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# EFFECTS OF SOME ENVIRONMENTAL FACTORS ON BODY AND FLEECE WEIGHTS OF BARKI SHEEP

BY

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## SUMMARY

The effects of some environmental factors on body and fleece weights of Barki sheep were studied. These factors were sex, year, season of lambing and age of dam. The lambs were born during the period 1953 to 1959. Lambs born in November, December and January were called winter born and those born in February, March and April were called spring born. Ewes with more than one lambing were considered mature.

There were 217, 160, and 126 lambs available for birth, weaning and yearling body weights. The average weights were 2.65, 18.90 and 29.55 kilograms, respectively. Year of birth affected body weights significantly at all ages. The effect of sex and season did not become statistically significant until the lambs were one year of age. Lambs out of mature ewes were heavier than those out of two-year-old ewes, but the differences were not significant.

Fleece weight increased with age. Sex differences at one and two years of age were not statistically significant. Season of lambing was an important source of variation among yearling fleeces only. Spring born lambs tended to shear heavier fleeces than winter born ones. Years were also an important source of variation. Age of dam had little effect on fleece weights of rams and ewes.

The phenotypic correlations among body weights and between yearling body and fleece weights were calculated.

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## INTRODUCTION

The home of the Barki sheep is Libya. Its name is given after Barkah, the eastern province of Libya. It is sometimes called Dernawi, after Dernah, in the state of Barkah. In Egypt it is found in the Northwestern desert and in some of the cultivated areas bordering the desert, in Beherah and Fayoum provinces. Whether raised in the desert or on a farm they are an important source of wool and lamb for Egypt.

In the present investigation, some of the environmental factors affecting body and fleece weights of Barki sheep raised under farm conditions were studied. These factors were sex, year, season of lambing and age of dam. The correlations between body weights at different ages and between yearling body and fleece weights were also calculated. Knowledge of the effects of environmental factors on economic characters and the correlations among them are important for efficient selection programs.

## MATERIALS AND METHODS

In April, 1953, forty-two ewes and three rams of the Barki sheep were brought to the Experimental Farm of the College of Agriculture. They were bought from El-Hammam, in the desert west of Alexandria. It is the largest market of Barki sheep and therefore they were considered a representative sample of the breed. The animals were fed on Berseem (*Trifolium alexandrinum*), which is available from November until May. In the summer they grazed in the fields and were given concentrates which consisted usually of one part undecorticated cotton seed cake and one part rice bran. These conditions are similar to those of most farm flocks.

The ewes were bred a few weeks after they were brought to the station, allowing them to lamb in the winter of 1953. From then on the rams were left with the ewes all the year around until 1958, when the rams were separated from the flock in July and August of each year. This practice allowed most of the ewes to lamb from November until April. Only a small number of them lambed outside this range. Lambs born during November, December and January are referred to as winter

born and those born in February, March and April are referred to as spring born lambs. The spring lambings were almost twice as much as those of the winter months. Only single born lambs were used in the present study. This is because twinning percentage was very low and most of the twins were spring born (Table 1).

TABLE 1  
Number of lambs born and lambing percentage for the different months  
of the Spring and Winter seasons

Spring			Winter		
Month	No. of lambs born	Lambing %	Month	No. of lambs born	Lambing %
February . . . . .	58	107.4	November . . . . .	17	100.0
March . . . . .	128	108.4	December . . . . .	27	100.0
April . . . . .	33	110.0	January . . . . .	30	103.4
Total . . . . .	219	108.8	Total . . . . .	74	101.3

Efforts were made to avoid inbreeding as much as possible but in some cases this was unavoidable. No correction was made for such cases.

Lambs were weighted within 24 hours of birth, to the nearest 0.1 kg., and then at monthly intervals. Weights at 4 and 12 months were considered as weaning and yearling weights, respectively.

