IV- RESULTS AND DISCUSSION

Results of this study will be presented under the following items.

A) Livebody weight change of ewes during different stages presented in Table 1.

B) Oestrus behaviour and lambing performance.

C) Livebody weight changes of lambs from birth to 6 months of age.

1- Birth weight.

2- Weaning weight.

3- Daily gain from birth to weaning.

4- Weight at 6 months of age.

5- Daily gain from weaning to 6 months.

6- Daily gain of lambs from birth to 6 months of age.

D) Feed intake of ewes and lambs during the experimental period.

E) Biological efficiency of meat production.

In this context results will be presented for both experimental and commercial farms separately and comparisons between both farms are made whenever it is available.

A. Livebody Weight Change of Ewes

As previously mentioned, ewes of both experimental and commercial **farms** were weighed at monthly intervals starting from mating up to the end of the year. However, emphasis will be given to weights at critical periods, the results of which are shown in Table (1). The average weights over all occasions are presented graphically in figure (1). Average livebody weights for experimental and commercial **farms** were 35.1 and 39.5 kg., respectively. Live body weight gains, in the 51 days mating period, were 6.7 and 0.2 kg. in the experimental and commercial **farms**, respectively.

The finial weight gains from mating to just before lambing were 7.9 and 2.7 kg. in the experimental and commercial **farms** , respectively.

Average body gain **encountered in the present work** was below that recommended by Younis et al (1979) for Awassi ewes, the value of which was 12½ kg.

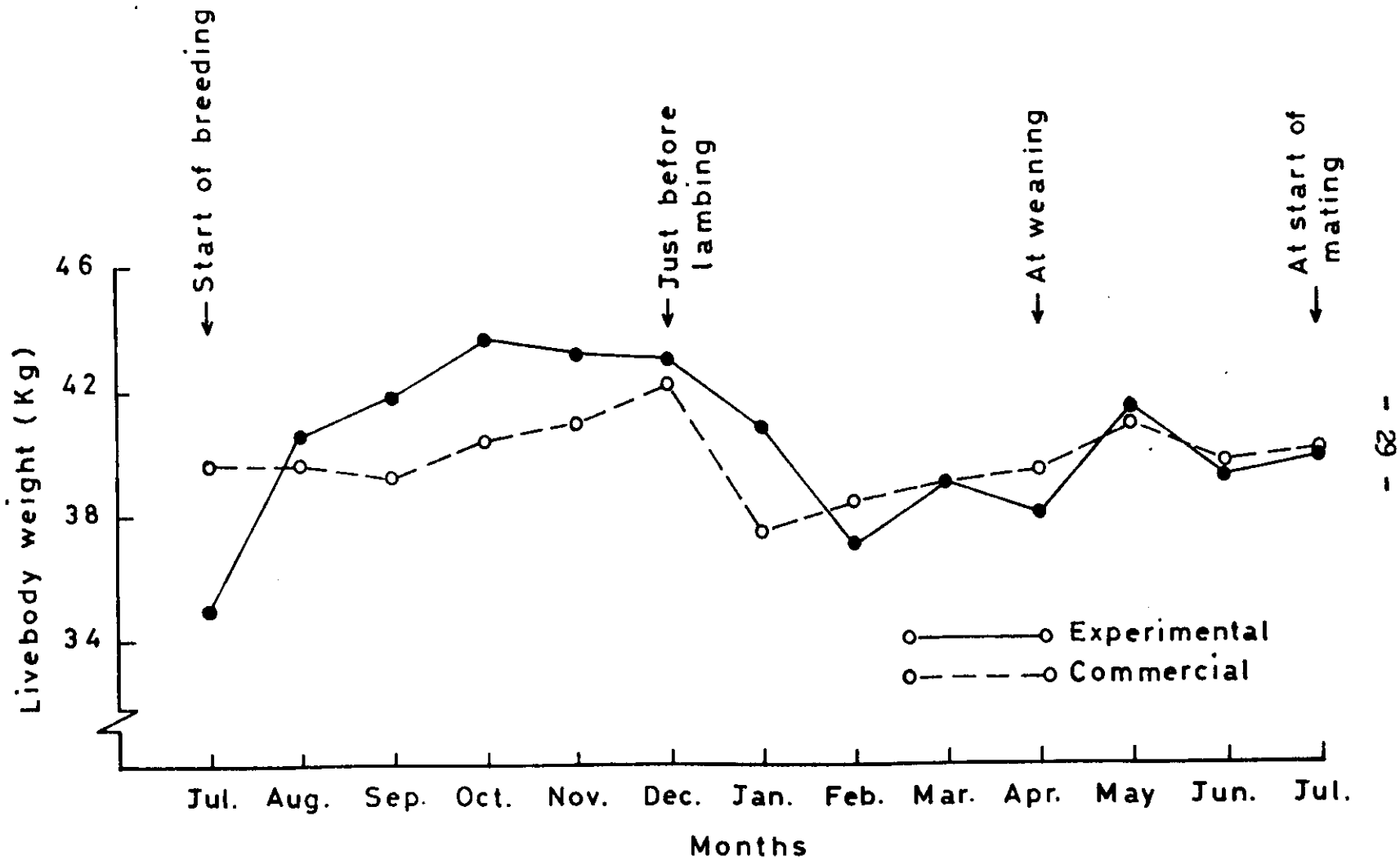

Fig.(1) Livebody weight change of ewes of both Experimental and Commercial flocks over the experimental period (one year)

Table 1: Average livebody weight of ewes (kg) of experimental and commercial farms over specific occaisons. (Mean ± S.E.)

