Growth rates, wool production and health of Awassi and Texel crossbred ram lambs

T.W. KNIGHT, N.A. THOMSON[1], M.J. POWER AND J. GALLEN

AgResearch Flock House Agricultural Centre, Private Bag, Bulls, New Zealand.

ABSTRACT

Birth and weaning weights, liveweight gain, wool weights and characteristics, and animal health were recorded on 214 ram lambs consisting of about equal numbers of Awassi and Texel cross Romney, Coopworth and Dorset ram lambs. Changes in blood GGT concentrations were also measured in Awassi x Coopworth and Romney ram lambs following dosing with sporidesmin.

Pre- and post-weaning growth rates of Awassi crossbreds were lower ($P<0.001$) than Texel crossbreds. Awassi crossbreds had a higher incidence of footscald and higher ($P<0.05$) strongyloid egg counts in their faeces in May. After dosing with sporidesmin blood GGT concentrations were higher ($P<0.001$) in Awassi x Coopworth than Romney ram lambs. Awassi crossbreds had lower ($P<0.001$) fleece weights and wool quality than Texel crossbreds.

Keywords: Awassi; Texel; crossbred; wool; growth.

INTRODUCTION

Awassi sheep were introduced from Israel to New Zealand as embryos in May 1991 and will be released from quarantine in 1994. They were imported to improve the milk yields of milking sheep and to provide a terminal sire for live sheep exported to the Middle East, where fat-tailed sheep can command a premium in prices over thin-tailed sheep. The breed was developed in semi- arid climates (Epstein 1985) and the strain imported into New Zealand was selected for milk production under zero grazing conditions. There is only limited data on its performance in a temperate environment (Epstein 1985). The potential for the Awassi as a terminal sire to produce lambs for live sheep export depends on the ability of the crossbred lambs to grow and produce good quality wool in the New Zealand environment.

The aim was to compare the animal health, wool characteristics, and growth rate of Awassi and Texel crossbred ram lambs.

MATERIALS AND METHODS

A flock of 700 mature ewes with about equal proportions of Romney, Coopworth and Dorsets were randomly allocated within breed to two groups on 5 May 1992. One group of 400 ewes entered the Flock House Awassi Sheep Quarantine Unit and the ewes were artificially inseminated with semen from one of 7 Awassi ram hoggets. The other 300 ewes remained outside of quarantine and the ewes were single-sire-mated to one of 9 Texel rams for 21 days. Twenty pregnant ewes from each breed were moved into quarantine 6 weeks before their expected start of lambing on 1 October. This was to allow for location effects on lamb birth weights and growth rates to weaning to be corrected for in the statistical analysis. Lambs were weaned on 22 December and on 7 January 1993 the remaining Texel crossbred ram lambs (Texel crossbreds) were brought into quarantine and rotationally grazed with the Awassi crossbred ram lambs (Awassi crossbreds) until 6 August 1993 (ie. about 10 months of age). Pasture on the unit was poor, predominately Browntop (*Agrostis capillaris*), Yorkshire fog (*Holcus lanatus*) and creeping bend (*Agrostis stolonifera*), and was similar to adjacent pasture described by Thomson and Power (1991).

Tails were left on the lambs and they were not castrated. They were weighed at birth, weaning, and thereafter every month. The lambs were shorn on 16 February and individual fleeces weighed. A wool sample was collected from the mid-side of each lamb and bulked for each breed for analysis by the New Zealand Wool Testing Authority. On 17 and 30 November the lambs in quarantine were assessed for interdigital dermatitis (footscald). At monthly intervals from 11 January to 4 August, 10 lambs from each crossbred group were faecal sampled and the number of strongyloid and nematodirus eggs were counted. The lambs were sampled 8-26 days after drenching except in April and May when the interval was 36-38 days, and in August when the last drench was 55 days before faecal sampling.

