording) does were hand milked three times at equal intervals starting one week after kidding till the 20th week of lactation. Milk yield peaked at the second week of lactation, then decreased gradually till the 18th week. In the last two weeks, a slight increase in milk yield was observed. Age of doe had a significant effect on weekly milk yield except on the yield of the 20th week where age exerted no significant effect. Season and year of kidding had no significant effect on weekly milk yield except at the 20th week of lactation where the milk yield was significantly affected by kidding year.

Keywords: Egyptian Nubian goats, lactation curve

INTRODUCTION

In general, the lactation curve of goats and that of the Egyptian Nubian goats, in particular, has not been well studied. Goats reach the peak of their lactation 2 to 10 weeks after kidding (Gall, 1981). The author reported also that high yielding goats reach higher peak yield than low yielding goats. The period elapsed from delivery to the peak of production differed with the different levels of total milk yield being 5-6 weeks for the high milk producing Damascus goats (Louca *et al.*,

1975) whereas was 2-3 weeks for low producing goats (Aboul-Naga and El-Shobokshy, 1981; Alexandre, 1981 and Ashmawi, 1985). This period was also found to vary with the length of suckling period. Zygoyiannis (1987) reported that Greek goats with a 6-week suckling period reached their peak of milk yield (1.59 kg/day) in the 6th week of lactation, whereas those with 12-week suckling period reached their maximum milk yield (1.64 kg/day) in the 10th week. After weaning, milk yield of both groups declined rapidly until the end of lactation (36 weeks).

The present investigation aimed at identifying the lactation curve of the Egyptian Nubian goats (locally called Zaraibi) and studying some non-genetic factors affecting it.

MATERIALS AND METHODS

Data were collected on 93 Egyptian Nubian goats raised in the sheep and goat farm of the Faculty of Agriculture, Cairo University, Giza, Egypt during the period from March 1983 till March 1985.

Does were fed on Egyptian clover (Trifolium alexandrinum), sorghum (Sorghum vulgare var. saccharatum Boeri) and clover hay according to their availability and were daily supplemented with 750 g. of concentrates per head.

Throughout the first year (1983) bucks were allowed to breed does in estrus at any time of the year, while in the second year (1984), mating was allowed only in August and September (mating season).

Milk production was recorded at weekly intervals starting one week after kidding till the 20th week of lactation. On the day of milk control (day of milk recording), does were hand milked three times a day at 8-hour intervals (6 a.m., 2 p.m. and 10 p.m.). Kids were separated from their dams in an adjacent pen to avoid agitation between milkings. After each milking, kids were bottle-fed the milk of their own mothers. Milk was weighed on a beam balance to the nearest 5 g. Kids were weaned at 10 weeks of age and were separated from their dams. After weaning, does were milked twice daily, in the morning and in the afternoon, except in the control day where they were milked three times. Does were considered dry when their milk yield dropped to 100 g. per day.

Least squares analysis of variance with unequal subclass numbers (Harvey, 1960) was used to analyze weekly milk yield. A statistical model with the main fixed effects of age, season and year of kidding was performed.

RESULTS AND DISCUSSION

A lactation curve (Fig. 1a) was drawn from the overall means of the weekly milk yield. The peak of lactation (8.1 kg) was reached in the second week, than a slight decrease in milk yield was observed till the 4th week where weekly milk yield equalized approximately that of the first week. After the 4th week, the decrease in weekly milk yield with the advancement of lactation period became more steeper until the 18th week, afterwards, a slight increase during the last two weeks was observed. This increase in weekly milk yield during the last two weeks may be due to that the lactations of low producing does terminated earlier and the higher producing ones were still milking until this late stage of lactation period, so the mean of weekly milk yield of such animals rose slightly than before.

The time elapsed from delivery until reaching the peak of lactation was approximately similar to that reported for some breeds in Egypt. Aboul-Naga and El-Shobokshy (1981) found the peak milk yield of 33 Egyptian Nubian goats to be reached on the 2nd or 3rd week of lactation and Ashmawi (1985) working on 31 Baladi goats found this peak to be attained during the first or second week. Louca *et al.* (1975) reported that the high producing Damascus goats needed 5-6 weeks to reach their maximum daily milk yield.

Factors affecting weekly milk yield

Age of doe

Figure (1b) shows that peak of the lactation curve for all age groups was attained in the second week of lactation, except for does aged 1 to <2 years where the yield peaked during the first two weeks of lactation. Does aged 4 years and over had the highest peak (10.1 kg), followed by those aged 3 to <4 years (8.7 kg) whereas does aged 1 to <2 years had the lowest peak (6.1 kg). Lactation curves of the oldest and youngest does showed marked persistency during the first 4 weeks

of lactation than other age groups, but at higher level for the former group and lower level for the second. After reaching the peak of production, lactation curves of all age groups showed a gradual decline towards the end of lactation period although a slight increase in weekly milk yield during the last two weeks was observed in the youngest two groups.