The first shearing is done when the animals are about one year of age. Later shearings are at six months intervals; during the first week of April and during the first week of October. The animals are washed four days before they are shorn by hand shears. The yearly fleece weight was taken as a unit. Therefore, fleeces other than that of the first year were the result of adding two shearings. Data were available on ewes up to three years of age and on rams up to two years only.

The analysis of variance was carried out as given by Snedecor (1946). Males were compared with females over all years and seasons. Years were compared within sex and seasons were compared within sex and

years. The effect of age of dam on body and fleece weights was studied separately because the number of lambs with dams of known age was smaller. The dams were classified into two-year-old and mature or older ewes. This was done because ewes are usually fully grown when they are about two years old. Also because the number of ewes within each age group was small.

The phenotypic correlations were calculated within sex, year and season of lambing.

## RESULTS AND DISCUSSION

### *Body Weights :*

The average birth, weaning and yearling body weights of lambs studied were 2.65, 18.90 and 29.55 kilograms, respectively. The analysis of the different sources of variation for body weights at the different ages is presented in Table 2. Year of birth affected body weights significantly at all ages. The effect of sex and season did not become statistically significant until the lambs were one year of age.

TABLE 2

Analysis of variance for birth, weaning and yearling weights

Source of variation	Birth weight		Weaning weight		Yearling weight	
	d.f.	Mean squares	d.f.	Mean squares	d.f.	Mean squares
Total .....	216	0.361	159	22.70	125	36.79
Sex .....	1	0.009	1	17.17	1	350.73**
Year within sex..	12	1.095**	12	42.99*	10	157.81**
Season within year and sex	7	0.245	7	33.53	6	121.73**
Within season...	196	0.321	139	20.44	108	17.96

\* P less than 0.05

\*\* P less than 0.01

*Sex :*

Table 3 presents means, standard deviations and coefficients of variability for weights of ram and ewe lambs classified according to season of lambing. At birth, sex differences were very little and insignificant. In the winter season males were heavier than females but in the spring the females were somewhat heavier. It is generally known that male lambs are always heavier at birth than females (Donald and McLean, 1935; Bonsma, 1939; Underwood *et al.*, 1943; Badreldin, 1951; Asker *et al.*, 1952; Alexander, 1955; and Karam, 1955). At weaning and at one year of age ram lambs were heavier than ewe lambs and the differences were more pronounced at 12 months than at four months. Similar results were reported by Donald and McLean (1935), Bonsma (1939), Phillips and Brier (1940), Ensminger *et al.* (1943), Hazel and Terril (1945, 1946 *a*, 1946 *b*), Terrill *et al.* (1947, 1948 *a*, 1948 *b*), Sidwell and Grandstaff (1949), Morley (1950), Asker *et al.* (1952), Ragab *et al.* (1953 *a*), Blackwell and Henderson (1955) and Karam (1959 *b*).

TABLE 3

Means, Standard deviations, and Coefficients of Variability  
for Birth, Weaning and Yearling Weights  
of Spring and Winter Born Lambs.

Sex	Spring				Winter			
	No.	Mean	S.D.	C.V. %	No.	Mean	S.D.	C.V. %
Birth weights								
Rams . . . . .	81	2.59	0.43	16.75	32	2.78	0.52	18.95
Ewes . . . . .	76	2.64	0.57	21.68	28	2.70	0.57	20.96
Weaning weights								
Rams . . . . .	63	19.95	5.49	27.54	19	16.78	4.22	25.17
Ewes . . . . .	64	18.95	4.16	21.95	14	16.78	2.88	17.30
Yearling weights								
Rams . . . . .	41	31.31	7.71	24.63	17	31.47	6.00	19.06
Ewes . . . . .	48	29.41	5.38	18.31	20	24.65	4.49	18.24

TABLE 4  
Effect of Year on Birth, Weaning and Yearling weights of Spring and Winter born lambs.

