

## THE EFFECT OF CROSSING EGYPTIAN SHEEP WITH MERINO ON LIVE WEIGHT OF LAMBS

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### SUMMARY

An experiment of crossbreeding of Ossimi and Barky ewes with East German Merino rams "Flesich Schafe" was carried out in Sakha Animal Research Station, Ministry of Agriculture. Five groups of lambs were produced, two crossbred groups, Merino  $\times$  Ossimi and Merino  $\times$  Barky beside the pure Merino, Ossimi and Barky. 325 lambs from birth to one year of age were included in the study.

The purpose of the present investigation was to study the effect of crossing Ossimi and Barky using Merino rams on live weight of the  $F_1$ . The results showed that the male crossbred lambs were intermediate between the two parental breeds from birth to 12 months of age yet the differences were not statistically significant. The growth of crossbred female lambs showed also the same trend.

At two years of age the crossbred sheep were superior to the Ossimi and Barky and the differences in weight were statistically highly significant. The number of animals available was 236 but the number of those included in the two crossbred groups was insufficient to justify the significance.

### INTRODUCTION

In recent years extensive investigations of crossbreeding to improve indigenous breeds of sheep and retain their hardiness and adaptability have been carried out using Merino and its subbreeds in different regions of the world. One of the first examples of the use of Merino in the formation of a new breed was the development of Corriedale in New Zealand.

The present work is a part of a large project aiming to evolve new type of semi-fine fleece that suits the local environmental conditions. Ossimi and Barky were chosen because they are the important white-fleece breeds of the Egyptian sheep. Ossimi is the most popular and widespread of the Egyptian breeds. The body is white with red head. The fleece is a carpet type of medium length. Barky sheep is raised mainly in the western desert. The fleece is white and more improved type of carpet wool compared with the Ossimi. Moreover, it is well known that the Egyptian sheep owe their characteristics mainly

to a long process of selection brought about by nature. They are adapted to the environment and have potential hardiness to suit the local conditions. Therefore, the use of crossing is still essential in evolving a new breed. The East Germany Merino "Fleisch Schafe" was used because it is a mutton Merino type than a wooly one.

The purpose of the present experiment is to study the effect of crossing East Germany Merino with the Ossimi and Barky on the growth of the first crossbred lambs.

#### MATERIALS AND METHODS

This experiment was carried out in Sakha Animal Research Station, Ministry of Agriculture which is located at the north of the Delta. Two flocks of Ossimi and Barky ewes were mated to Merino rams during the mating season, May-August 1960. This was beside maintaining pure flocks of Merino, Ossimi and Barky to produce the purebred lambs.

These flocks were all fed and cared for under nearly similar conditions. Management practices were also kept as uniform as possible. The normal farm practice is to arrange mating season from May to September inclusive so that lambing season starts from October to January (winter season). This because winter in Egypt promotes the growth of lambs owing to the favourable climatic and nutritional conditions.

All lambs were weighed and ear tagged immediately after parturition, then every month till they reached 12 months of age. The weights were recorded to the nearest 0.25 kg. The number of twins was insufficient and only the single male and female lambs were included in the study. At two years of age the available sheep were weighed. Table(1) shows the five groups obtained and the number of lambs available in the present investigation.

TABLE 1.—The five groups obtained and the number in each group

Group	No. Birth 12 months		No. Available at 2 years	
	Male	Female	Male	Female
Merino .. .. .	40	45	30	30
Ossimi .. .. .	40	40	20	40
Barky .. .. .	40	40	20	40
Mer. × Ossimi .. .. .	20	20	2	7
Mer. × Barky .. .. .	20	20	3	19
<b>TOTAL .. .. .</b>	<b>160</b>	<b>165</b>	<b>95</b>	<b>136</b>

## RESULTS AND DISCUSSION

The results obtained in this experiment show that Merino rams had no significant effect on the live weight of their offspring from birth to 12 months of age. Figures 1 and 3 show that the crossbred male lambs of both breeds were intermediate between the two parental breeds.