Time	Experimental farm	Commercial farm
At the start of breeding season	35.1 ± 0.62	39.5 ± 0.34
End of mating	41.8 ± 0.65	39.3 ± 0.33
Just before lambing	43.0 ± 0.79	42.2 ± 0.37
At weaning	38.1 ± 0.72	39.3 ± 0.32
At the start of next breeding season	39.8 ± 0.65	40.1 ± 0.37

B- Oestrus Behaviour and Lambing Performance

The mean of the oestrus cycle length is 14.20 days, in the experimental farm(Table 2). This estimate is below that given for the same trait in the literature (17.30 days, Badawy,et al.1973; 15.44 days, Bedeir, 1978)for the same breed.

The average number of services per conception in the experimental farm was found to be 1.5(Table 2). This value is close to the estimates of 1.20, 1.33 and 1.34 reported previously on Barki sheep by Hafez (1954), Mabrouk (1970) and Bedeir (1978), respectively.

Average conception rate was found to be 82.2 and 61.4% for the experimental and commercial farm, respectively (Table 2). Differences were highly significant as shown in Table (3). It is apparent that the value of the experimental farm is higher than that of the commercial one. Such difference (20.8%) may be due to the variation in the management conditions, mainly nutrition. It must be indicated that the experimental farm had better feeding and management conditions, than those of the commercial one. Bedeir (1978) reported a medium value of 77% for the same breed.

Table (2): Oestrous behaviour and lambing performance for both experimental (E) and commercial (C) flocks.

Item	E.	C.
No. of ewes joined	146	148
Average single cycle length (days).	14.20±0.47	---
No. of ewes marked by rams.	144	---
No. of ewes concieved.	120	99
No.of services per conception.	1.5	---
Conception rate %	82.2	61.4
No. of ewes lambed	119	99
No. of lambs born alive	116	102
No. of lambs died at birth	4	---
Lambing rate	81.5	66.9
Lambing %	79.5	68.9
Average Gestation length(days).	151 ± 0.30	----
Average Litter size (A.L.S.)	1.01	1.03
No. of lambs weaned.	104	91.
% of lambs weaned	71.2	61.5

$$\text{conception rate} = \frac{\text{No of ewes concieved}}{\text{No of ewes joined}}$$

$$\text{lambing rate} = \frac{\text{No of ewes lambed}}{\text{No of ewes joined}}$$

$$\text{Lambing \%} = \frac{\text{No. of lambs born alive}}{\text{No of ewes joined}}$$

$$\text{A.L.S.} = \frac{\text{No. of lambs born}}{\text{No. of ewes lambed}}$$

$$\text{\% lambs weaned} = \frac{\text{No. of lambs weaned}}{\text{No. of ewes joined}}$$

Table (3): Analysis of variance for conception rate.

S.O.V.	D.F.	S.S.	M.S.
Between flocks	1	0.429	0.429 **
Within	293	0.099	0.0003

** $P < 0.01$

Lambing rates, expressed as the number of ewes lambing per ewe bred, are 81.5 and 66.9% for experimental and commercial farms, respectively (Table 2). The high value of the experimental farm is a result of its high conception rate and improved management. A similar value, 79.2%, was reported for the same breed by Mabrouk (1970). However, the value of the commercial farm is in agreement with previous results reported by Younis and Galal (1973) 66.6%, and Bedeir (1978) 70% on the Barki Breed.

Average gestation length, as estimated in the experimental flock, was found to be 151 ± 0.30 days (Table 2), which is considered a normal gestation length for sheep (Hafez, 1952) .

Number of lambs weaned as a percentage of ewes joined was found to be 71.23 and 61.49% for the experimental and commercial farm, respectively (Table 2) . The latter value is consistent with results of Bedeir (1978) who reported a value of 59.0% for the same breed .

Mortality of lambs was estimated as the difference between lambing % and % lambs weaned being 8.3 and 7.4%

for the experimental and commercial farms , respectively, which is considered acceptable when compared with 6.2 and 14.8% reported by Labban et al,(1966) and Mabrouk (1970).

C-Livebody Weight

1- Birth weight:

The least squares constants, standard errors and the test of significance between constants as well as the percentage of variation due to each factor influencing birth weight are presented in Table (4).

Results of the analysis of variance for the same data are presented in table (5).