Year	Birth weight				Weaning weight				Yearling weight			
	Spring		Winter		Spring		Winter		Spring		Winter	
	No.	Av. (Kg.)	No.	Av. (Kg.)	No.	Av. (Kg.)	No.	Av. (Kg.)	No.	Av. (Kg.)	No.	Av. (Kg.)
1953.....	—	—	13	3.23	—	—	14	14.42	—	—	13	31.61
1954.....	4	3.62	—	—	12	20.16	2	16.50	6	37.33	1	25.00
1955.....	21	2.14	1	2.00	21	18.95	1	20.00	23	32.60	1	29.00
1956.....	34	2.71	—	—	24	19.95	—	—	25	31.08	—	—
1957.....	37	2.77	22	2.80	24	21.54	2	17.00	29	26.44	12	26.08
1958.....	16	2.71	18	2.63	15	16.53	14	18.92	6	28.00	10	25.00
1959.....	43	2.43	6	2.40	31	18.93	—	—	—	—	—	—
Total or mean	157	2.62	60	2.74	127	19.44	33	16.78	89	30.29	37	27.35

consequently they are in good condition at lambing time. Ewes lambing in the winter season take some time to recover from the unfavorable summer conditions which cover most of their gestation period. This is reflected in the production of milk during a large part of the suckling period.

After weaning, and during the summer months, spring born lambs make little gain until they are about nine months old. After that the new berseem is available and they start growing at faster rates until the age of 12 months. Winter born lambs are weaned during berseem season. They continue growing fast until they are about eight months of age and they are heavier than spring born ones. From then on, summer conditions prevail and little gains are made until 12 months of age when they are surpassed by the spring lambs again (Tables 5, 6).

TABLE 5

Monthly body weights (kg.) of Spring born lambs.

Age in Months	Rams		Ewes	
	No.	Average weight	No.	Average weight
Birth	81	2.59	76	2.64
1	50	10.04	47	8.82
2	47	14.51	49	13.40
3	44	18.40	54	16.87
4	63	19.95	64	18.95
5	49	21.28	56	20.98
6	49	19.73	59	21.59
7	51	23.33	59	22.86
8	46	23.84	57	22.17
9	44	25.31	56	23.19
10	44	25.86	51	23.56
11	36	29.36	44	26.11
12	41	31.31	48	29.41



TABLE 6  
Monthly body weights (kg.) of winter born lambs.

Age in Months	Rams		Ewes	
	No.	Average weight	No.	Average weight
Birth	32	2.78	28	2.70
1	32	8.59	22	8.77
2	33	11.81	23	11.78
3	21	14.61	16	13.81
4	19	16.78	14	16.78
5	27	19.92	22	17.27
6	28	23.39	20	19.20
7	28	26.46	24	21.91
8	29	28.79	24	23.37
9	30	28.33	23	22.17
10	30	28.03	25	22.48
11	22	29.22	24	22.79
12	17	31.47	20	24.65

Hammond (1932) and Donald and McLean (1935) reported that birth weights of lambs increase with the advance of the lambing season. This is due to the improved conditions of their mothers at lambing time. Similar conclusions were made by Asker *et al* (1954) and Karam (1959 *b*).

Bonsma (1939) and Wallace (1948) reported a strong correlation between milk yield of ewes and growth rate of lambs, especially before weaning. Vigor, growth, and development of lambs depend mainly on the milking ability of ewes as well as on the amount of food available for lambs. Similar results were arrived at by other investigators (Asker *et al.*, 1954; Blackwell and Henderson, 1955; and Karam, 1959 *b*).

Karam (1959 *b*) proposed detailed studies to investigate the causes of slow growth of lambs during summer months known for high temperature, humidity and parasite and disease activity. He suggested that

lambing in March, April and May should be recommended only to those who can afford dry-lot feeding or can grow green fodder in the summer. Lambs should be marketed by eight months of age. Winter born lambs can be sold off berseem or soon after. Spring born lambs can be put on a fattening ration right after weaning and sold around that age, too. This is done to avoid keeping the lambs during the unfavourable summer months until new berseem is available.