The differences in weight between the crossbred lambs and local breeds were not statistically significant (Tab. 2,4 & 5). The crossbred female lambs showed the same trend except between the Merino  $\times$  Ossimi and the pure Ossimi where the differences in weight were significant ( $P = <0.05$ ) at birth only. Fig. 2 and 4 show clearly that the growth of crossbred female lambs was more or less the same as the pure Ossimi and Barky. Comparing the two crossbred groups, the differences in weight between the lambs of Merino  $\times$  Ossimi and Merino  $\times$  Barky were not statistically significant (Table 6).

The pure merino is unable to stand the unfavourable nutritional, climatic and management of the local conditions in some regions of the world. Poljaskov (1944), however, described the performance of Württemberg Merino imported to Russia and found that body weight, fertility, wool production fell below the standards. Nichols (1945) reported that there are many successful examples in many countries of producing new breeds of sheep through the introduction of improved breeds. In Russia a number of semifine woolled breeds have been developed as a result of crossing Merino with native breeds (Guseinov 1951 and Rae 1952). The results obtained in this investigation were not in accordance with some of those reported by other investigators. Mallickü (1941) reported that Merino  $\times$  Kozakl fat-rumped was superior by 17.21% in weight. Moreover, Baleveska (1946) has reported results of improvements of a coarse woolled native sheep by crossing with Merino-precocce rams. He found that the birth weight of the  $F_1$  was improved by 33% while adult live weight was increased by nearly the same amount. Sidky (1948) showed that Suffolk  $\times$  Ossimi were 30% and 40% heavier over the Ossimi at birth and at 6 months of age respectively.

However, it seems reasonable to say that, in the wide variety of crosses that have been made, the breeder has worked on the basis that the crossbred will be intermediate between the two parental breeds. An explanation to the results obtained in the present investigation may be due to the fact that the genetic mechanism of heterosis is not yet fully demonstrated (Whaley 1952 and Pontecorvo 1955). Moreover, Mather (1955) has also emphasised that not all crosses display-hybrid vigour. On the other hand it may also

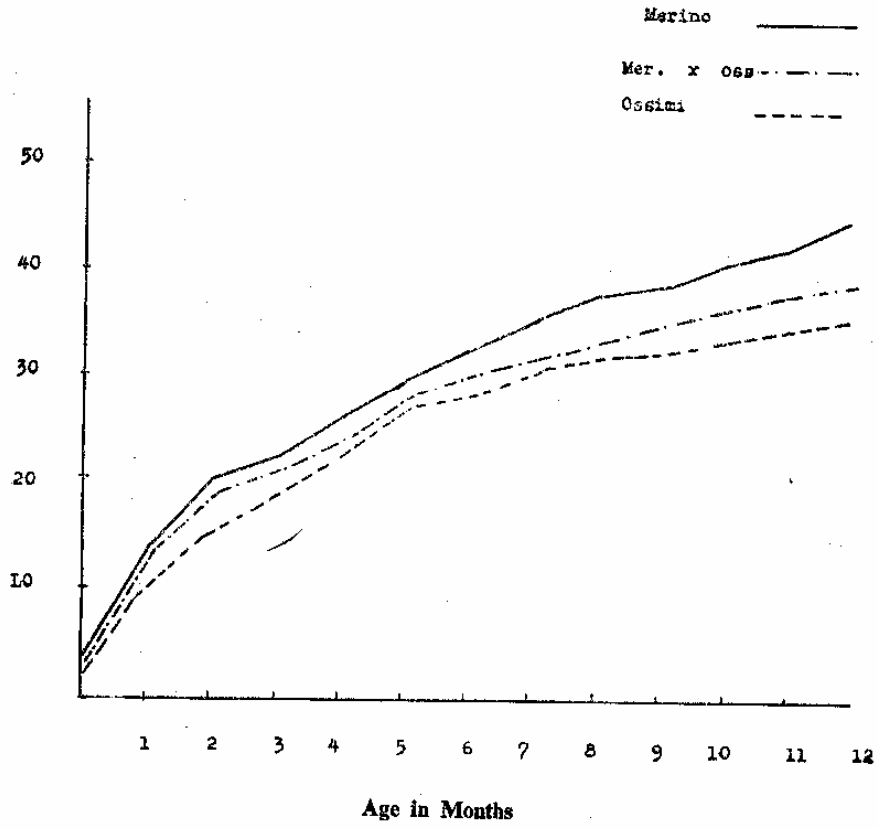


Fig. 1—Growth curves of the Merino, ossimi and the crossbred (Single Males)