On 31 March 1993, 30 Romney ram lambs were brought into quarantine and grazed with 30 Awassi x Coopworth ram lambs. On 15 April the 60 lambs were dosed with sporidesmin at a rate of 0.12mg/kg liveweight and blood samples were collected before, and 11, 19 and 27 days after dosing. The blood samples were sent to Ramguard - Facial Eczema Tolerance Testing Service in Hamilton for analysis of gamma-glutamyl-transferase (GGT) levels. Liver damage was assessed as severe for GGT >500IU/l; moderate for GGT of 200-499 IU/l, slight for GGT of 50-199IU/l, and nil for GGT <50IU/l.

Statistical Analysis

Repeated measures analysis (SAS 1987) was used for comparison of liveweights, and analyses of variance was used for birth, weaning and 10 month weights, growth rate and fleece weight. GGT concentrations were compared by using

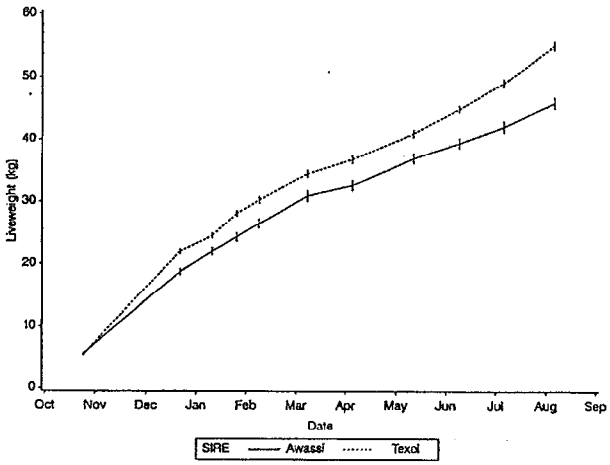
[1]Dairying Research Corporation, Private Bag, Hamilton, New Zealand.

repeated measures analysis after negative inverse transformation of the data. Numbers of strongyloids eggs per g of fresh faeces (epg) in April and May were compared by using analysis of variance after log transformation of the data. The data for the other 6 months were pooled and the proportions of lambs with a strongyloid egg count of zero were compared using Chi Square.

Results

Whereas there were no effects of sire breed on birth weights, Awassi crossbreds were lighter (P<0.001) at weaning than Texel crossbreds. This difference in liveweight increased with time (P<0.001) and at 10 months of age they were 9kg lighter than Texel crossbreds (Figure 1). Growth rates from birth to weaning and from weaning to 10 months of age were lower (P<0.001) for Awassi than Texel crossbreds.

FIGURE 1: Mean (± SEM) liveweight of Awassi and Texel crossbreds from birth to 10 months of age.



Numbers of nematodirus epg were below 100 at all times. In April and May, when the interval from last drench to sampling was 36-38 days, all lambs sampled had some strongyloid epg eggs. While there were no significant differences in the mean numbers of strongyloid epg in April, the Awassi crossbreds had more strongyloid epg (P<0.05) than Texel crossbreds in May (Table 1). When the interval from drenching to faecal sampling was 26 days or less, and in August, few (2-5%) lambs had strongyloid epg greater than 500. After pooling the data over these months, a lower (P<0.001) percentage of Awassi (55.5%) had zero strongyloid epg than Texel crossbreds (76.9%).

TABLE 1: Mean (± SEM) for the $\log_{10}$ transformed strongyloid faecal egg counts per g fresh faeces for Awassi and Texel crossbred ram lambs in April and May. The back transformed means are presented in parenthesis.

Month of Sampling	Awassi	Texel
April	3.294 ± 0.057 (1970)	3.226 ± 0.055 (1683)
May	3.056 ± 0.063 (1138)	2.872 ± 0.060 (745)

None of the Texel crossbreds had footscald on 17 or 30 November. For Awassi crossbreds the percentage of lambs with moderate to severe footscald on at least 1, 2, 3 or 4 feet was 15%, 8%, 3% and 1% respectively on 17 November. After the lambs were put through a zinc sulphate footbath on 18 November, some Awassi crossbreds still had moderate to severe footscald 12 days later, with the percentage of lambs with at least 1, 2 or 3 feet affected being 6%, 2% and 1% respectively.