*Age of dam :*

The results in Table 7 show that, within sex, lambs out of mature ewes were heavier than those out of two-year-old ewes. The differences were small at birth and they increased with the advance of age, at weaning and at 12 months of age. Although they lacked statistical significance, they were in the same direction as those reported by Bonsma (1939), Kincaid (1943), Hazel and Terrill (1945, 1946 *a*), Terrill *et al.* (1947, 1948 *a*, 1948 *b*), Sidwell and Grandstaff (1949), Asker *et al.* (1952), Judin and Brigis (1952), Brigis (1953), Blackwell and Henderson (1955), and Karam (1955, 1959 *b*). Several of these authors also found that age of dam was not one of the important sources of variation affecting weights of lambs. Karam (1955) attributed some of these differences to the effect of selection.

TABLE 7  
Effect of age of dam on birth, Weaning and Yearling weights.

Age of Dam and Lamb group	Birth		Weaning		Yearling	
	No.	Av. wt. (kg.)	No.	Av. wt. (kg.)	No.	Av. wt. (kg.)
Two years old :						
Rams .....	12	2.52	8	19.62	6	30.33
Ewes .....	19	2.58	18	18.00	12	25.50
Mature :						
Rams .....	62	2.80	60	20.41	57	32.21
Ewes .....	59	2.79	60	18.53	56	28.26

*Fleece Weight :*

Lambs vary considerably in their ages when they are shorn for the first time. Therefore fleece weights were adjusted to 365 days, using regression coefficients of fleece weight on age for each sex. They were .0007 and .001 for ram and ewe lambs, respectively. No other adjustments were necessary for later shearings since they were made at six month intervals with very little variation.

*Age :*

Fleece weight of ewes increased until three years of age (Table 8). The table also shows that among rams the second years' fleece was heavier than that of the first year. Fleece weight usually increases with age in a curvilinear manner reaching its maximum by three to four years (Terrill *et al.*, 1950 ; Maymone *et al.*, 1956 ; and Karam, 1959 *a*). Karam and Ragab (1959) found that fleece weight of the second year was heavier than that of the first in the Texel sheep of Holland. Records should be corrected for the effect of age comparing rams or ewes with different numbers of shearings.

*Sex :*

Table 8 presents means, standard deviations and coefficients of variability for fleece weights of rams and ewes. They are classified according to age (1 to 3 in ewes and 1 to 2 in rams), and season of birth. Fleece weight of yearling ewes was slightly heavier than that of yearling rams. At the second year of age rams exceeded ewes among spring born ones and it was the other way around among winter born ones. All differences were statistically insignificant. Hazel and Terrill (1946 *b*), Terrill *et al.* (1947, 1948 *a*, 1948 *b*), Morley (1950), Kyle and Terrill (1953), Ragab *et al.* (1956), Karam (1959 *a*) and Karam and Ragab (1959) reported that rams produced heavier fleeces than ewes.

*Year :*

The average fleece weights of rams and ewes, classified by year of birth, are given in Table 9. Differences in fleece weights from one year to

TABLE 8

Means, standard deviations, and coefficients of variability for fleece weights of Spring and Winter born Rams and Ewes of different ages.

Age and Sex group	Spring born				Winter born			
	No.	Mean Kg.	S.D.	C.V. %	No.	Mean Kg.	S.D.	C.V. %
First Year :								
Rams . . . . .	71	0.74	0.20	27.23	33	0.76	0.13	22.85
Ewes . . . . .	70	0.84	0.18	21.21	28	0.81	1.18	21.49
Second Year :								
Rams . . . . .	34	1.32	0.45	34.09	11	0.97	0.14	14.87
Ewes . . . . .	37	1.20	0.32	26.31	8	1.25	0.15	12.00
Third Year :								
Ewes . . . . .	26	1.51	0.36	23.92	3	1.67	0.38	22.74

TABLE 9

Effect of year of birth on fleece weights of rams and ewes of different ages.