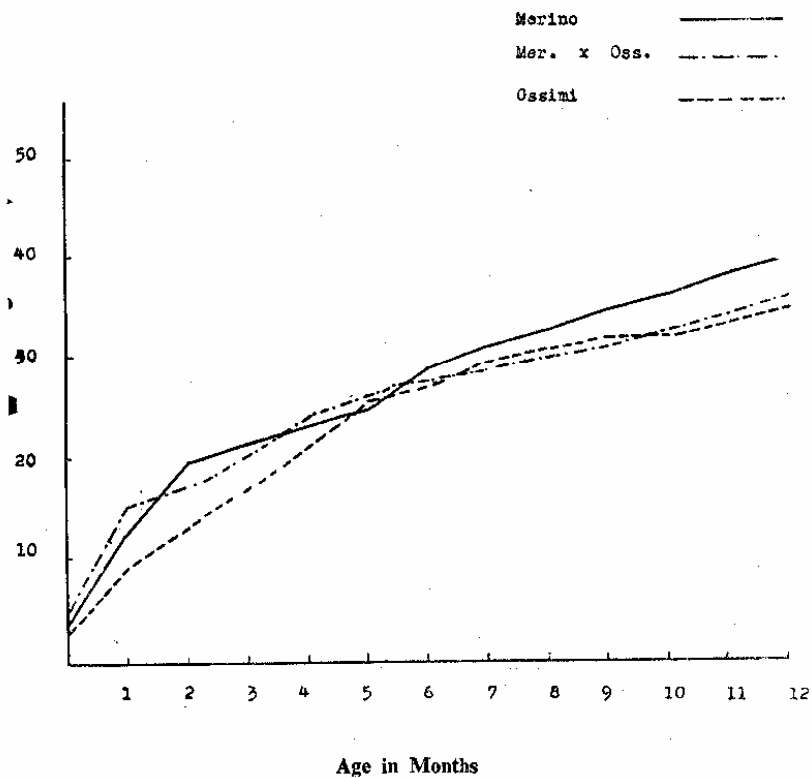


Fig. 2—Growth curves of the Merino, ossimi and the crossbred (Single Females)

