

STUDIES ON THE MILK YIELD OF TWO
FAT-TAILED BREEDS OF SHEEP DURING
THE SUCKLING PERIOD

By

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ABSTRACT

Milk yield of 30 Barki and 27 Turkish ewes was estimated during the suckling period (10 weeks) by the lamb-suckling technique. Milk yield averaged 30.77 and 45.23 Kg for Barki and Turkish sheep, resp. Breed of ewes had a significant effect ($P < 0.01$) on milk yield. Age and weight of ewe as well as birth weight of lamb did not significantly affect milk yield. Milk yield had no significant relationship with udder and teat measurements except that with udder width which was significant ($P < 0.05$).

INTRODUCTION

The importance of milk production in non-dairy ewes lies in the effect of milk yield on the growth of the lambs. Under practical farming conditions the survival and growth of young lambs particularly during the first few weeks of life depend largely on the existence of an adequate supply of milk in the ewe (Munro, 1955; Coombe et al., 1960; Munro, 1962 and Sacker and Trail, 1966). Many studies are published on the effect of non-genetic sources of variation on milk yield of foreign breeds of sheep (Owen, 1957; Sacker and Trail, 1966; Krizek et al., 1979; Geenty, 1980 and Mavrogenis and Louca, 1980). In Egypt, few studies concerning the milking

ability of the native and imported breeds of sheep are available (Sharafeldin and Mostageer, 1961; El-Shahat, 1970; Barghout, 1975; Farag, 1979 and AboulNaga et al., 1981). The present work was aimed to estimate the milk production of two fat-tailed breeds of sheep (Ossimi and Turkish) during the period from lambing till weaning the lambs at 10 weeks of age, and to study the influence of some non-genetic factors affecting milk yield of ewes during this period.

MATERIAL AND METHODS

1. Source of data:

Lactation records of 30 Barki and 27 Turkish ewes belonging to El-Magd farm, North Tahreer Agricultural Company were analysed. The flock was run under an accelerated lambing system allowing the ewes to lamb three times in two consecutive years.

Data were collected during the early winter lambing season of 1982 (October and November). The ewes lambed within a period of about two weeks from October, 6 till October, 19. All ewes gave birth to single lambs. Animals were grazed on alfa-alfa (*Medicago Sativa*) during the experimental period (10 weeks) and were supplemented with 0.75 Kg of concentrates daily per head. The concentrate mixture consisted of 35% barley, 25% wheat bran, 20% rice bran and 20% corticated cotton-seed cake. Mineral licks and water were available all the time. Wheat straw was given ad lib. in the morning before the animals were driven to pasture.

Within 24 hours after birth, lambs were ear tagged. Each pair of lamb-ewe was weighed and was marked by a painted number on the side to be easily identified.

One week after lambing udder length, width and depth as well as teat length, circumference and the distance between teats were measured.

2. Experimental procedure:

Milk yield was measured over a 24-hr period, at weekly intervals, starting one week after birth till weaning the lambs at 10 weeks of age. Ewes were divided into 2 groups according to the day of lambing. On the test day, the group to be tested was kept indoors. The lambs were separated from their dams in an adjacent pen to see each other and to minimize agitation due to separation of lambs and ewes. Suckling was allowed three times at 8 hr. intervals and lambs were weighed on a beam balance to the nearest 5 grams before and after suckling. The increase in lamb's weight after each suckling was considered as the milk consumption at that specific suckling. Daily yield was calculated as the sum of all milk consumed in a period of 24 hr. Weekly milk yield was estimated by multiplying the daily yield by 7 except that of the first week of lactation where the daily yield was multiplied by 4 since the milk of the first 3 days was considered as collustrum.

3. Statistical analysis:

The analysis of the data was carried out using the least squares method (Harvey, 1960). The following model was assumed to underly each observation (10-week milk yield).

$$X_{ijk} = \mu + d_i + a_j + b_m ({}_m Y_{ijk} - \bar{m} \bar{Y}) + e_{ijk}$$

where X_{ijk} = the observation of the k th animal, in the j th age group and the i th breed,

μ = overall mean of X_{ijk} when equal subclass numbers exist,

d_i = an effect due to the i th breed (Turkish and Barki),

a_j = an effect due to the j th age group, and $j = 1, 2, 3$

where:

1 = less than 2 years

2 = 2 years to 5 years

3 = more than 5 years

b_m = the partial regression coefficients of X on the m th independent variable, and $m = 1, 2, \dots, 8$,

where b_1 = the partial regression of X on dam weight,

b_2 = " " " " udder length,

b_3 = " " " " " width,

b_4 = " " " " " depth,

b_5 = " " " " " teat length,

b_6 = " " " " " circumference

b_7 = " " " " " distance

b_8 = " " " " " birth weight of lamb,

m^{Y}_{ijk} = The observation of the m th variable, on the k th animal, in the j th age group and the i th breed,

$m\bar{Y}$ = The mean of the m^{Y}_{ijk} and

e_{ijk} = random error.

RESULTS AND DISCUSSION

Sources of variation:

The overall milk yield during the first 10 weeks of lactation (suckling period) was 38.0 Kg. The average milk production of Turkish ewes was markedly higher than that of the Barki ones (45.23 vs. 30.77 kg). Turkish ewes produced about 47% more milk than the Barki Breed of ewes exerted a highly significant influence ($P < 0.01$) on their milk yield (Table 2). The estimate for the Barki was very close to that reported by Barghout

Table (1): Least squares means (\bar{X}) and partial regression coefficients (b) with the corresponding standard errors (SE) of 10-week milk yield of ewes.