Age in years	Rams				Ewes					
	1		2		1		2		3	
Year of birth	No.	Average (Kg.)	No.	Average (Kg.)	No.	Average (Kg.)	No.	Average (Kg.)	No.	Average (Kg.)
1953	10	0.91	10	0.94	5	0.92	5	1.18	3	1.67
1954	7	0.92	6	0.98	7	0.98	7	1.25	4	1.62
1955	9	0.52	7	1.86	12	0.58	5	1.67	9	1.60
1956	13	0.82	13	1.51	17	0.81	15	1.26	7	1.56
1957	27	0.73	8	0.78	21	0.80	9	0.78	6	1.22
1958	18	0.71	1	1.20	16	0.79	4	1.36	—	—
1959	20	0.60	—	—	20	0.99	—	—	—	—

another are usually associated with variations in feeding, health and weather conditions. Age of dams and the genetic make-up of the flock also affect these differences. Table 10 shows that yearly variations in fleece weight were statistically highly significant at all ages, except for three year old ewes. Hazel and Terrill (1946 *b*), Terrill *et al.* (1947, 1948 *a*, 1948 *b*), Price *et al.* (1953), Blackwell and Henderson (1955), Karam and Ragab (1959) and Karam (1959 *a*) found that yearly differences were the most important environmental source of variation in fleece weight.

*Season of lambing :*

At the first shearing, spring born ewes sheared more wool than winter born ewes and the difference was statistically highly significant (Table 10). Spring born ewes were also heavier at 12 months of age. This may account for the extra amount of wool sheared since yearling body and fleece weight are positively correlated as will be shown later. For the second year of age, winter born ewes sheared a little more than spring born ones but the difference was not significant. At the third year of age it was not possible to compare seasons because they were completely confounded with years.

Yearling spring born rams also sheared more wool than those born in the winter and the difference was highly significant (Table 10). At the second year of age no comparison for seasons within year was available. Coop (1953) found a strong correlation between rate of wool growth and atmospheric temperature; wool growth having its maximum in midsummer and its minimum in midwinter. Dorosenko (1954) observed an increase in fleece weight during a season when favorable conditions were present. Karam (1959 *a*) reported that winter born ewes sheared more wool at all ages than summer born ones and they were also heavier at 12 months of age.

*Age of dam :*

The effect of dams' age on fleece weight of their lambs is shown in Table 11. Rams and ewes from mature dams produced heavier fleeces than those from two-year-old dams, at one, two, and three years of age, but the differences were not statistically significant. Hazel and Terrill

TABLE 10

Analysis of variance for fleece weight of ewes and rams at different ages.

Age in Years	Rams						Ewes									
	1			2			1			2			3			
	D.F.	M.S.		D.F.	M.S.		D.F.	M.S.		D.F.	M.S.		D.F.	M.S.		
Source of variation...																
Total .....	103	0.036	44	0.179	97	0.032	44	0.085	28	0.128						
Year.....	6	0.284**	5	1.314**	6	0.241**	5	0.558**	4	0.183						
Season within Year.	3	0.103**	—	—	5	0.052**	2	0.004	—	—						
Within Season....	94	0.018	39	0.033	86	0.016	37	0.025	24	0.119						

\*\* P less than 0.01.

(1946 *b*) and Terrill *et al.* (1947, 1948 *a*, 1948 *b*) reported that lambs out of mature ewes produced heavier fleeces than those out of two-year-old ewes.

TABLE 11

Effect of age of dam on fleece weights of rams and ewes of different ages.

Age of Dam and Animal Group	First Year		Second Year		Third Year	
	No.	Average (Kg.)	No.	Average (Kg.)	No.	Average (Kg.)
Two-Years-Old :						
Rams .....	6	0.63	4	1.20	—	—
Ewes .....	8	0.72	4	1.07	3	1.13
Mature :						
Rams .....	37	0.75	24	1.25	—	—
Ewes .....	38	0.82	25	1.20	22	1.44

#### *Correlation Coefficients :*

Body and fleece weights are important characters affecting the breeders income from his sheep enterprise. Knowledge of the relationships among them is important for effective selection programs. Birth and weaning weight can be used as early criterions for yearling weight if they are correlated to a reasonable degree with it. This is done whenever selection has to be done at an earlier age.

