

**BIRTH WEIGHT OF HUNGARIAN MERINO SHEEP  
IN NORTH-WESTERN COASTAL EGYPTIAN  
DESERT**

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The effects of year of birth, sex, age of dam and type of birth on birth weight of 249 Hungarian Merino lambs raised under desert conditions were studied. All the factors except sex, were found to have a highly significant effect. Type of birth was the most important factor in this regard. Heritability as estimated by paternal half-sib method was  $.32 \pm .20$ .

Hungarian Merino sheep has been imported and relocated in the Egyptian deserts since 1958. The main purpose for importation was to cross them with the native Barki sheep. Some of the animals were purely bred for continuing the crossbreeding program. In the present study the effect of some environmental factors on birth weight of purebred Merino lambs and the heritability estimate of this character were investigated.

**Material and Methods**

A total of 249 birth records were used to study the effect of year, sex, age of dam and type of birth of Hungarian Merino lambs raised at Ras-El-Hekma Desert Station located in the Egyptian North-Western Coastal Desert. A complete description of the management and breeding practices of the flock was reported by Fahmy *et al.* (1969a).

The least squares method was used to analyze the data. The model adopted to study the environmental effects included year of birth, sex, age of dam and type of birth. Duncan's (1955) multiple range test was used to detect significant ( $P < .05$ ) differences between group means. Data were analyzed in a within-year basis because not all the sires were used in all years. Sex, age of dam and type of birth were included in the model beside sire effect to estimate the error and among-sire components of variance adjusted for these sources of variation. The standard error of the heritability was estimated using the expression reported by Hazel and Terrill (1945).

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### Results and Discussion

All the environmental factors studied had highly significant effects on birth weight of Merino lambs except sex effect which was non-significant (Table 1). These factors were responsible for 36.6% of the total variance. The most important factor was type of birth (25.76%) while each of age of dam and year of birth was of relatively little importance (7.1% and 3.8%, respectively) in relation to total variability. These findings agree with those reported by Vesely and Peters (1964) and Vesely *et al.* (1966). They also agree with findings by Fahmy *et al.* (1969) on data of the same source and including more breeding groups.

Least squares estimates and their standard errors are presented in table 1. lambs born in the first (1961/62) and the last (1965/66) seasons were significantly heavier than those lambs born in the other three seasons.

TABLE 1.—LEAST SQUARES ESTIMATES, STANDARD ERRORS, DIFFERENCES AMONG MEANS, AND THE ANALYSIS OF VARIANCE OF FACTORS AFFECTING BIRTH WEIGHT OF MERINO LAMBS.

Classification	No.	Mean kg.	DF <sup>(1)</sup>	SE	D.F.	M.S.	F.	Variance %
General mean . . . . .	249	3.32	—	.19				
<i>Year effect</i>					4	1.386**	4.5	3.8
1961/62 . . . . .	21	.15	a	.23				
1962/63 . . . . .	64	.01	b	.16				
1963/64 . . . . .	82	-.22	d	.13				
1964/65 . . . . .	36	-.08	c	.20				
1965/66 . . . . .	46	.15	a	.16				
<i>Sex effect</i>					1	0.284	1	0.0
Males . . . . .	124	.03	a	.08				
Females . . . . .	125	-.03	a	.08				
<i>Age of dam effect</i>					3	2.508**	8.2	7.1
2-yr-old . . . . .	24	-.32	d	.26				
3-yr-old . . . . .	17	-.04	c	.30				
4-yr-old . . . . .	5	.09	b	.45				
over 4-yr . . . . .	203	.27	a	.19				
<i>Type of birth</i>					1	10.214**	33.3	25.3
Singles . . . . .	199	.27	a	.09				
Twins . . . . .	50	-.27	b	.09				
Residual . . . . .					234	0.307		63.4

(1) Within the same classification, the presence of the same letter with two constants denotes a non-significant difference (P. 05) between them.

Male lambs were 69 grams heavier than females; such a slight difference was non-significant and agrees with the findings of Sojetado (1952) and Brown and Sabin (1961). Two-year-old ewes bore lighter lambs than older ones. Birth weight of lambs showed a marked increase for each year of increase in age of dam. The differences among the four age groups were significant. Similar findings were reported by many investigators including Vesely and Peters (1964) and Vesely *et al.* (1966). Single lambs were about half a kilogram heavier than twins.

The heritability of birth weight of Hungarian Merino, as estimated from 249 half-sibs belonging to 21 sire-year groups was  $.33 \pm .20$ . Using the half-sib correlation method, Galal (1969) and Fahmy *et al.* (1969b) reported estimates of .16 and .18, and .22, respectively, for the heritability of birth weight in Barki sheep belonging to the same flock as those of the present study. The estimate obtained in this study is also close to those reported by Ragab *et al.* (1956) as .34 in Ossimi sheep, Yao *et al.* (1953) as .35 in Karakul and MacNaughton (1956) as .36 in Canadian Corriedale. All these estimates however, were calculated using the relation between dams and offspring.

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## وزن الميلاد في أغنام المرينو المرباة في الصحراء الشمالية الغربية الساحلية المصرية

### الملخص

درس اثر كل من السنة والجنس وعمر الأم ونوع الولادة على وزن ميلاد ٢٤٥ حمل مرينو من اصل مجرى ومرباة تحت الظروف الصحراوية وقد وجد ان اثر جميع هذه العوامل ما عدا الجنس معنوى كما وجد ان نوع الولادة ( توأم أو فرد ) أكثر هذه العوامل اثرا - وقد قدر المكافء الوراثى لهذه الصفة بمقدار  $٣٣ \pm ٢٠$ .