Table (1) shows that age of doe had a significant effect ($p < 0.01$) on weekly milk yield in the first 18 weeks. Concerning the last two weeks of lactation, age had a significant effect ($p < 0.05$) on milk yield in the 19th week while did not significantly affect that in the last week.

Season of kidding

In all seasons, the peak of the lactation curves was reached in the second week of lactation (Fig. 1c). Does kidding in autumn had the highest peak (8.8 kg) followed by those kidding in summer (8.1 kg) whereas does kidding in spring had the lowest peak yield (7.6 kg). Does kidding in summer showed marked persistency in lactation level till the 8th week of lactation period whereas those kidding in autumn possessed a steep decline in milk production after the 4th week, though had the highest yield during the first month. Summer season is warmer and was characterized by low kid mortality than the cold autumn months (November and December). This may be the reason of the rapid decline in milk yield of autumn kidding does since number of kids suckling affects greatly milk yield of does (Ahmed and Tantawy, 1960). However, season of kidding had no significant influence on weekly milk yield during the whole lactation period (Table 1).

Year of kidding

Figure (1d) shows also that peak of weekly milk yield for does kidding in either 1983 or 1984 was attained in the second week of lactation. The peak was slightly higher in 1983 (8.2 kg) than in 1984 (8.0 kg). It could be observed that during the descending phase of lactation curve, does kidding in 1983 had slightly higher yield until the 18th week than those kidding in 1984. An obvious increase in milk production for does kidding in 1984 during the last two weeks of lactation was observed.

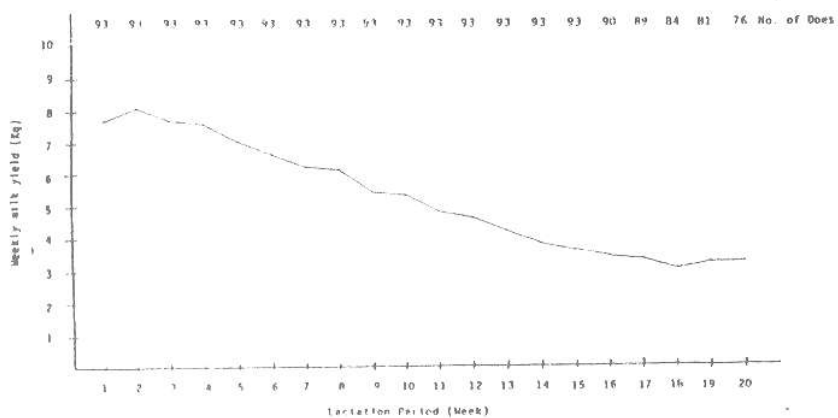


Fig. 1a. Overall lactation curve of Egyptian Nubian goats.

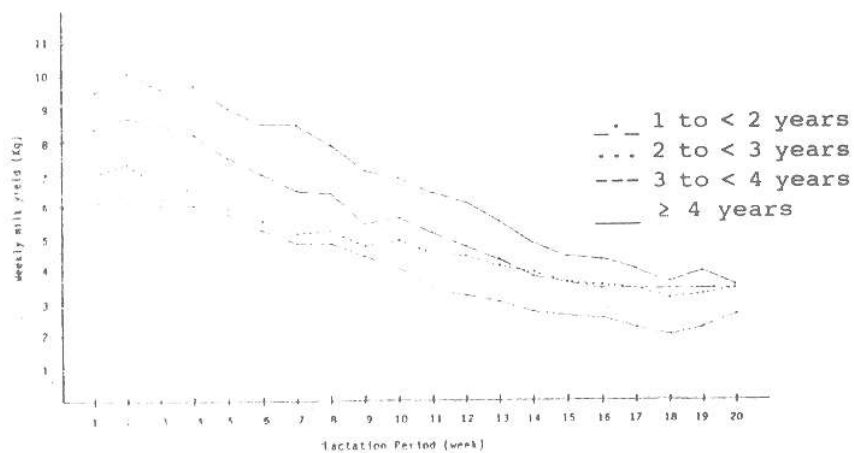


Fig. 1b. Age of kidding.

Fig. 1. Effects on lactation curves.