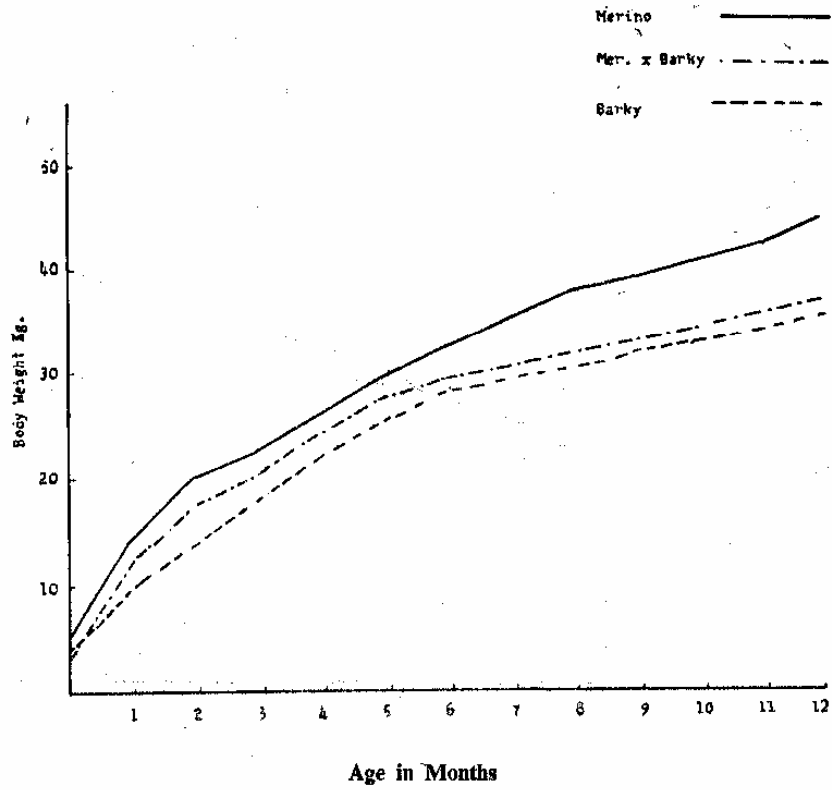


Fig. 3.—Growth curves of the Merino, Barky and the Crossbred (Single Males)

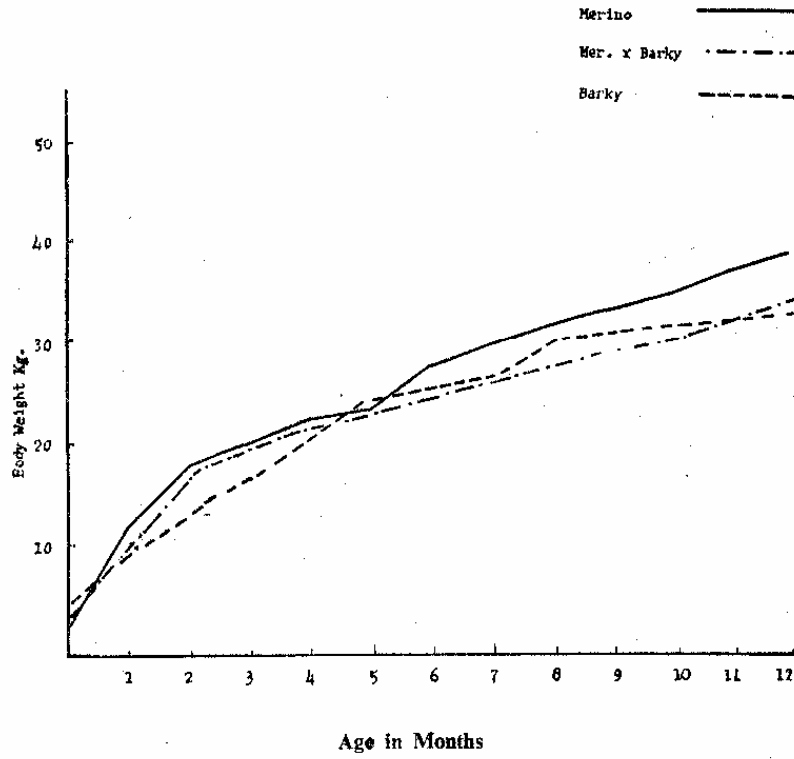


Fig. 4.—Growth curves of the Merino, Barky and the Crossbred (Single Females)

be possible that climatic conditions, standards of management and nutrition were too different or not suitable for the crossbred lambs to show their hybrid vigour from birth up to 12 months of age. However, it may be worth noting that the size of sheep is greatly influenced by environment.

The coefficient of variability was found to be greater at birth, and as lambs advance in age up to 12 months they were more or less equal in weight. This was the general trend between the lambs of the five groups studied except among the crossbred males of Merino  $\times$  Barky where the coefficient of variability was 19.2, 17.3 and 19.8 at birth, 4 months and 12 months respectively, (Table 2).

At 2 years of age the live weight of the crossbred sheep was superior to the Ossimi and Barky. Although the differences in live weight were highly significant yet the number of crossbred sheep was insufficient to justify the significance, (Table 3). However, the crossbred animals were more extreme in weight than their parental parents except between the ewes of Merino  $\times$  Barky. The crossbred Merino  $\times$  Ossimi rams included 2 animals at the age of 2 years. One of these 2 rams weighed 100 kg. and so was superior to the maximum weight found among the individuals of the parental breeds under the same environmental conditions. This may also indicate the great ability of the crossbred for fattening. Bowman (1959), however, studied this special aspect and came to the conclusion that the genetical and physiological basis of heterosis are yet far from being understood.

