

STUDIES ON THE PERFORMANCE OF AWASSI SHEEP IN PAKISTAN

Part I. Some Productive Traits

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(Received January 1, 1990; revised July 28, 1990)

Data on 1011 lambs of Awassi sheep reared at the Livestock Production Research Institute, Bahadurnagar (Okara) during 1965-1984 were analysed to study the influence of some biological factors on productive traits.

The overall mean birth weight was $4.08 + 0.02$ kg. The single born lambs were heavier than the twin born lambs. The male lambs were also heavier than the female lambs.

The average weaning weight and age were $27.94 + 0.22$ kg and $118.36 + 0.062$ days, respectively. The correction factors based on the prediction equation were developed for each birth type and sex separately. The factors were used to bring all the records of weaning weight to 120 days comparable basis. These adjusted weaning weights also differed significantly due to sex, birth type and year of lambing.

The daily growth rate also varied significantly in the two birth types, sexes and year of lambing. The average daily growth rate upto weaning was $0.204 + 0.002$ kg/day. The overall average wool yield was $3.02 + 0.04$ kg and was higher amongst single born ewes ($3.04 + 0.03$ kg) than twin born ewes ($2.94 + 0.06$ kg).

Key words: Productive traits, Awassi sheep, Birth weight.

Introduction

The Awassi sheep is a native of the Middle-East and famous for higher mutton, wool and milk yield. The ewes have been reported to produce 277 kg milk in a single lactation and fleece weight of 4.2 kg annually. The adult body weight was reported to be 81.5 kg in male lambs (Tafta, *et. al.* [1]). This breed was introduced in Pakistan from Lebanon during 1965 and was kept at the Government Livestock Farms, Punjab. The imported flock consisted of 50 ewes and 10 rams. Data on various productive traits of the imported flock and their progeny have accumulated during the last 20 years. Analysis of this data could provide information about lambs survival in relation to the existing environment. It was planned to investigate various aspects of production and adaptability of this breed under Pakistani environments in respect of growth characteristics and wool production. Attempts were made to study the influence of year, birth type and sex on birth weight, weaning weight and age at weaning, preweaning daily growth rate, survival rate and wool yield in this breed. This study will help to ascertain the suitability of Awassi breed for widespread propagation in the irrigated plains of the country.

Materials and Methods

(a) *Source of data.* Breeding and performance records on Awassi sheep kept at Livestock production Research Institute, Bahadurnagar, Okara during 1965-84 were used for the investigation. The feeding and managemental practices in the period remained the same. The feeding depended on grazing good quality forage which was supplemented with

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concentrate in barn during the lean periods. Flushing of breeding ewes was also practiced during the breeding season. Breeding of ewes was mostly in the autumn and lambs were received during the spring. The lambs were weighed at birth and allowed to suckle their dams. The weaning age varied from 46 to 155 days. All prophylactic measures against contagious, endo-and-ecto parasitic diseases were undertaken. The shearing was done once a year during 1965-73, whereafter, it was repeated twice a year. Data on the following production traits was collected:

- (i) Birth weight and type.
- (ii) Weaning weight and age.
- (iii) Adult weight.
- (iv) Greasy fleece yield.

Data from the above mentioned parameters were used to calculate preweaning daily weight gains.

(b) *Statistical analysis.* The birth weight records were grouped according to birth type and sex of lambs. Means and standard errors for birth weight in each class were calculated. The weaning age showed wide variation from 46 to 155 days and found significantly different ($P < 0.01$). Since there were high positive correlations between weaning age and weight in various groups, it was considered appropriate to adjust weaning weights to a 120 days comparable basis. Correction factors were developed using prediction equations for the two sexes and birth types separately. The following model was used for the prediction equation.

$$Y = \alpha + B X$$

where Y = is the estimated weaning weight in kg;

α = is the constant value;

B = is the regression of weaning weight on weaning age;

X = is the weaning age in days.

The prediction equations for estimating weaning weight from weaning age are:

REGRESSION EQUATIONS FOR PREDICTING WEANING WEIGHT (Y) FROM WEANING AGE (X).

Birth type	Sex	Regression equation		
Single	Male	Y = 10.774	+	0.1709 X
	Female	Y = 13.366	+	0.1211 X
Twin	Male	Y = 4.997	+	0.1757 X
	Female	Y = 5.367	+	0.1532 X

The adjusted weaning weights were used for further analysis. The daily weight gains were calculated by using the actual weaning weights in the two birth types for male and female lambs separately. The correlation coefficients between birth weight and weaning weight was also calculated.

Data on birth weight, weaning weight and rate of gain were analysed to examine the effect of year of lambing, birth type and sex. The number of observations for the years 1965, 1977, 1978 and 1980 were not sufficient, hence, these years were excluded in the analysis of variance. Since there were unequal disproportionate sub-class number, the data could be analysed by

- (1) Method of unweighted mean
- (2) Method of expected subclass number

In the study, data were analysed using method of unweighted means (Bancroft, [2]).

Results and Discussion

(i) *Birth weight.* Single born lambs were heavier at birth than twin born lambs and male lambs were heavier than female lambs in both the birth types (Table 1).

The analysis of variance of birth weight revealed that differences between birth type, sex and year of lambing

were significant. All possible interactions were significant. The yearly differences for this trait reflected variation in feeding and managemental practices.