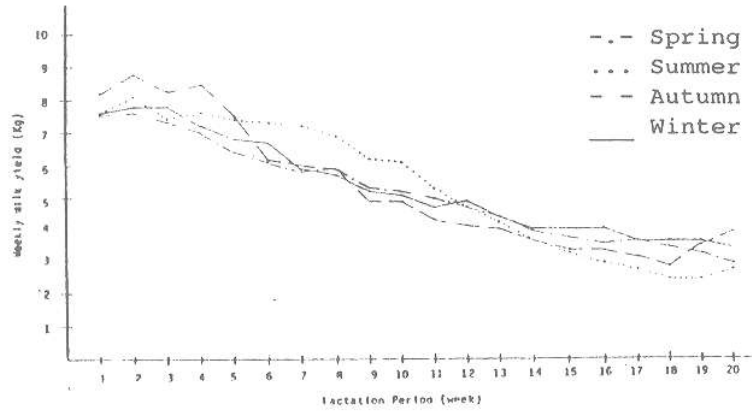


Fig. 1c. Season of kidding

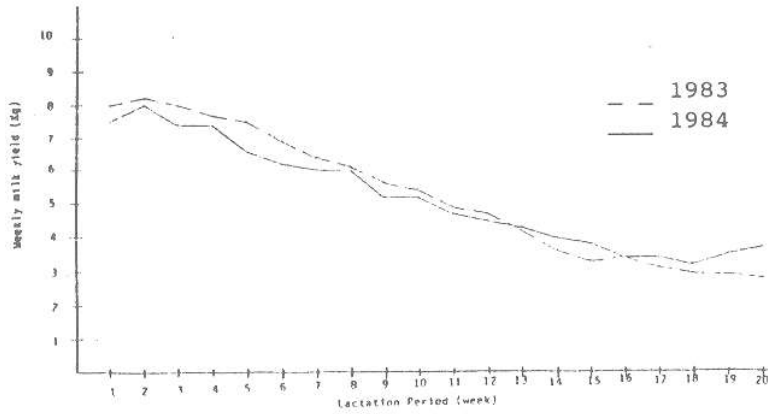


Fig. 1d. Year of kidding.

Fig. 1. Cont.

Table (1) shows that year of kidding had no significant influence on weekly milk yield except in the 20th week of lactation where milk yield was significantly ($P < 0.05$) affected by kidding year.

Table 1. Least squares analysis of variance of weekly milk yield of Egyptian Nubian goats

Week	Age of doe at kidding(1)		Source of Variation				Residual	
	DF	M.S.	DF	M.S.	DF	M.S.	DF	M.S.
1	3	46.57**	3	1.01	1	4.78	85	4.84
2	3	61.74**	3	3.28	1	0.51	85	5.42
3	3	55.18**	3	2.79	1	5.06	85	4.61
4	3	59.15**	3	4.97	1	1.15	85	5.02
5	3	47.74**	3	4.73	1	10.29	85	3.88
6	3	47.24**	3	5.30	1	6.93	85	4.08
7	3	56.35**	3	7.84	1	1.79	85	3.65
8	3	40.84**	3	6.41	1	0.17	85	4.12
9	3	28.81**	3	5.28	1	1.79	85	3.63
10	3	31.62**	3	5.09	1	0.47	85	3.87
11	3	29.96**	3	2.61	1	0.50	85	2.40
12	3	28.85**	3	1.32	1	1.00	85	3.38
13	3	21.56**	3	0.49	1	0.12	85	2.91
14	3	14.26**	3	0.78	1	2.63	85	2.30
15	3	11.81**	3	2.15	1	2.32	85	2.36
16	3	10.73**	3	3.84	1	0.04	82	2.23
17	3	11.89**	3	3.36	1	0.94	81	1.87
18	3	8.94**	3	4.13	1	0.82	76	2.04
19	3	9.37**	3	4.12	1	4.23	73	2.44
20	3	2.92**	3	2.32	1	10.32*	68	1.94

(1) 1 to <2years, 2 to <3years, 3 to <4years and ≥ 4 years.

(2) Spring, summer, autumn and winter.

(3) 1983 and 1984.

* $P < 0.05$, ** $p < 0.01$.

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دراسة عن منحني الادارة في الماعز

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تم تسجيل انتاج اللبن اسبوعيا لعدد ٩٣ عنزته نوبى مصرى مرياه فى مزرعة الأغنام والماعز بكلية الزراعة - جامعة القاهرة خلال عامى ١٩٨٣ و١٩٨٤. وفى يوم الاختبار الاسبوعى حلبت الماعز يدويا ثلاث مرات وعلى فترات متساويه وذلك ابتداءا من الاسبوع الأول بعد الولاده وحتى الأسبوع العشرين من الإدرار.

حدث اقصى انتاج للبن عند الاسبوع الثانى من الادرار ثم انخفض الانتاج تدريجيا حتى الاسبوع الثامن عشر. وفى الاسبوعين الاخرين من الادرار حدثت زيادة طفيفه فى انتاج اللبن.

كان لعمر العنزته تأثيرا معنويا على انتاج اللبن الاسبوعى ولكن لم يتأثر الانتاج فى الاسبوع العشرين معنويا بواسطة العمر. لم يكن لموسم وسنة الولاده تأثيرا معنويا على انتاج اللبن الاسبوعى الا أن انتاج اللبن فى الاسبوع العشرين من الادرار قد تأثر معنويا بواسطة سنة الولاده.