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## Their First Spring

# Performance of Different Crosses Between Finnsheep And DLS

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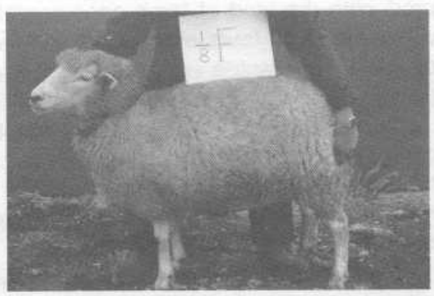
Improving prolificacy in local sheep is frequently the main reason for importing prolific breeds from abroad. That is why USA and Canada imported the Finnsheep in the 1960's and more recently the Romanov and Booroola in the 1980's.

In the mid 1960's Agriculture Canada initiated a project to develop a population of sheep with a long breeding season by combining genes from Australian Dorset, Border Leicester and Suffolk which is presently called DLS. This DLS population was then selected for extended breeding season (*The Shepherd*, August 1990, pages 10-12). The DLS breed lived up to our expectations as far as length of the breeding season is concerned, however, we were not particularly satisfied with the prolificacy of 1.4 lambs born per ewe, we wanted more. It was then, that we thought of borrowing some genes of prolificacy from prolific breeds. Unfortunately, these favorable genes come in a package with many other unwanted genes. Accordingly, one important problem faced us, what proportion of each breed should we put in the cross to produce the ideal animal with the highest return? To answer this question we conducted an intensive study over a period of 10 years using the only prolific breed available to us then, the Finnsheep.

Between 1976 and 1979, we produced the dams and sires of the ewes we intended to test. These included first cross F x DLS, backcrosses ¼ F ¾ DLS and ¾ F ¼ DLS in addition to the pure DLS and Finnsheep. With these genetic groups available we were able to produce many others. From 1979 to 1981, we mated these genetic groups to purebred and crossbred rams in such a way to produce seven combinations ranging between ⅛ F ⅞ DLS (⅛ F) and ⅞ F ⅛ DLS (⅞ F), in addition to the two pure breeds, Finn and DLS. All these ewes, 361 in total, were mated to Suffolk rams to avoid any effect of sire breed. Each ewe was mated in five consecutive years, the first when it was seven to eight months old, and each Fall thereafter. In all, we had over 1300 lambings to evaluate the different groups.

It was important to evaluate not only litter size, but also ovulation rate to determine the full potential of the different genetic groups and also to have an idea about the embryonic loss which occurred before lambing. To do that, ewes in their second, third and fourth lambings were synchronized using vaginal sponges, mated and their ovaries examined by a laparoscope to count the number of ovulations which occurred a few days earlier. Other information collected included conception rate or percentage of ewes diagnosed pregnant to those exposed to rams, prolificacy or number of lambs born and weaned, weight of lambs at birth and weaning. To combine ewe productivity in one measurement, the weight of lambs weaned per ewe exposed was calculat-