Classification	\bar{X} Or b (Kg)	SE
Overall	38.00	1.38
<u>Breed</u>		
Turkish	45.23	2.38
Barki	30.77	2.30
<u>Age</u>		
Less than 2 years	32.81	3.40
2 - 5 years	40.82	1.95
more than 5 years	40.38	2.65
<u>Reg. Coeff. on</u>		
ewe weight	0.017	0.304
udder length	0.338	1.460
" width	3.303*	1.648
" depth	0.430	1.610
teat length	-0.876	4.169
" circumf.	-1.809	3.036
" distance	-0.138	1.974
lamb birth wt.	0.476	2.318

* = P<0.05

Table (2): Analysis of variance of 10-week milk yield.

SV	df	MS
Bet. Breeds	1	1332.32**
Bet. Ages	2	175.62
Reg. on		
ewe wt.	1	0.29
udder length	1	4.87
" width	1	366.15*
" depth	1	6.49
teat length	1	4.02
" circumf.	1	32.38
" distance	1	0.45
lamb birth wt.	1	3.84
Error	45	91.13

** = P<0.01

* = P<0.05

(1975) who estimated an average milk yield of 31.63Kg during the first 10 weeks of the lactation period for this breed. During the first 12 weeks of lactation, Aboul-Naga et al. found that Barki ewes produced the least amount of milk as compared to the Rahmani and Ossimi breeds (59.29 kg vs. 65.08 Kg and 65.44 Kg for the three breeds, resp.). Sharafeldin and Mostageer (1961) also reported early higher amount of milk for the Ossimi and Rahmani ewes during the first 12 weeks of lactation being 53.5 and 48.1Kg for the two breeds, resp. The magnitude of the variance of the different sources of variation affecting milk yield (Table 2) indicates that breed was the most important source of variation affecting this trait. Mavrogenis and Louca (1980), Aboul-Naga et al.(1981), Doney et al.(1981) and Erokhin et al.(1984) are amongst those who found significant differences in milk yield of sheep due to the effect of breed.

2. Age of ewe:

Milk production increased with increasing age of ewe up to five years and a very slight decrease was observed thereafter (table 1). Table 2 shows that the differences in milk production due to different ages were statistically insignificant. Similar results to that obtained in the present study were reported by Munro (1962), Karam et al.(1971), Aboul-Naga et al.(1981) and Ruelas and Zarazua (1982).

3. Body weight of ewe:

No relationship was found between body weight of ewe at lambing and her milk production (table 2). The regression coefficient of milk yield on ewe's body weight was 0.338 Kg milk (table 1). This result indicates that within breed classification, body weight of ewe

had no significant influence on milk yield of ewes. Loizek et al.(1979), Geenty (1980), Aboul-Naga et al.(1981) and Hatjiminaoglou et al.(1983) reported no significant differences in milk yield of ewes due to their body weight. Barghout (1975) found that though the simple correlation coefficient between body weight of 153 Barki ewes and their milk production was highly significant, the partial correlation between the two variables keeping udder width constant was insignificant. The author concluded that most of the association between milk yield and body weight of ewe might be a reflection of the correlation between udder width and milk yield.

4. Udder and teat measurements:

Milk production seemed to be independent of all udder measurements except udder width ($P < 0.05$) as shown in table 2. The regression coefficient of milk production on udder width was 3.30 Kg milk. The regressions on udder length and udder depth were positive but not significant. Negative but also insignificant regression coefficients were found for milk yield on each of teat length, circumference and distance between teats. These findings agree with that reported by Burris and Baugus (1955), Owen (1957), and Munro (1962) who found that udder width was the only measurement which was significantly correlated with milk production. Barghout (1975) found a significant association between milk production and all the udder measurements of Barki. Meanwhile, McKeown (1962) and Malik (1970) reported no significant association between milk production and teat measurements.

5. Birth weight of lamb:

Tables 1 and 2 indicate no significant regression of milk yield of ewe over the birth weight of her lamb. This result supports the findings of Coombe et al.(1960),

McGloughlin and Crowley (1970) and Karam et al.(1971). The authors reported insignificant relationship between birth weight of lamb and milk yield of its dam. Barghout (1975) found that the partial correlation between birth weight of lambs and milk yield of their dams holding dam weight constant was insignificant whereas the simple correlation between them was highly significant. This might indicate that milk yield of dam would be associated with lambs weight through other sources of variation.

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دراسات عن انتاج اللبن خلال فترة الرضاعة
لنوعين من الاغنام ذات اللبنة

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الملخص

قدر انتاج اللبن فى ٣٠ نعجة برقى ، ٢٧ نعجة تركى خلال فترة الرضاعة (١٠ اسابيع) باستخدام طريقة رضاعة الحملان. وقد كان متوسط انتاج اللبن لكل من البرقى والتركى ٣٠٧٧ر ، ٤٥٢٣ر كجم على التوالى، وكان لنوع النعاج تأثير معنوى على ناتج اللبن. ولم يؤثر عمر النعجة او وزنها او وزن الحمل عند الميلاد معنويا على ناتج اللبن. كما لم توجد علاقة معنوية بين انتاج اللبن ومقاييس كل من الضرع والحلمة ماعدا تلك العلاقة بين انتاج اللبن وعرض الضرع حيث كانت معنوية (احتمال ٥٪).