On the day the lambs were dosed with sporidesmin there was no difference in GGT concentrations between Awassi x Coopworth and Romney ram lambs, but 11, 19 and 27 days after dosing, GGT concentrations were higher (P<0.01) in Awassi x Coopworth than in Romney ram lambs. Based on the GGT concentrations it was estimated that 47% of the Awassi x Coopworth and none of the Romney ram lambs had moderate to severe liver damage. There were however 6 Awassi x Coopworth ram lambs with no apparent liver damage.

Fleece weights of Awassi crossbreds (0.72 ± 0.02kg) were lower (P<0.001) than Texel crossbreds (0.80 ± 0.02kg). Mean wool characteristics for each crossbred pooled over the three dam breeds are presented in Table 2. Awassi crossbreds fleeces had higher yields and staple length but lower staple strength. The fibre diameters of wool from Awassi and Texel crossbreds were similar.

TABLE 2: Wool characteristics of Awassi and Texel crossbred ram lambs. Each figure is the mean for the bulk samples from each of the three dam breeds.

	Awassi	Texel
Yield	81.0	75.0
Bulk (cm^3/gm)	22.0	25.0
Fibre diameter (microns)	27.7	27.0
Vegetable matter (%)	0.2	0.2
Colour		
X	49.0	64.0
Y	49.0	66.0
Z	47.0	65.0
Y-Z	2.1	1.5
Staple length (mm)	85.0	54.0
C.V. staple length (%)	20.0	22.0
Staple strength (Nt/Ktex)	45.0	67.0

DISCUSSION

The lower weaning weight, and pre- and post-weaning growth rates of Awassi compared with Texel crossbreds contrasts with the results of Hill *et al.*, (1993) where there were no differences in the weaning weight or pre- and post-weaning growth rates between purebred Awassi and Coopworth ram lambs. While the birth weights of their Awassi and Coopworth lambs were lower than in the present experiment, the pre- and post-weaning growth rates, weaning weights and 6 month weights were higher. This possibly reflected the 400-600g/day/head of concentrates Hill *et al.*, (1993) fed their lambs.

The lower liveweight gains recorded in the Awassi crossbreds may have been a reflection of the poor adaptation of the breed to the NZ environment as indicated by the higher suscep-

tibility to footscald, facial eczema and internal parasites. The high incidence of footscald in Awassi crossbreds agrees with observations with purebred Awassi lambs (Hill *et al.*, 1993).

Indications of higher susceptibility of the Awassi crossbreds to internal parasite as suggested by the data from this experiment contrasts with the results of Hill *et al.*, (1993) where epg was lower in purebred Awassi than Coopworths. In their experiment however faecal egg count did not increase above 150, whereas high faecal egg counts (1138-1970 epg) were obtained on at least 2 occasions in this experiment. Neither experiment directly tested the susceptibility of Awassi or Awassi crossbreds to internal parasites and this should be undertaken in future research.

The higher incidence of animal health problems compared to New Zealand bred sheep is not unexpected given that the Awassi was bred in semi-arid conditions (Epstein 1985). The fact that some Awassi crossbreds had no response to the dosing with sporidesmin and/or no signs of footscald, suggest a breeding programme could develop a strain adapted to the New Zealand environment.

The poor quality of the Awassi crossbreds fleece reflects a similar poor quality of fleeces from purebred Awassi (Hill *et al.*, 1993). The yield was higher, staple length longer and the staple strength was lower for Awassi compared with Texel crossbreds. Whereas the pure bred Awassi had a white fleece with patches of colour, in the crossbred the colour was all through the fleece. The small differences in fibre diameter between Awassi and Texel crossbreds contrasts with the 4.2u greater fibre diameter of purebred Awassi compared with Coopworth lambs (Hill *et al.*, 1993).

In conclusion, a premium for producing Awassi crossbred lambs would be essential to compensate for the lower growth rates, greater animal health problems and poor wool quality. A breeding programme for improving the adaptation of Awassi to the New Zealand environment is required if they are to be used as a terminal sires for lamb production.

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