The different correlation coefficients are presented in Table 12. Birth and weaning weights had a correlation value of .293. This is lower than estimates of .41 and .59 obtained by Bonsma (1939) and Ragab *et al.* (1953 *b*), respectively. Meanwhile, it is similar to the estimate (.25-.33) found by Glembockii and Bogoljubova (1940) and higher than that (.212) found by Karam (1959 *b*). The correlation between birth and yearling weight was .290. Similar estimates reported by Glembockii and Bogoljubova (1940) and Karam (1959 *b*); .26-.29, .205, respectively. The correlation between weaning and yearling

weight was .227. Morley (1950), Terrill *et al.* (1950), Kyle and Terrill (1953), and Karam (1959 *b*) reported positive correlations ranging from .31 to .77 between weaning and yearling body weight.

Most workers agreed that the correlation between weaning and yearling weight is usually the highest and that between birth and yearling is usually the lowest. This was not the case in the present study because the correlation between weaning and yearling was lower than expected. The small number of observations available, or the relatively small coefficients of variability among yearling weights, might have been the cause for such discrepancy.

The correlation between yearling body and fleece weight was .046. This estimate is much lower than similar ones given by other investigators and ranging from .28 to .54 (Morley, 1950; Terrill *et al.*, 1950; and Karam, 1959 *c*). Such correlations are necessary for simultaneous selection for body and fleece weights.

TABLE 12  
Phenotypic Correlations.

Characters Correlated	No. of lambs	Correlations
Birth and Weaning Weight .....	111	0.293 ± 0.001
Birth and Yearling Weight .....	110	0.290 ± 0.001
Weaning and Yearling Weight .....	100	0.227 ± 0.004
Yearling Body and Fleece Weight .....	94	0.046 ± 0.010

#### REFERENCES

- ALEXANDER, G., McCANCE, I. and WATSON, R. H. (1955). Some observations on losses among Merino lambs. Age at death, birth weight, and duration of gestation of the lambs from one flock. *Aust. Vet. J.* 31 : 85.
- ASKER, A. A., RAGAB, M. T. and KADI, M. R. (1952). The influence of some environmental factors affecting weight of Ossimi and Rahmani sheep. *Fouad 1st. U., Faculty of Agric. Bull.* No. 19.
- , and BASTAWISY, A. E. (1954). Effect of season of lambing on body weight, measurements and mortality rate of lambs in Egypt. *Indian J. Vet. Sci. and Animal Husb.* 24 : 137.