The overall mean of birth weight of Barki lambs was found to be 3.42 kg. which is close to the value of 3.41 kg. obtained by Fahmy et al. (1969). The estimate of the present study, however is more than those reported by Aboul-Naga (1972), 2.69 kg., El-Kouni et al. (1974), 2.34 kg., and El-Kimary (1975), 2.36 kg. Such differences may be due to differences in the environmental conditions under which different experiments were conducted.

Averages of birth weight of Barki lambs born at the experimental and commercial farms were 3.51 and 3.33 kg., respectively; differences were not significant. However, the slight superiority of the experimental farm (180 gm) may reflect better management and feeding conditions. This

Table 4: Least squares constants, standard errors (S.E) and Duncan multiple range test (DMRT) of differences between constants for birth weight of Barki lambs (kg).

Classification	No.	Const. ± S.E.	DMRT
General mean	220	3.42 ± 0.041	
Farm			
Experimental	118	0.09 ± 0.049	a
Commercial	102	-0.09 ± 0.049	a
Sex			
Male	117	0.11 ± 0.039	a
Female	103	-0.11 ± 0.039	b
Age of dam			
1.5 yrs	51	-0.13 ± 0.084	ac
>1.5-2.5 yrs	75	-0.20 ± 0.068	a
>2.5-3.5 yrs	33	0.18 ± 0.087	b
>3.5-4.5 yrs	37	-0.05 ± 0.084	ab
> 4.5 yrs	24	0.20 ± 0.105	bc
Weight of dam			
25 - 35 kg	79	-0.03 ± 0.064	a
36 - 40 kg	83	-0.01 ± 0.055	a
> 40 kg	58	0.04 ± 0.062	a

Constants within the same classification having the same letter do not differ significantly from each other.

Table (5): Least squares analysis of variance and variance components (v% of the different factors effecting birth weight.

S.O.V.	D.F.	M.S.	v %
Farm	1	0.9958	2.95
Sex	1	2.5552**	5.97
Age of dam	4	1.1609**	6.25
Weight of dam	2	0.0581	0.00
Residual	211	0.3110	84.83

** $P < 0.01$

v % Percentage of variance components.

is supported by results obtained on feeding conditions of both farms as will be described later.

As expected, male lambs exceeded significantly female ones in birth weight (3.53 VS. 3.31 kg). This agrees with most of the work cited in the literature for different breeds of sheep and under different environmental conditions (Maymon and Dattillo , 1962; Fahmy, 1964; Juma & Faraj, 1966; El-Tawil et al., 1970; El-Kimary, 1975). On the other hand, Kassab and Karam (1961), working on Barki Sheep, found that sex differences were slight and non-significant.

With the exception of >3.5-4.5years old dams there is a trend of an increase in birth weight of lambs with the advancement of age of their dams. The youngest ewes (≤ 1.5 - 2.5 yr) gave birth to lighter lambs. Such trend may be due to changes which occur in the uterine environment and to the ability of older ewes to consume more food. Kassab & Karam (1961) found that Barki lambs out of mature ewes were heavier than those out of 2-year old ones. They reported that birth weight of lambs increased with the advancement of age of dam till six years of age after which lambs born to dams older than six years were lighter than those born by younger ewes. Similar results were also reported by Hamada (1959).

Age of dam accounted for 6.25% of the total variance in birth weight of its lamb(Table 5)Fahmy et al. (1969), and Aboul-Naga et al. (1972) reported that age of dam in Barki sheep accounted for 7.9% of the total variation in this trait.

There was an increase, though not significant, in the average birth weight of lambs with the increase in live body weight of their dams. These results once again support the hypothesis of changes in the uterine environment with the advancement of both age and weight of dam. It is realised that both age and weight of ewes are correlated to some extent (Hamada, 1959 ; Kassab and Karam 1961).

It has to be indicated that all factors studied (farm , sex, age of dam and weight of dam) have contributed only 15.17% of the total variability in birth weight which means that factors other than those included in the model were responsible for most of the variability (84.83%) However, sex and age of dam have shown the highest contribution, 5.9 and 6.25 %, respectively.

It is known that type of birth contributes markedly to the average birth weight of lamb (Fahmy et al.1969),but such variable was not included in the present study due to the fact that the incidence of twinning was very rare in both experimental and commercial farms

2- Weaning weight:

The overall mean of weaning weight of Barki lambs was found to be 19.91 kg (Table 6). This estimate is higher than most estimates reported on the same breed. Fahmy et al. (1969) reported an estimate of 18.37 kg. for the weaning weight of Barki lambs under desert conditions. Other estimates reported for the same breed, under farm conditions, ranged from 16.08 to 17.12 kg (Aboul-Naga, 1972; El-Kouni et al., 1974; El-Kimary, 1975). Figure 2 shows changes in body weight of lambs from birth to 6 months old.