## CONCEPTION RATE OF FINNSHEEP, DLS AND CROSSES

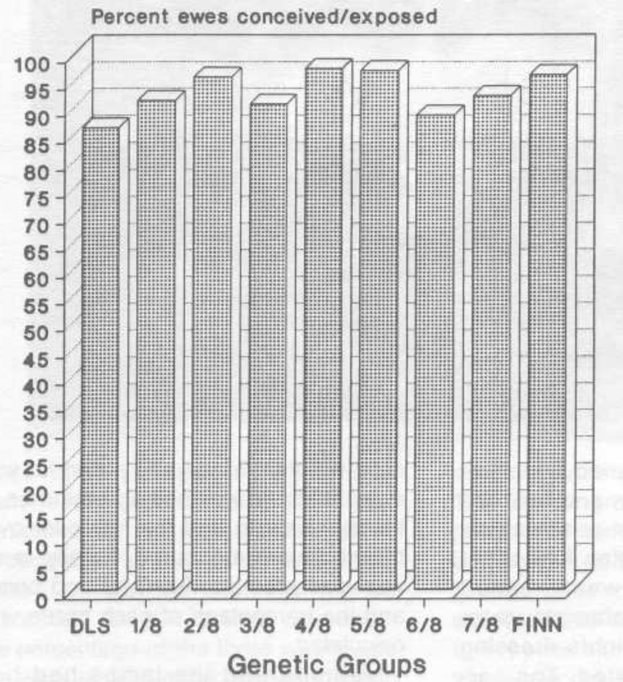



Fig. 1

## OVULATION RATE AND PROLIFICACY OF FINNSHEEP, DLS AND CROSSES

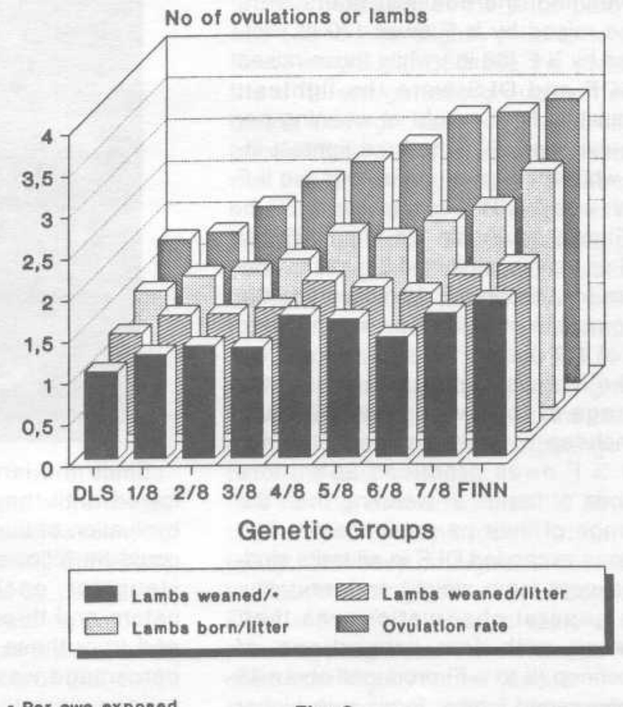



Fig. 2

ed and considered as a representative of overall ewe productivity since it included fertility, prolificacy, lamb survival and mothering ability.

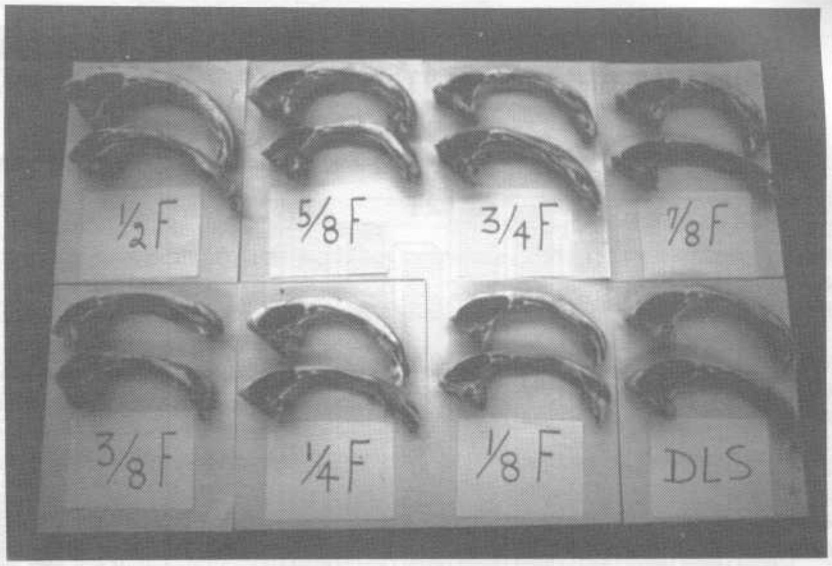
The results of the study are presented in figures 1 to 6. Conception rate over the five lambings was lower in DLS (86.3%) than in the other groups (Fig. 1). This was a result of lower conception rate of DLS yearlings exposed at seven to eight months. It was only 61% compared to 89% for Finnsheep yearlings. The wide difference can be explained by differences in age at puberty, Finnsheep being an early maturing breed. At later parities, conception rate of all genetic groups was similar and high averaging 94%.

