EFFECT OF CROSSING MERINO SHEEP WITH BARKI AND OSSIMI SHEEP ON SOME PRODUCTIVE TRAITS

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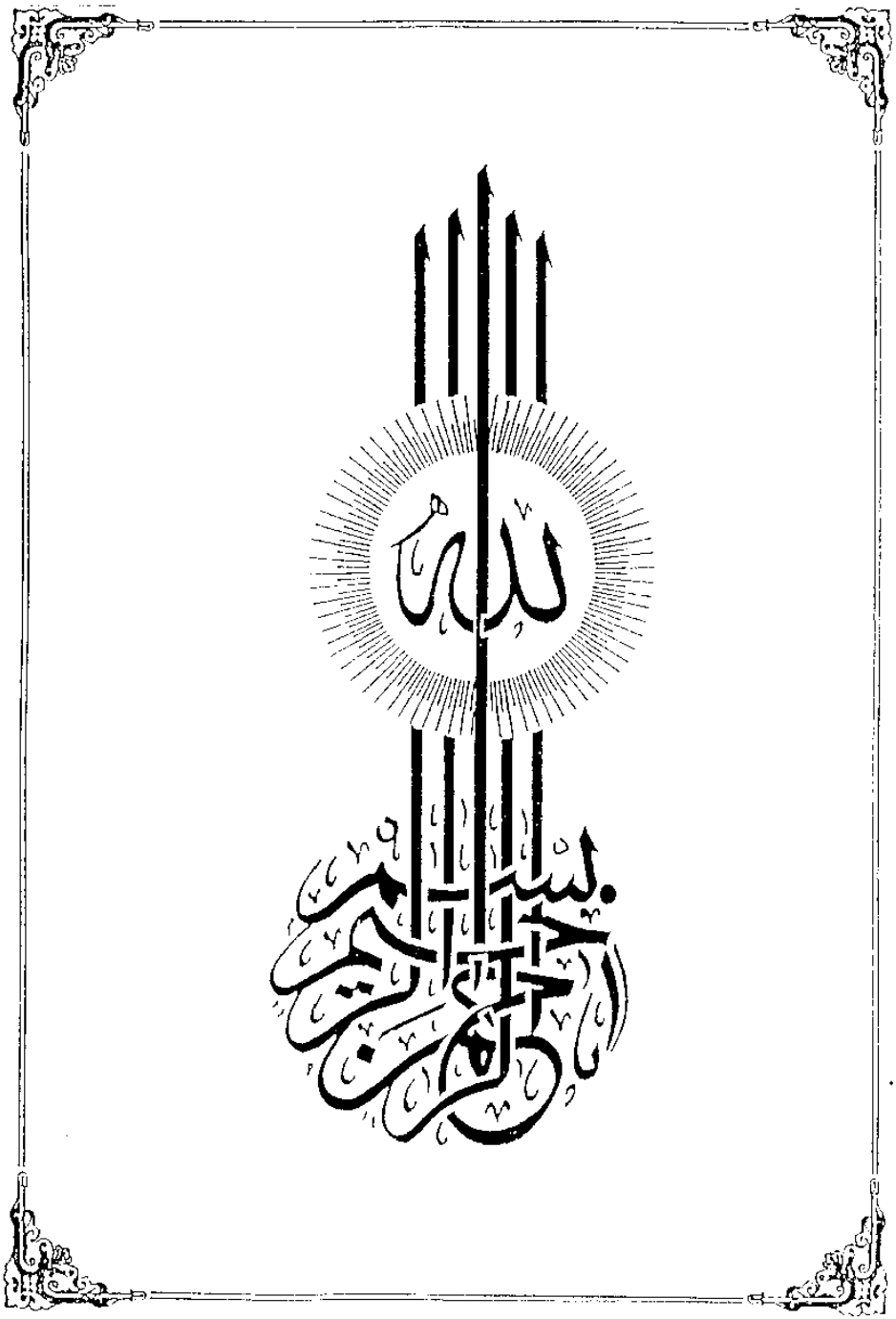

A C K N O W L E D G E M E N T

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C O N T E N T S

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I N T R O D U C T I O N

Local sheep breeds of the U.A.R. are of relatively small size which produce small quantity of coarse wool. The over increasing demand on mutton and wool asks for rapid and efficient plans for the development of these products, good portion of which is now met by inportation.