Lambs weaned from the experimental farm exceeded their counterparts, from the commercial one, by 3.36 kg. (21.59 vs. 18.23) in the average weaning weight, the difference of which was significant. These results go parallel with those previously reported on birth weight of lambs. Therefore, the superiorty of lambs from the experimental farm is expected since birth weight is known to be correlated with the weaning weight. Part of this superiority, however, may be due to differences in management and feeding conditions among both farms from birth to the weaning age. The estimate obtained

Table (6): Least squares constants, standard errors (S.E) and Duncan multiple range test (DMRT) of differences between constants for weaning weight kg.

Classification	N	Const. ± S.E.	DMRT
General mean	195	19.91 ± 0.268	
Farm			
Experimental	104	1.68 ± 0.324	a
Commercial	91	- 1.68 ± 0.324	b
Sex			
Male	100	0.92 ± 0.256	a
Female	95	- 0.92 ± 0.256	b
Age of dam			
1.5 yrs	46	- 1.64 ± 0.551	a
>1.5- 2.5 yrs	66	- 1.22 ± 0.448	a
>2.5- 3.5 yrs	29	1.51 ± 0.569	b
>3.5- 4.5 yrs	33	0.67 ± 0.552	b
> 4.5 yrs	21	0.68 ± 0.686	b
Weight of dam			
25 - 35 kg	70	- 0.54 ± 0.417	a
36 - 40 kg	75	0.30 ± 0.359	a
> 40 kg	50	0.24 ± 0.409	a

Constant within the same classification having the same letter do not differ significantly from each other.

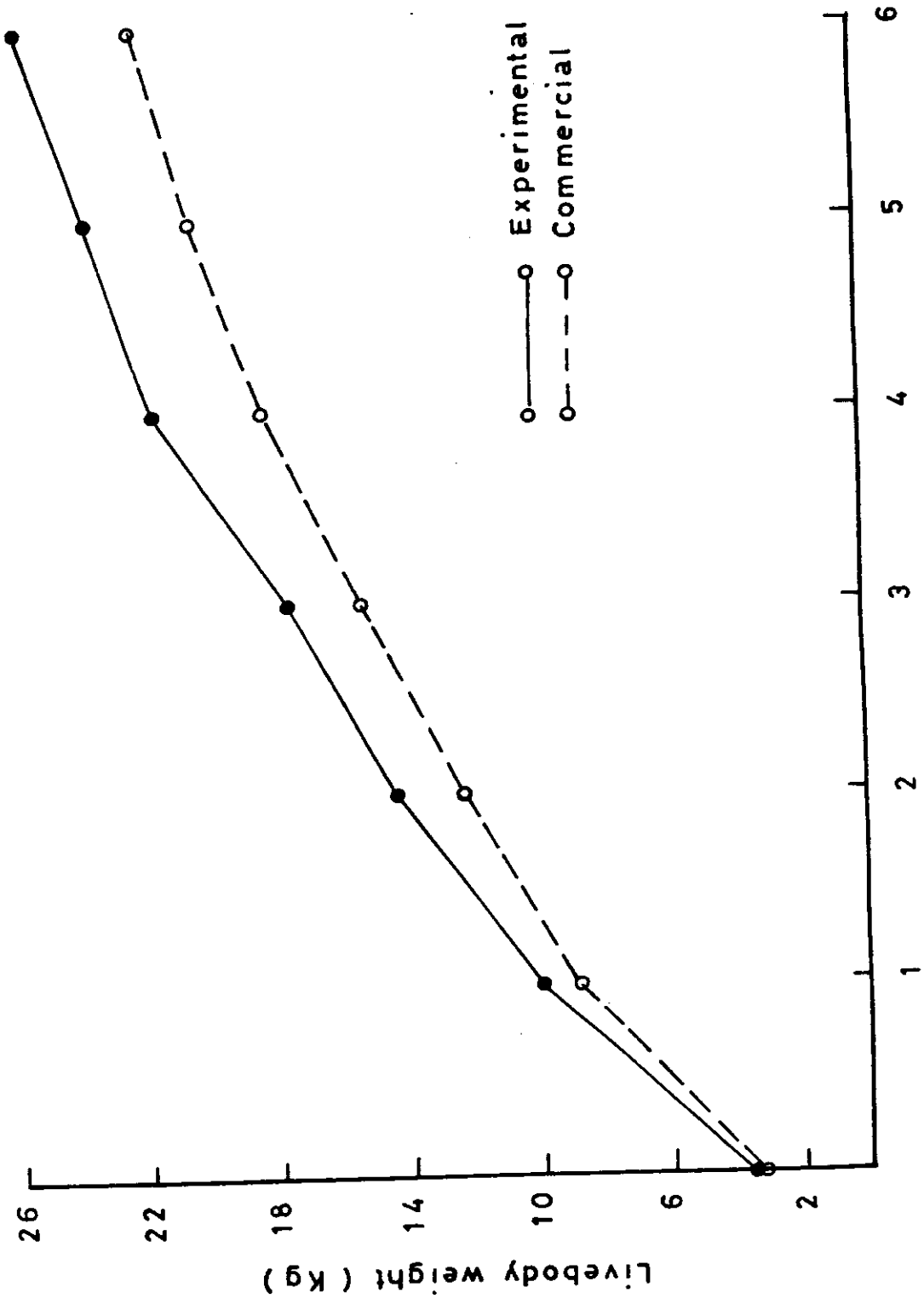

Fig. (2) Changes in livebody weight of lambs from birth to 6 months old.