It is, therefore, essential owing to the results obtained in this investigation and those reported in other regions of the world to tackle this problem comprehensively. It is planned to study the growth of sufficient number of crossbred sheep from birth to 24 months of age and detailed results will be reported in the future.

#### ACKNOWLEDGEMENT

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TABLE 2.— Mean Body weights of lambs of the different breeds and crosses at different ages

Breed	No.	Birth Weight		Weaning age (4 Months)		Yearling	
		Body Weight kg.	C. V.	Body Weight kg.	C. V.	Body Weight kg.	C. V.
Merino Single Male . . . . .	40	4.2 ± 0.215	19.3	26.5 ± 0.751	9.1	45.8 ± 0.687	4.8
Merino Single Female . . . . .	45	3.5 ± 0.214	17.7	23.8 ± 0.843	10.2	40.2 ± 0.843	6.7
Mer. × Oss. Single M. . . . .	20	3.9 ± 0.375	26.4	23.7 ± 0.521	4.8	39.0 ± 1.363	7.9
Mer. × Oss. Single F. . . . .	20	4.0 ± 0.291	2.3	23.6 ± 0.531	7.1	36.1 ± 0.531	5.1
Mer. × Barky Single M. . . . .	20	4.1 ± 0.253	19.2	24.8 ± 1.312	17.3	37.8 ± 0.251	19.8
Mer. × Barky Single F. . . . .	20	3.6 ± 0.275	25.8	23.1 ± 1.125	17.1	35.4 ± 0.593	5.5
Ossimi Single M. . . . .	40	3.6 ± 0.209	20.9	23.2 ± 0.781	12.2	37.9 ± 0.812	6.9
Ossimi Single F. . . . .	40	3.3 ± 0.191	17.5	21.6 ± 0.906	13.9	35.1 ± 1.125	9.9
Barky Single M. . . . .	40	4.5 ± 0.181	17.4	22.9 ± 0.781	11.5	36.3 ± 1.012	8.4
Barky Single F. . . . .	40	4.1 ± 0.275	24.4	21.9 ± 1.062	16.7	33.8 ± 1.251	11.5

TABLE 3.—Mean Body weights of sheep of the different Breeds and crosses at 2 years old

Breed	No.	Body Weight Kg.	C. V.
Merino single Male . . . . .	30	68.2 ± 2.751	12.9
Merino single Female . . . . .	30	45.5 ± 0.937	6.6
Mer. × Oss. Single M. . . . .	2	83.5	—
Mer. × Oss. Single F. . . . .	7	56.1 ± 3.269	15.1
Mer. × Barky Single M. . . . .	3	90.6	—
Mer. × Barky Single F. . . . .	19	43.3 ± 1.562	11.5
Ossimi Single M. . . . .	20	58.1 ± 2.812	15.5
Ossimi Single F. . . . .	40	41.3 ± 1.542	11.4
Barky Single M. . . . .	20	54.7 ± 3.437	20.1
Barky Single F. . . . .	40	34.3 ± 1.031	9.6

TABLE 4.—Mean Body Weights of Merino, Ossimi and the Crossbred at Different Ages

Age & Sex	Merino		Merino × Ossimi		Ossimi		Difference between the Cross-bred & Ossimi		
	No.	Body Wt. Kg.	No.	Body Wt. Kg.	No.	Body Wt. Kg.	Kg.	%	Significance
<i>Single males</i>									
At birth . . . . .	40	4.2	20	3.9	40	3.6	0.3	8.3	Not significant.
4 months . . . . .	40	26.5	20	23.8	40	23.2	0.6	2.5	Not significant.
yearling . . . . .	40	45.8	20	39.0	40	37.9	1.1	2.9	Not significant.
2 years . . . . .	30	68.2	2	83.0	20	58.1	24.9	42.8	No adequate No.
<i>Single Females</i>									
At birth . . . . .	45	3.5	20	4.0	40	3.3	0.7	21.2	p = < 0.05
4 months . . . . .	45	23.8	20	23.7	40	21.6	2.1	9.7	Not significant.
yearling . . . . .	45	40.2	20	36.1	40	35.1	1.0	2.8	Not significant.
2 years . . . . .	30	45.5	7	56.1	40	41.3	14.8	35.8	p = < 0.001