Two plans for the imporvement of mutton and wool production could be adopted. The first is to import and attempt to acclumatize different improved foriegn breeds of wool and mutton sheep. The other, to up grade the local sheep to these improved breeds. Actually, many breeds have been imported to the UAR by many authorities, i.e. Suffolk, Hamphire, Texel, Leicester and Merino. However, Merino sheep is generally believed to be the most favorable breed under the overall environmental conditions prevailing in the country. The imported Merino was obtained from different sources such as the French Merino Precoce, Hungarian and Caucasian Merino, but in most cases the German Fleisch Merino was the predominant. Fleisch Merino was first imported by the Ministry of Local Administration, Tahreer Province and later by the Meat and Milk Organization which imported about 30,000 heads. Crossbreeding with local breeds was carried out by many experiment stations and University farms. However

the experiments of both the Ministry of Agriculture and the Desert Institute are the largest in this respect.

In the year of 1960, a flock of Fleisch Merino sheep had been imported to Sakha Experiment Station of the Ministry of Agriculture. A plan of grading up of both Ossimi and Barki with Merino was carried out. The present work entails the analysis of the results obtained through this experiment for evaluating different crosses and their economic traits. Furthermore, a planned work had been designed for more genetic studies on these crosses.

REVIEW OF LITERATURE

Birth Weight

In most of the published work on sheep production, birth weight was considered to be one of the most important characters as it affects the survival rate and subsequent weights of lamb

A- Effect of crossbreeding :

Crossbreeding has been widely practiced in sheep, but with different patterns, that can be summarized under three main categories crossbreeding for improving the indigenous sheep, crossbreeding to compare different breeds as parents of crossbred lambs, and crossbreeding for commercial lamb and mutton production.

1- Crossbreeding for improving the indigenous sheep :

This is performed either through up-grading the native stock to the level of performance of the improved breed or through combining the desirable characteristics of both native and superior breeds to produce new crosses. Balevska (1946) crossed Precoce rams with Gorki ewes for 10 years to improve both mutton and wool production , meanwhile keeping the high fertility and ability to with-

stand severe conditions of the native Gorki breed. He reported an increase of 33 percent in birth weight of the F_1 generation over that of the Gorki. Many workers; Guseinov (1951), Zivkovic et al. (1953), Baia et al. (1956), Ivanov (1957), Kovac (1957), Mackenzie(1958), Ahmedov (1961), Palian et al. (1961) and Grehov(1965), studying the performance of crosses of native sheep with superior breeds, reported an increase in birth weight of the crossbred lambs over the indigenous ones.

Cumlivski (1961 and 1962 a) in his study on Shumen and Valachian crosses respectively; Singh and Prasad (1962), and Singh et al. (1962) in their study of Bihar,Bikaneri sheep and their crosses found that crosses exceeded both parents in their birth weight. Similar results indicating the superiority of crossbred lambs at birth than purebreds had been presented by Donald et al (1963), Gjedrem et al. (1966), Gusev (1966) and Skarman (1967) studying the crosses of their local breeds with different mutton and wool breeds.

On the other hand, Stefanescu and Harsian (1955) outlined that the F_1 generation resulting from crossing Prococe rams and Tsigai ewes was not appreciably different from that of Tsigai at birth. Similarly, the F_1 cross-breds of Merino rams on Svæljig ewes had the same birth

weight of Svrljig (Kostic, 1955). Končar et al.(1956) working with Pramenka x Merino crosses; also Kijatkin (1960) studying the crosses of Rambouillet and Lincoln rams with Fat-rumped dams, observed little differences in birth weight between crossbred lambs and their local sheep. Applying continual grading- up, Selepov et al. (1958) found that the backcrosses of F_1 generation to Merino rams raised the lamb's birth weight even more than the 1st generation. Kroiter (1959) obtained similar results with backcross of Precoce x Kazakh Arkhar-Merino to Precoce. However, the birth weight of the F_2 generation of crossing Bikaneres with Bihar local breeds was lower than the F_1 cross (Singh et al., 1962). Aritürk et al. (1963) observed a slight decrease in birth weight of F_1 than F_2 crossbred female lambs of Karayaka x Merino sheep.

There are also examples of using 3-breed-cross, i.e. by using two improved breeds to be brod with indigenous sheep. Skarman (1963) and Shropshire and Leicester breeds on Swedish Landrace, and Zabaliev (1966) comparing the 3-breed crosses of Caucausis with Precoce x coarse wooled sheeps, birth weight was greater for the 3-breed crosses than the 2-breed crosses. Muhamedgaliev et al. (1966) studying the phenomenon of heterosis in crosses between fine-wooled ewes with Lincoln and Romney rams, they exceeded that of Kazakh fine wool by 11.3 percent.