Table (7): Least squares analysis of variance of weaning weight.

S.O.V.	d.f	M.S	V %
Farm	1	314.3709 **	26.94
Sex	1	149.9620 **	7.66
Age of dam	4	60.1240 **	7.35
Weight of dam	2	10.2093	0.00
Residual	186	11.7201	58.05

** $P < 0.01$

V%, Percentage of variance components.

under the commercial farm conditions compares favourably with that of 18.37 kg. reported by Fahmy et al. (1969).

Among all factors studied, the farm (table 7) contributed the highest value to the total variance (26.94%).

As expected, the average weaning weight of male lambs was significantly higher than that of females (20.83 vs. 18.99 kg). Similar results were reported by Sliwa et al. (1962), Sidwell et al. (1964) and Smith and Lidvell (1964) on different breeds of sheep. Sex (Table 7) accounted for 7.66% of the total variance in this trait. Fahmy et al. (1969), Aboul-Naga et al. (1972) and El-Kouni et al. (1974) found a highly significant sex effect on weaning weight of Barki Lambs under different environmental conditions. On the other hand, Brown and Sabin (1961) working on Hampshire lambs, Kassab and Karam (1961), on Barki lambs, found that sex differences in this trait were non-significant

The effect of age of dam on weaning weight of lambs indicates that lambs born from dams ranging from >2.5 to

over 4.5 years of age recorded heavier weights at weaning than those born from dams aged from 1.5 to 2.5 years (Table 6). On the other hand, the highest weaning weight was recorded for lambs produced by dams of > 2.5-3.5 years of age, while the lowest weight was recorded for lambs born by dams of 1.5 years of age. Sidwell et al.(1964), Dahman (1966) and El-Tawil et al. (1970), working on different breeds of sheep, found that two year old ewes weaned lambs with lighter weights than mature ones. They also reported that weaning weights of lambs born to ewes of 4.5 years old were the heaviest when compared with lambs born to ewes of different age groups. The age of dam effect (Table 7) accounted for 7.35% of the total variance in this trait. Similar results were rported on the same breed under different conditions by Fahmy et al. (1969), Aboul-Naga et al. (1972), and El-Kouni et al.(1974). Fahmy et al. (1969) reported that age of dam accounted for 16.7% of the total variance in weaning weight of Barki sheep, while Aboul-Naga et al.(1972) reported an estimate of only 4.5% for the same bread.

Like that of birth weight the effect of weight of dam at mating on weaning weight of lambs was non-significant and did not account for any percentage of the total variance in this trait (Table 7).

3- Daily gain from birth to weaning.

The least squares constants; standard errors and the test of significance between constants as well as the percentage of variation due to each factor influencing pre-weaning daily gain are presented in Tables 8 and 9.

The overall mean of pre-weaning daily gain of Barki lambs was 137 gm. (Table 8). This estimate compares favourably with that of 124 gm. reported, for the same breed, by Fahmy et al. (1969). The average pre-weaning daily gain for the experimental farm was significantly higher than that of the commercial one (150 vs. 124 gm. day), Table 8. This is consistent with results obtained for weaning weight. The farm accounted for 25.86 % of the total variance in this trait (Table 9). The better management practiced in the experimental farm as compared with that of the commercial one, may explain such difference.

The average pre-weaning daily gain recorded for male lambs was significantly higher than that of the females (144 vs. 130 gm); Sex accounted for 6.90% of the total variation in this trait. Similar results were alsc reported by Fahmy et al. (1969). They found that the average pre-weaning daily gain of male and female Barki lambs were 123 and 115 gm., respectively.

Table (8): Least squares constants, standard errors (S.E) and Duncan multiple range test (DMRT) of differences between constants for daily gain from birth till weaning(kg.)

Classification	No.	Constants,S.E	DMRT
General means	195	0.137 ± 0.002	
Farm			
Experimental	104	0.013 ± 0.002	a
Commercial	91	-0.013 ± 0.002	b
Sex			
Male	100	0.007 ± 0.002	a
Female	95	-0.007 ± 0.002	b
Age of dam			
1.5 yrs	46	-0.013 ± 0.004	a
>1.5 - 2.5 yrs	66	-0.008 ± 0.004	ac
>2.5 - 3.5 yrs	29	0.011 ± 0.004	b
>3.5 - 4.5 yrs	33	0.006 ± 0.004	b
> 4.5 yrs	21	0.004 ± 0.005	bc
Weight of dam			
25 - 35 kg	70	-0.004 ± 0.003	a
36 - 40 kg	75	0.003 ± 0.003	a
> 40 kg	50	0.001 ± 0.003	a

Constants within the same classification having the same letter do not differ significantly from each other.