As can be noticed from figure 2, ovulation rate and litter size were lowest for DLS ewes and increased progressively with the increase of Finnsheep blood, the relationship was linear, for each increase of ⅛ Finnsheep blood a corresponding increase of 0.24 ovulations can be expected. Number of lambs born in a litter varied between 1.44 for DLS to 2.86 for Finnsheep. The linear relationship which was observed in ovulation rate was also observed for litter size at birth. Each increase of ⅛ Finnsheep blood was responsible for an increase of 0.14 lambs at birth. DLS ewes weaned 1.22 (only 0.7 lambs as yearlings) and Finnsheep 2.03 lambs (1.7 as yearlings). The crosses were intermediate with the performance of the ⅜, ⅝ and ⅞ F close to that of the pure Finnsheep. Figure 2 also presents the fecundity of the different genetic groups, i.e., number of lambs weaned per ewe exposed to rams. This trait takes into account the fertility of the ewes and their prolificacy. Finnsheep ranked first with 1.9 lambs followed by ⅞ and ⅝ F with 1.7 lambs. On the other hand DLS ewes averaged 1.1 lambs.

Embryonic mortality (ovulations not resulting in lambs at birth and results from failure at fertilization time and/or death and reabsorption of foetuses at different stages of pregnancy) ranged from 12.4% for ⅛ F to 42.5% for ⅝ F (Fig. 3). Finnsheep ewes had the second lowest loss (19.6%). When expressing embryonic mortality in terms of total number of ovulations, Finnsheep ewes proved to be the most efficient followed by ⅛ and ⅝ F. However, many Finnsheep lambs died at birth (7.1%) and before weaning (22.9%). Total loss (ovulations and lambs) was about 50% in Finnsheep compared to 39% for DLS.

Finnsheep ewes had the heaviest litters at birth (15.6 lb.) but the average weight of individual lambs was lighter (5.47 lb.) than in other groups (Fig. 4). At weaning, the heaviest litters were those raised by 4/8 F ewes (70 lb.) followed by 7/8 F (68 lb.) while those raised by 2/8 F and DLS were the lightest. Calculating litter weight at weaning per ewe exposed, DLS had the lightest litters while the highest group was the 4/8 F which weaned 61 lb. compared to 57 lb. for Finnsheep. Again the low fertility of DLS as yearlings caused the low overall return for this breed. At older ages the performance of DLS ewes was close to that of 1/8, 2/8 and 3/8 F ewes.

The crosses were compared with the average of the two breeds DLS and Finnsheep to estimate the heterosis. The 4/8 F ewes produced 25% more pounds of lambs at weaning than the average of their parental breeds. The crosses exceeded DLS in all traits studied except lamb weight and mortality. The general observation was that, crosses with low proportions of Finnsheep (1/8 to 3/8 F) produced about 48 lb. of weaned lambs, those with higher proportions (5/8 to 7/8 F) produced about 54 lb. whereas the 4/8 F cross gave the highest performance of 61 lb.




Since the lambs weaned were followed until they were marketed, the evaluation of the different combinations could be followed one step further. At slaughter, each lamb was weighed before and three days after slaughter and from these two weights dressing percentage was calculated. The carcasses were then divided into three commercial cuts shoulders, loin-racks and legs, the proportions of each was calculated by dividing its weight by carcass weight. Kidney and pelvic fat was separated and weighed and the area of the eye muscle and the fat cover over the ribs were measured. Finally, a rib was dissected into lean, fat and bones and the percentage of each tissue was calculated.

Although all the lambs had half Suffolk blood in them, the other half coming from the different combinations, resulted in some interesting differences among the market lambs. For example,