TABLE 5.—Mean Body Weights of Merino, Barky and the Crossbred at Different Ages

Age & Sex	Merino		Merino × Barky		Barky		Difference between the Crossbred & Barky		
	No.	Body Wt. Kg.	No.	Body Wt. Kg.	No.	Body Wt. Kg.	Kg.	%	Significance
<i>Single Males</i>									
At Birth . . . .	40	4.2	20	4.1	20	4.5	0.4	9.7	Not significant
4 months . . . .	40	26.5	20	24.8	20	22.9	1.9	8.2	Not significant
yearling . . . .	40	45.8	20	37.8	20	36.2	1.6	4.4	Not significant
2 years . . . .	30	68.2	3	90.7	20	54.7	36.0	65.8	p = < 0.001
<i>Single Females</i>									
At Birth . . . .	45	3.5	20	3.6	40	4.1	0.5	13.8	Not significant
4 months . . . .	45	23.8	20	23.1	40	21.9	1.1	5.4	Not significant
yearling . . . .	45	40.2	20	35.4	40	33.8	1.6	4.7	Not significant
2 years . . . .	30	45.5	19	43.3	40	34.3	9.0	36.2	p = < 0.001

TABLE 6.—Mean Body Weights of the Two Crossbred at Different Ages

Age & Sex	Merino × Ossimi		Merino × Barky		Difference in Kg.	% of Diff.	Significance
	No.	Body Wt. Kg.	No.	Body Wt. Kg.			
<i>Single Males</i>							
At Birth . . . . .	20	3.9	20	4.1	0.2	5.1	Not significant
4 months . . . . .	20	23.8	20	24.8	1.0	4.2	Not significant
yearling . . . . .	20	39.1	20	37.8	1.2	3.1	Not significant
2 years . . . . .	2	83.0	3	90.7	7.7	8.4	No adequate No.
<i>Single Females</i>							
At Birth . . . . .	20	4.0	20	3.6	0.4	11.1	Not significant
4 months . . . . .	20	23.7	20	23.1	0.6	2.5	Not significant
yearling . . . . .	20	36.1	20	35.4	0.7	1.9	Not significant
2 years . . . . .	7	56.1	19	43.3	12.8	29.5	p = < 0.01

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## أثر خلط الأغنام المرينو بالأغنام المصرية على نمو الحملان

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### الملخص

أجريت بمحطة تربية الحيوان بسخا التابعة لوزارة الزراعة تجربة خلط نعاج الأغنام الأوسيمي والبرقى بكباش نوع المرينو المستورد من المانيا الشرقية . وقد تم الحصول على خمس مجموعات من الحملان ، مجموعتان خليطتان خليط المرينو x أوسيمي ، المرينو x برقى بجانب الحصول على النتائج الأصل لكل من المرينو والأوسيمي والبرقى وقد شملت التجربة دراسة النمو لعدد ٣٢٥ من الحملان من الولادة الى عمر عام .

كان الفرض من التجربة هو دراسة تأثير خلط الكباش المرينو مع نعاج الأوسيمي والبرقى على النمو بين حملان الجيل الأول . وقد تبين من النتائج أن نمو ذكور الحملان الخليطة كان منحصرا بين نمو كل من الأبوين ولكن الفروق في النمو بين الحملان الخليطة وحملان الأوسيمي والبرقى كانت غير معنوية من الناحية الاحصائية من الميلاد الى عمر عام وكان نمو الاناث الخليطة من الميلاد الى عمر عام متشابهة تقريبا مع نمو اناث الأغنام الأوسيمي والبرقى ولم تكن الفروق معنوية .

وفي عمر سنتين فاقت الأغنام الخليطة في كل من خليط المرينو x أوسيمي ، المرينو x برقى الأغنام الأوسيمي والبرقى بدرجة كبيرة وكانت الفروق في الوزن ذات أثر معنوى ولكن اعداد الأغنام في المجاميع الخليطة كانت قليلة وغير كافية من الناحية الاحصائية للحصول على نتيجة حاسمة .