Table (9): Least squares analysis of variance of different factors affecting daily gain from birth-to weaning.

S.O.V.	D.F.	M.S.		V %
Farm	1	0.0199	**	25.86
Sex	1	0.0080	**	6.90
Age of dam	4	0.0033	**	6.90
Weight of dam	2	0.0007		0.00
Residual	186	0.0007		60.34

** $P < 0.01$

V%, Percentage of variance components.

Average pre-weaning daily gain of lambs increased with the advancement of age of their dams untill they were > 2.5-3.5 years old, after which pre weaning daily gain decreased with the advancement of age of dam (Table 8). Age of dam effect on pre-weaning daily gain was highly significant ($P < 0.01$) and accounted for 6.90% of the total variance in this trait (Table 9). Similarly, Fahmy et al. (1969) found that age of dam effect on pre weaning daily gain was highly significant. They added that the lowest and highest pre-weaning daily gain were for lambs born to dams aged 2-years and over 4 years old, respectively.

The average pre-weaning daily gain of lambs born to medium sized dams (36-40 kg) was significantly slightly higher than that of lambs born to smaller (25-35 kg) or larger dams (> 40 kg) (Table 8). The effect of weight of dams at mating on pre-weaning daily gain of lambs was not significant and did not account for any percentage in the total variance in this trait (Table 9).

4- Weight at 6 months of age:

The overall mean of 6-months weight of Barki lambs of this work was 23·75 kg. (Table 10).

Table (10): Least squares constants, standard errors (S.E) and Duncan multiple range test (DMRT) of differences between constants for 6 month weight of Barki lambs(kg.)

Calssification	N	Const. ± S.E	
General mean	194	23.75 ± 0.301	
Farm			
Experimental	103	1.80 ± 0.361	a
Commercial	91	- 1.80 ± 0.361	b
Sex			
Male	99	1.22 ± 0.286	a
Female	95	- 1.22 ± 0.286	b
Age of dam			
1.5 yrs	46	- 1.55 ± 0.614	a
>1.5 - 2.5 yrs	66	- 0.82 ± 0.499	ac
>2.5 - 3.5 yrs	29	1.82 ± 0.634	bd
>3.5 - 4.5 yrs	33	0.93 ± 0.616	bc
> 4.5 yrs	20	- 0.38 ± 0.775	acd
Weight of dam			
25 - 35 kg	70	- 0.87 ± 0.466	a
36 - 40 kg	75	0.32 ± 0.400	a
> 40	49	0.55 ± 0.459	a

Constants within the same classification having the same letter do not differ significantly from each other.

Table (11): Least squares analysis of variance of different factors affecting 6 month weight of Barki lambs

S.O.V.	D.F.	M.S.		V%
Farm	1	359.1213	**	24.62
Sex	1	264.4453	**	11.18
Age of dam	4	61.0063	**	5.69
Weight of dam	2	25.5756		0.86
Residual	185	14.5199		57.65

** $P < 0.01$

V%, Percentage of variance components.

The average 6-month weights (Table 10) of Barki lambs at 6 months old in the experimental and commercial farms were 25.55 and 21.95 kg., respectively. Once again, the difference between both farms of 3.60 kg. may be explained on the basis of difference between both farms in management. Farm effect on 6-month weight (Table 11) was highly significant ($P < 0.01$) and accounted for 24.62% of the total variance in this trait.

As expected, 6-month weight of male lambs was on the average higher than that of female ones (24.97 VS. 22.53 kg). Such difference (Table 11) was highly significant (P 0.01) and accounted for 11.18% of the total variance in this trait.

Ewes of > 2.5-3.5 years old) produced significantly heavier lambs at 6 months old than younger ewes of (1.5-> 1.5-2.5) while ewes 1.5 years old produced lighter lambs of the same age. Table (10). The difference in 6-month weight of lambs due to age of dam effect was highly significant ($P < 0.01$) and accounted for 5.69% of the total variance in this trait.

Similar to what was found previously, on the effect of dams weight on lambs' weights at previous stages, the

effect of weight of dam at the start of mating on 6-month weight of lambs was non-significant and accounted for only 0.86% of the total variance for this trait(Table 11).

5- Daily gain from weaning to 6 months old:

The least squares constants, standard errors and the test of significance between constants as well as the percentage of variation due to each factor influencing post weaning daily gain are presented in Tables 12 and 13.

The overall mean of post-weaning daily gain(Table 12) during the period from 4 to 6 months of age of Barki lambs was 65 gm. Comparing both pre-weaning and post-weaning stages, it is realised that a drop in lambs growth took place just after weaning (137 VS. 65 gm). The situation is expected since it is well known that lambs usually suffer a check in their growth after weaning. Fahmy et al.(1969) studied daily gain in Barki lambs and reported values of 124 and 57 gm. for the periods from birth to weaning and weaning to yearling (18 months old), respectively.