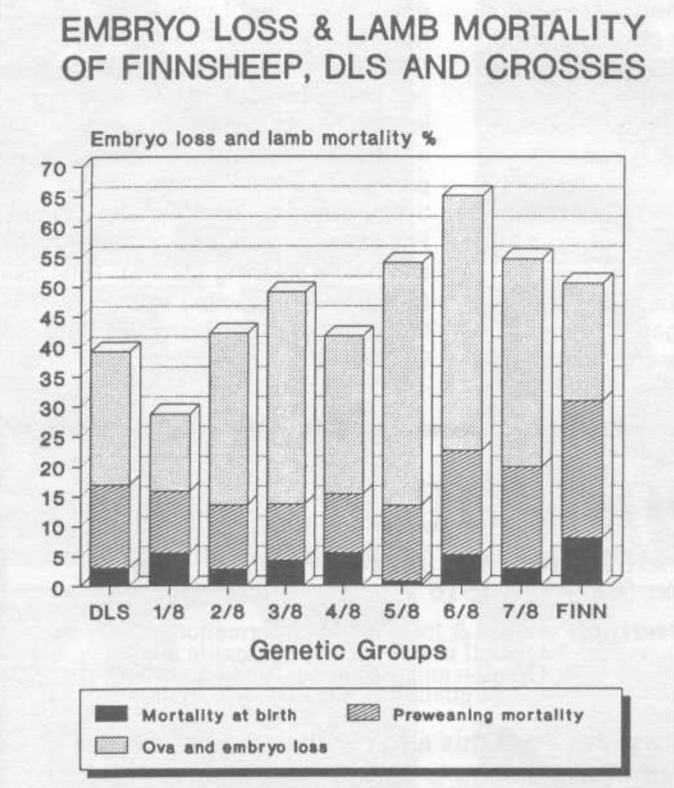



Fig. 3

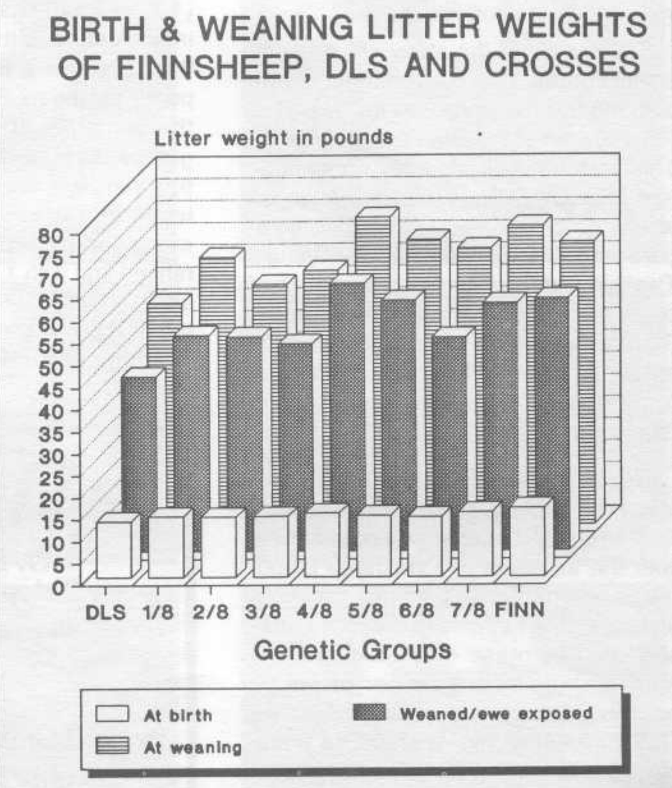
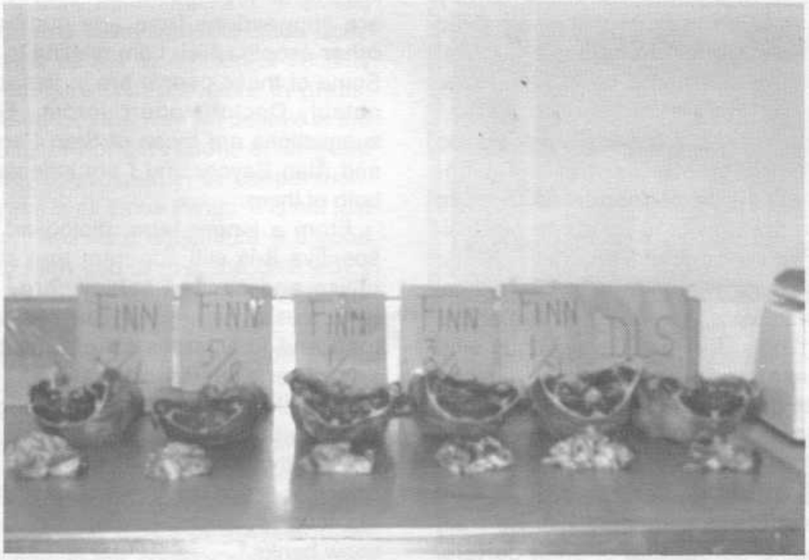



Fig. 4



dressing percentage of lambs with Finnsheep mothers was 2.6% higher than those with ⅜ F mothers. The higher fat deposition in the kidney and pelvic areas from the Finn mothers may be responsible for part of such difference. The percentage of the three whole-sale cuts were similar in the different genetic groups varying within two percentage points.