- BADRELDIN, A. L. (1951). Growth and carcass percentage in Ossimi and Rahmani sheep. *Fouad 1st. U. Faculty of Agric. Bull. No. 3.*
- BLACKWELL, R. L. and HENDERSON, C. E. (1955). Variation in fleece weight, weaning weight and birth weight of sheep under farm conditions. *J. Animal Sci.* 14 : 831.
- BLUM, V. T. (1944). The influence of seasonal differences on the growth of Navajo lambs. *J. Animal Sci.* 3 : 41.
- BONSMAN, F. N. (1939). Factors influencing the growth and development of lambs, with special reference to cross-breeding of Merino sheep for fat-lamb production in South Africa. *U. Pretoria Publications, series : Agriculture No. 48.*
- BRIGIS, O. I. (1953). The effect of age of sires and dams on the stud and fur qualities of their progeny. *A. B. A. Vol. 22, No. 1, p. 51.*
- COOP, I. E. (1953). Wool growth as affected by nutrition and by climatic factors. *J. Agric. Sci.* 43 : 456.
- DONALD, H. P. and Mc LEAN, J. W. (1935). The growth rate of lambs in Canterbury. A preliminary study of variation in the growth rate of lambs in Canterbury. *New Zealand J. Sci. and Tech.* 17 : 497.
- DORSENKO, N. J. A. (1954). The effect of various times of lambing on the development and wool production of lambs. *A. B. A. Vol. 23, No. 2, p. 156.*
- ENSMINGER, M. E., PHILLIPS, R. W., SCHOTT, R. G. and PARSONS, G. H. (1943). Measuring performance of progeny of rams in a small flock. *J. Animal Sci.* 2 : 157.
- GLENBOCKII, Ja. L. and BOGOLJUBOVA G. V. (1940). The relation of the birth weight of lambs to their subsequent growth. *A. B. A. Vol. 10, No. 4, p. 257.*
- HAMMOND, J. (1932). Growth and development of mutton qualities in the sheep. Oliver and Boyd, Edinburgh.
- HAZEL, L. N. and TERRILL, C. E. (1945). Effects of some environmental factors on weaning traits of range Rambouillet lambs. *J. Animal. Sci.* 4 : 331.
- and — (1946a). Effects of some environmental factors on weaning traits of range Columbia, Corriedale and Targhee lambs. *J. Animal Sci.* 5 : 318.
- and — (1946b). Effects of some environmental factors on fleece and body characteristics of range Rambouillet yearling ewes. *J. Animal Sci.* 5 : 382.
- JUDIN, V. M. and BRIGIS, O. I. (1952). Changes in heritability and vitality of Karakul sheep due to age of parents. *A. B. A. Vol. 20, No. 3, p. 237.*

- KARAM, H. A. (1955). Effects of some environmental factors on birth weight in Rahmani sheep. The Second Arab Science Congress, Cairo U., Egypt.
- (1959 *a*). Fleece weight in the Rahmani sheep. *Alexandria J. Agric. Res.* 7 : 221.
- (1959 *b*). Birth, weaning and yearling weights of Rahmani sheep. I. Effects of some environmental factors. II. Heritability estimates and correlations. *Empire J. Exp. Agric.* 27 : 313.
- (1959 *c*). Selecting yearling Rahmani sheep. *J. Animal Sci.* 18 : 1452.
- and RAGAB, M. T. (1959). Fleece weight and fleece grade in the Texel sheep. *Alexandria J. Agric. Res.* 7 : 17.
- KINCAID, C. M. (1943). Influence of the sire on the birth weight of lambs. *J. Animal Sci.* 2 : 152.
- KYLE, W. H. and TERRILL, C. E. (1953). Heritabilities and repeatabilities of fleece and body traits of Rambouillet, Targhee and Columbia sheep born in 1951. *J. Animal Sci.* 12 : 896.
- MAYMONE, B., CARUSI, A. and MAOLI, G. (1956). Wool production in a flock of the improved Apulian breed. *A. B. A.* Vol. 25, No. 2, 169.
- MORLEY, F. H. W. (1950). Selection for economic characters in Merino sheep. *Ph. D. Thesis.* Iowa State College Library. Ames, Iowa.
- PHILLIPS, R. W. and DAWSON, W. M. (1940). Some factors affecting survival, growth and selection of lambs. *U. S. D. A. Circular* No. 538.
- and BRIER, G. W. (1940). Estimating weights of lambs at a constant age. *U. S. D. A. Circular* No. 541.
- , STOEHR, J. A. and BRIER, G. W. (1940). Growth in Corriedale and Rambouillet sheep under range conditions. *Proc. Amer. Soc. Anim. Prod.* 173.
- PRICE, D. A., SIDWELL, G. M. and GRANDSTAFF, J. O. (1953). Effects of some genetic and environmental factors on yearling traits of Navajo and Navajo crossbred ewes. *J. Animal Sci.* 12 : 697.
- RAGAB, M. T., ASKER, A. A. and YOUSSEF, A. A. (1953 *a*). Comparative study of body weight and measurements of Ossimi and Rahmani sheep. Cairo U., *Faculty of Agric., Bull.* No. 27.
- , — and KADI, M. R. (1953 *b*). Genetic factors affecting weights of Ossimi lambs. *Empire J. Exp. Agric.* 21 : 304.
- , — and GHONEIM, K. E. (1956). Effect of crossing two breeds of Egyptian sheep on wool characteristics. *Empire J. Exp. Agric.* 24 : 307.