Table (12): Least squares constants, standard errors (S.E) and Duncan multiple range test (DMRT) of differences between constants for daily gain from 4 to 6 months age (kg).

Classification	No.	Const. ± S.E.	DMRT
General mean	194	0.065 ± 0.002	
Farm			
Experimental	103	0.002 ± 0.003	a
Commercial	91	- 0.002 ± 0.003	a
Sex:			
Male	95	0.006 ± 0.002	a
Female	99	- 0.006 ± 0.002	b
Age of dam			
1.5 yrs	46	0.001 ± 0.005	ab
>1.5 - 2.5 yrs	66	0.006 ± 0.004	a
>2.5 - 3.5 yrs	29	0.004 ± 0.005	ab
>3.5- 4.5 yrs	33	0.003 ± 0.005	ab
> 4.5 yrs	20	- 0.014 ± 0.005	b
Weight of dam			
25-35 kg	70	- 0.006 ± 0.004	a
36-40 kg	75	0.000 ± 0.003	a
> 40 kg	49	0.006 ± 0.003	a

Constant within the same classification having the same letter do not differ significantly from each other.

The average post-weaning daily gain from weaning to 6-months of age for Barki lambs raised in the experimental farm (Table 12) was not significantly different from that of those raised in the commercial farm (67 VS. 63 gm). This is in agreement with the fact that the growth of the lamb is more sensitive to the management condition in the ealier stages of life than in the later ones (Spedding 1965).

In the post-weaning stage (Table 12) male lambs exceeded significantly ($P < 0.05$) female ones in live-body weight gain (71 VS. 59 gm). Sex (Table 13) accounted for 5.10% of the total variation in this trait. This is due to differences in the gentic constitution between males and females. Similar results were also reported by Fahmy et al. (1969) on Barki sheep raised under desert conditions.

Age of dam (Table 13) did not affect significantly Post-weaning gain of lambs and accounted for only 2.04% of the total variation in this trait. This is expected because the maternal effect of dams on the growth of their lambs diminishes after weaning. Fahmy et al (1969) found that age of dam effect on daily gain of lambs from weaning to yearling was not significant.

Table (13): Least squares analysis of variance for the different factors affecting daily gain from 4 to 6 months old.

S.O.V.	D.F.	M.S.	V%
Farm	1	0.0006	---
Sex	1	0.0056 *	5.10
Age of dam	4	0.0016	2.04
Weight of dam	2	0.0017	1.02
Residual	185	0.0009	91.84

* $P < 0.05$

V% , percentage of variance components.

The average daily gain of lambs from 4 to 6 months of age (Table 12) was not significantly affected by weight of dams at mating. Body weight of ewes (Table 13) explained **that only 1.02% of the total variance in post-weaning gain of lambs is du to it.**

6- Daily gain of lambs from birth to 6 months of age.

The least squares constants, standard errors and the test of significance between constants as well as the percentage of variation due to each factor influencing daily gain from birth to 6 months are presented in Table 14. Results of the analysis of variance for the same data are presented in Table 15.

The overall mean of daily gain for Barki lambs was found to be 113 gm. with significant differences among both farm (123 VS. 103 gm) in favour of the Experimental one. Farm accounted for 24.64% of the total variance in this trait. The relatively good management practised in the Experimental **farm** , as compared to the commercial one, may explain such difference.

The average daily gain recorded for male lambs was significantly higher than that for females(119 VS.107 gm. day). Sex accounted for 10.14% of the total variation in this trait.

Table (14): Least squares constants, standard errors (S.E) and Duncan multiple range test (DMRT) of differences between constants for daily gain of Barki lambs from Birth to 6 months of age(kg).

Classification	No.	Const. ± S.E.	DMRT
General mean	194	0.113 ± 0.002	
Farm			
Experimental	103	0.010 ± 0.002	a
Commercial	91	- 0.010 ± 0.002	b
Sex			
Male	95	0.006 ± 0.001	a
Female	99	- 0.006 ± 0.001	b
Age of dam			
1.5 yrs	46	- 0.008 ± 0.003	a
>1.5 - 2.5 yrs	66	- 0.003 ± 0.003	ac
>2.5 - 3.5 yrs	29	0.009 ± 0.003	bd
>3.5 - 4.5 yrs	33	0.005 ± 0.003	bc
> 4.5 yrs	20	- 0.003 ± 0.004	acd
Weight of dam			
25 - 35 kg	70	- 0.005 ± 0.002	a
36 - 40 kg	75	0.002 ± 0.002	a
> 40 kg	49	0.003 ± 0.002	a

Constants within the same classification having the same letters do not differ significantly from each other.

Table (15): Least squares analysis of variance of the different factors affecting daily gain of Barki lambs from Birth to 6 months of age.

S.O.V.	D.F.	M.S.	V%
Farm	1	0.0101 **	24.64
Sex	1	0.0067 **	10.14
Age of dam	4	0.0016 **	5.80
Weight of dam	2	0.0007	1.45
Residual	185	0.0004	57.97

** $P < 0.01$

V%, Percentages of variance component.