In Egypt Asker, Ragab and Bastawisy (1954) crossed Rahmani with Ossimi local breeds, the results showed that the crossbred lambs were heavier than the two purebreds by 5% at birth. Fahmy (1964); and Fahmy and Galal(1968) studying the crosses of Merino and Barki sheep in the Western desert showed increase in birth weight of crossbred lambs than purebreds. Also, Fahmy, Galal, Ghanem and Khishin (1969) working on the same flock reported a heterosis of 7.3% in the first cross of Merino x Barki This percentage decreased in the different types of crossing in the second generation. In their study with the crosses of Awassi and Barki sheep, they found that the crosses were intermediate between the two parents. Aboul-Naga (1966) showed similar increase in the birth weight of Merino x Ossimi cross over the purebreds. However , the differences were not significant at that age. The backcross to Merino was slightly less than the 1st generation of crosses. Meanwhile Sidky (1948) reported that Suffolk x Ossimi crosses were heavier at birth than the Ossimi breed only. Also, Labban and Radwan (1963) working with Merino, Ossimi, Barki and their first crosses, and Elkouni (1968) studying the crosses of Merino with Barki sheep, pointed out that the crossbred lambs showed intermediate weight at birth between the two purebred parents. Elkouni (1968) showed a negative heterosis of

-5.3% and -1.8% in the first cross and backcross to Merino Ghoith (1969) reported that Merino x Ossimi crosses resembled Ossimi in its birth weight, where it exceeded significantly the Merino lambs.

2- Crossbreeding to compare different breeds as parents of crossbred lambs :

A Comprehensive comparisons between mutton breeds in this respect had been carried out by many investigators. Kincaid (1943) comparing Hampshire and Southdown breeds, found that lambs sired by Hampshire rams averages 1.05 pound heavier at birth than those raised by Southdown. Simmons (1943) using the Hampshire, Shropshire and Southdown Mutton breeds, and Corriedales as a control groups to evaluate the crosses obtained from Karakul x Black-faced Highland, pointed out that the crossbreds resembled the Hampshire more than the other mutton breeds in birth weight. Hamada (1954), Neville et al. (1958), Rempel et al. (1959), Carter et al. (1961), Jamison et al. (1961), Bradford et al. (1963), Sidwell et al. (1964), Singh et al. (1964), Singh et al. (1967), Standy et al. (1968) and Holtman et al. (1969) indicated the significance of sire-breed effect on birth weight, when comparing different crosses of mutton breeds. However, Carter et al.

(1951) reported that the heterosis in crosses of Dorset-horn, Hampshire, Southdown and Merino sheep had little effect on birth weight of lambs. Also Bogart et al.(1957) found no consistent difference in birth weight of lambs sired by Suffolk and other mutton breeds.

Rams of long wool breeds are considered as sires of good mutton lambs. Bogart et al. (1957), demonstrated that lambs sired by Border-Leicester rams excelled the other breeds in birth weight (Hampshire, Cheviot and Suffolk). Also, Anderson (1958) found an outstanding superiority in birth weight of Border-Leicester x Merino than the crosses of Romney or Corriedale with Merino. Where, Terentjev (1963), Razozneav et al. (1964) and Uljjanov (1966) reported a significant difference between Lincoln and Romney crossbreds; Akkizov (1965) found no appreciable differences in birth weight of Romney, Lincoln , Caucases, Tsigai and Liskin sired lambs.

For the fine- and medium-wool breeds; Bell et al. (1950) reported that Columbia sired lambs were consistently heavier at birth than lambs sired by Rambouillet. Scerbanev (1964), found that Precoce single crossbred lambs were heavier at birth than that from Altai or Krasmayarsk finewool, for twins the Altai crossbred was the heaviest. Karmajan et al. (1962), Kroiter et al.

(1966), Bell et al. (1967) and Thrift et al. (1968) reported a significant difference between finewool breeds when used as sires for crossbreds.

Comparing for the dam's breed effect, Hunter(1956) transfered the fertilized egg between ewes of Border Leicester and Welsh Mountain, the birth weight of the crossbred lambs born to Leicester ewes were 1.08 pound greater than those of crossbred lambs from Welsh ewes. Bogart et al. (1957) reported that lambs from Border Leicester-cross-ewes were significantly heavier than those from Cheviot-crossbred ewes, Sidwell et al. (1964) concluded that the 2-breed-cross offspring tend to rank in the same order as the purebred lambs from the dam breed. Within dam's breed it ranked in the order of sires breed. Similarly, Donald et al. (1968) and Holtman et al. (1969) detected a pronounced effect of breed of dam on birth weight of crossbred lambs. However, Matthens et al.(1965) found that the differences in birth weights of lambs from Rambouillet, Columbia and Targhee ewes when mated to Suffolk rams were insignificant Sandikcioglu (1968)reported nonsignificant effect of generation of dam (F_1 or backcross) on birth weight of their lambs.

3- Crossbreeding for commercial lamb and mutton production:

The question of fat-lamb production has been discussed