- SIDWELL, G. M. and GRANDSTAFF, J. O. (1949). Size of lambs at weaning as a permanent characteristic of Navajo ewes. *J. Animal Sci.* 8 : 373.
- SNEDECOR, G. W. (1946). Statistical methods. The Iowa State College Press, Ames, Iowa.
- TERRILL, C. E., SIDWELL, G. M. and HAZEL, L. N. (1947). Effects of some environmental factors on yearling traits of Columbia and Targhee ewes. *J. Animal Sci.* 6 : 115.
- , — and — (1948 a). Effects of some environmental factors on yearling traits of Columbia and Targhee rams. *J. Animal Sci.* 7 : 181.
- , — and — (1948 b). Effects of some environmental factors on traits of yearling and mature Rambouillet rams. *J. Animal Sci.* 7 : 311.
- , KYLE, W. H. and HAZEL, L. N. (1950). Correlation between traits of range Rambouillet rams. *J. Animal Sci.* 9 : 640.
- UNDERWOOD, E. J., SHIER, F. L. and CARISS, H. G. (1943). Studies in sheep husbandry in W. A. IV. The influence of a high level of prenatal feeding in lamb production. *A. B. A.* Vol. 12, No. 3, p. 140.
- WALLACE, L. R. (1948). The growth of lamb before and after birth in relation to the level of nutrition. *J. Agric. Sci.* 38 : 93.

## الملخص

### تأثير بعض العوامل البيئية

### على وزن الجسم والصوف في الأغنام البرقى

درس تأثير الجنس والسنة وموسم الوضع وعمر الأم على كل من وزن الجسم ووزن الجزة في الأغنام البرقى المرباة في مزرعة كلية الزراعة جامعة الإسكندرية وشملت الدراسة الحملان التي ولدت في المدة من ١٩٥٣ - ١٩٥٩

وقد اعتبر أن الحملان التي ولدت في شهور نوفمبر وديسمبر ويناير هو المحصول الشتوى ، بينما يمثل محصول الربيع الحملان التي ولدت في فبراير ومارس وأبريل ، كما اعتبرت النعاج التي أعطت أكثر من حمل تامة النضج . وقد بلغ عدد الحملان عند الولادة ٢١٧ حملا مقابل ١٦٠ في عمر الفطام ، ١٢٦ حملا في عمر العام . وقد بلغ متوسط الوزن لهذه المجموعات ٢,٦٥ كجم ، ١٨,٩ كجم ، ٢٩,٥٥ كجم على التوالي .

وقد وجد أن للسنة تأثير معنوى على وزن الجسم في الأعمار الثلاثة سابقة الذكر . ولم يتضح أن هناك تأثير معنوى على وزن الجسم لكل من الجنس وموسم الوضع إلا عندما بلغت الحملان عمر العام .

هذا علماً بأنه اتضح أن الحملان التي كانت أمهاتها تامة النضج كانت أوزانها بصفة عامة أكبر من أوزان الحملان التي ولدت لنعاج أصغر وإن لم يكن الفرق معنوياً . أما بخصوص إنتاج الصوف فقد اتضح أن وزن الجزة يزيد كلما زاد العمر كما لم يتضح أن هناك أى تأثير للجنس في عمر سنة وسنتين .

أما بالنسبة لموسم الولادة فقد اتضح أنه أحد مصادر التباين الهامة في وزن الجزة ، فقد أعطت الحملان التي ولدت في الربيع صوفاً أكثر من التي ولدت في الشتاء بينما لم يكن هناك تأثير ما للسنة . أما عمر الأم فلم يكن له إلا أثر ضئيل على وزن الجزة في كل من النعاج والكباش .