Average daily gain of lambs increased with the advancement of age of their dams from 1.5 up to >2.5-3.5 years old, after which daily gain decreased till ewes reached > 4.5 years old. Thus, age of dam affected significantly ($P < 0.01$) this trait and accounted for only 5·80% of the total variance. (Table 15).

Average daily gain of lambs (Table 14) born to heavier dams(> 40 kg) was slightly higher, than that of lambs born to medium (36-40 kg) or smaller ones (25-35 kg). However, differences were not significant, weight of dam accounted only for 1.45% of the total variance in this trait.

D- Feed Intake for Ewes and Lambs.

Feed consumed by both experimental and commercial farms was measured for twelve months. Thus, feed was weighed to obtain values consumed to enable calculating the "BEMP" in both flocks.

Results in Table (16) show feed consumed as classified by farms and physiological status of the animal experessed in terms of dry matter (DM) and total digestible nutrients (TDN), as well as feed consumed by their lambs from 4-6 months of age.

During mating and pregnancy periods, individual dry matter intake was almost equal for experimental and commercial farms (1.169 VS. 1.113 kg/ewe/day). On TDN basis, the feed consumption of the experimental farm was higher by almost 2.5 folds than that of the commercial one (0.611 VS. 0.233 kg/ewe/day) due to the relatively high concentrate content of the experimental farm diet. Hassan (1976) found that TDN requirements for the same breed were 543.5 and 675.8 gm/ewe/day in early and late pregnancy, respectively. Results of the present work indicate that, ewes of the experimental

Table (16): Feed consumed (kg.) by both flocks over 12 months.

Period	Animal	Experimental		Commercial	
		D.M.	T.D.N.	D.M.	T.D.N.
1-7-80 to 15-12-1980 Mating & Pregnancy	Ewes	28604.36 (1.169)	14945.56 (0.611)	28363.58 (1.113)	5932.50 (0.233)
16-12-80 to 30-3-1981 Lactation	Ewes	15716.72 (1.082)	8538.05 (0.588)	12635.98 (0.830)	5979.96 (0.393)
1-4-81 to 30-6-1981 Dry period	Ewes	9618.52 (0.795)	5143.54 (0.425)	8154.50 (0.676)	4505.14 (0.373)
Total	Ewes	53939.60	28627.15	49154.06	16417.60
1-4-81 to 30-6-1981	Lambs*	5679.95 (0.603)	3076.90 (0.327)	4141.75 (0.500)	2287.65 (0.276)
Grand total	Ewes + Lambs	59619.55	31704.05	53295.81	18705.25

Figures in parentheses represent daily feed intake/animal

D.M, dry matter.

T.D.N., Total digestible nutrients.

* Feed consumed by lambs from 4-6 months of age.

farm have covered their requirements while those of the commercial one were below the levels (120 and 150% of maintenance requirement during the first 3 months (at 2 month of pregnancy) recommended by Hassan (1976) due to the fact that the commercial farm was only allowed to graze forages during mating and pregnancy. The experimental farm, however, was offered adequate amounts of concentrates and hay.

Likewise, during lactation average feed intake of the experimental farm exceeded that of the commercial one by about 49% on TDN basis (Table, 16).

During the dry period (after weaning) the experimental farm exceeded also the commercial one by about 14% in average TDN intake.

Thus, it appears that the feeding level of the experimental farm was higher than that of the commercial one in all stages of the reproductive cycle. The same applies to the lambs from both farms which may explain part of the superiority of lambs born in the experimental farm as compared to those born in the commercial one.

E. Evaluation of Biological efficiency of meat production

Large (1970) defined the "BEMP" as the product output per unit of food input. Product output may be expressed as the amount of carcass, or the amount of edible meat, or as the energy or protein content of either of these or of the whole body weight. Food input may be expressed as dry matter (DM), digestible organic matter (DOM) or as the energy or protein content of either the DM or the digestible portion.

The cost of kg gain in body weight expressed as the amount of DM, and TDN required to produce one kg gain in both farms in the present study are shown in Table 17.

In terms of number of kg D.M./ kg gain, the experimental farm produced one kg for every 22.7 kg. D.M. consumed. The corresponding value for the commercial farm was 27.0 kg, showing a difference between both farms (4 kg) in this respect.

This was mainly due to many factors among which is the higher productivity of lambs in the experimental farm compared to the commercial one (79.5 VS. 68.9 lambing %).

Table (17): Biological efficiency of meat production for both experimental and commercial farms

Item	Experimental farm	Commercial farm
Kg. D.M./kg body weight	22.7	27.0
Kg. T.D.N./kg body weight	12.0	9.3

Due to the fact that the concentrate represented 39.6 and 25.3% on the average of the total ration for the experimental and commercial farms , respectively, the latter flock exceeded the former in "BEMP" when the value was expressed as kg TDN (Table, 17).