The final evaluation of this study was done by calculating the monetary revenue from selling the market lambs. The following calculations were made, number of lambs weaned (assuming that none died from weaning to market) X lamb value (calculated by multiplying weight at 200 days X dressing percentage X price of the carcass (sum of each wholesale cut X the price of that cut)). At the time of that evaluation, the pound of leg, loin and shoulder was sold for 4.5, 6.0 and 2.2 Canadian dollars, respectively. The monetary revenue by ewe in the different groups is presented in figure 5, and shows that Finnsheep ewes gave back 320 dollars in lamb sales, higher than all the other genetic groups despite that the price paid for each lamb was slightly inferior to that for other groups. Because the ewes of the different genetic groups differed greatly in weight, and this implies difference in feed and management costs, it was thought proper to calculate the revenue per pounds of live weight to correct for that factor. The results are presented in figure 5. These calculations do not account for revenue from selling the wool, however, since wool production and wool quality was similar in the different groups, (Fig. 6) adding revenue from selling the wool to the calculations is not expected to change by much the final findings.

It can be concluded that the advantage in prolificacy brought about by using Finnsheep at higher proportions in crossbreeding schemes, offsets the slight reduction in carcass value of the resulting progeny and the reduced revenue from slightly lighter fleeces.

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*In Israel, farmers report that spreading lion droppings in a field will keep the wild gazelles out.*

## REVENUES FROM SELLING LAMBS OF FINNSHEEP, DLS AND CROSSES

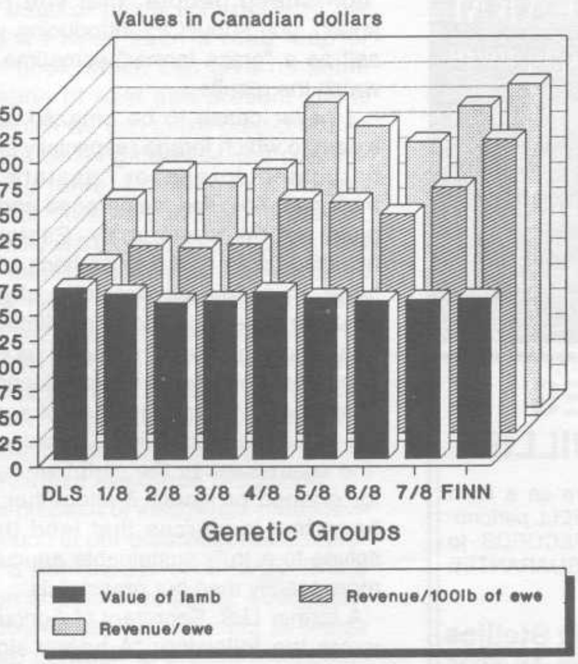
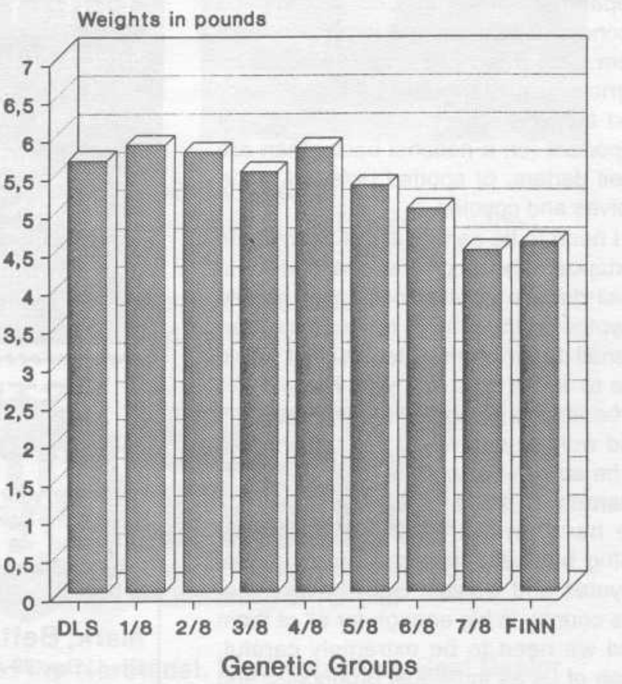



Fig. 5

## GREASE FLEECE WEIGHT* OF FINNSHEEP, DLS AND CROSSES




* Avg. of first four shearings

Fig. 6