Similar data on birth weight (4.2 kg) in Awassi sheep were reported by Vanli, *et al.* [3]. Ghoneim, *et al.* [4] reported that birth weight in Awassi lambs was affected by sex and birth type only while the effect of year was non-significant.

The results of the present investigation about the mean birth weight in Awassi lambs differed to that of (Kassab [5], Tafta, *et al.* [1] and Roda, *et al.* [6]), who reported higher and lower birth weights in the lambs of Awassi sheep.

(ii) *Weaning age.* Data on the weaning age among male and female lambs of two birth types is given in Table 1. Analysis of variance revealed significant differences of year and birth type, but non-significant difference for male and female lambs.

The results of the present study of the weaning age agree with Nawaz [7], who reported that the overall weaning age in Awassi sheep as 117.92 days. However, the overall weaning age in Kachhi lambs kept with the flock under study was reported to be 130.760 days, which was more than the average weaning age in the present study.

A number of other workers reported that weaning weight differed significantly due to year, sex and birth type (Labban, *et al.* [8] Cambellas, *et al.* [9] and Roda, *et al.* [6]).

(iii) *Weaning weight.* Male lambs were heavier at weaning than the female lambs and single born lambs were heavier than twin born lambs (Table 1). The weaning weight differed significantly due to sex, birth type and year of lambing. All the interactions were also significant.

The results of the present investigation regarding the mean weaning weight are in agreement with the finding of (Tafta, *et al.* [9], who reported that weaning weight ranged from 26.0 to 30.0 kg in Awassi lambs. A number of workers reported that weaning weight differed significantly due to year and sex (Labban, *et al.* [8] Roda, *et al.* [6]. Vanli, *et al.*

TABLE 1. MEANS AND STANDARD ERRORS FOR VARIOUS PRODUCTIVE TRAITS IN AWASSI SHEEP.

Traits	Single		Twin		Overall
	Male	Female	Male	Female	
Birth weight (kg)	4.36 + 0.04 (350)	4.16 + 0.03 (395)	3.67 + 0.05 (134)	3.54 + 0.05 (132)	4.08 + 0.02 (1011)
Weaning age (days)	117.18 + 1.06 (302)	117.33 + 1.03 (344)	122.53 + 1.43 (117)	120.25 + 1.62 (121)	118.36 + 0.62 (884)
Weaning weight (days)	31.20 + 0.32 (302)	27.20 + 0.41 (344)	26.07 + 0.39 (117)	23.74 + 0.32 (121)	27.94 + 0.22 (884)
Prewaning weight gain (kg)	0.227 + 0.003 (302)	0.202 + 0.002 (344)	0.187 + 0.003 (117)	0.170 + 0.003 (121)	0.204 + 0.002 (884)
Survival rate upto weaning (%)	86.29	87.09	87.31	91.67	87.44
Wool yield (kg)	—	3.04 + 0.03 (722)	—	2.94 + 0.06 (260)	3.02 + 0.04 (982)

Figures in the parenthesis indicate number of records.

[3] reported that weaning weight in Awassi lambs was 18.1 kg which is quite lower as compared to the weaning weight in the present study.

(iii) *Correlation coefficient between birth weight and weaning weight.* Birth weight was positively correlated with adjusted 120 days weaning weight and the correlation coefficient was 0.405 ($P < 0.01$) and $r = 16.4\%$. Regression coefficient of weaning weight and birth weight was 3.0 kg. The variation in weaning weight due to birth weight was 16.4%. The weaning weight increased by 3.001 kg for each 1 kg increase in birth weight. The highly significant positive correlation between birth weight and weaning weight suggests that an early selection based on birth weight would be helpful for higher body weight at weaning but it may cause lambing difficulty. Nawaz [7], however, reported significant correlation between the two traits as 0.29 and 0.18 in single and twin Awassi lambs, respectively; these correlations were also significant.

(iv) *Daily weight gain.* Male lambs grew faster than female lambs in each class (Table 1). The analysis of variance of daily weight gain showed significant difference between years, sexes and birth type. All possible interactions were also found to be significant.

The results of preweaning weight gain obtained in the present study agree with Nawaz, *et al.* [10], who reported that the preweaning daily weight gain was $204 + 4.00$ g in Awassi sheep. However, the daily weight gain in Kachhi lambs kept under the same environmental conditions was reported to be $137 + 3.0$ g, which was lower than the daily weight gain as obtained in the present investigation.

(v) *Survival rate.* The information on survival rate upto weaning in single and twin born lambs is given in Table 1. The survival rate varies between 86.29 to 91.67% in both sexes and birth types. The survival rate was higher among the twin born lambs compared to the single born lambs. The survival rate in the female lambs was better than the males in both the birth types in the present study.

The results about the survival rate as obtained in the present investigation are in agreement with the findings of Labban, *et al.* [8]. Similarly, Ghoneim, *et al.* [11] found mortality in Awassi lambs as 16%. However, the survival rate reported by Yalcin and Aktas [1969] were 96% in Awassi lambs, which was higher than the present study.

(vi) *Wool yield.* The overall average annual wool yield was $3.02 + 0.04$ kg in Awassi ewes (Table 1). The wool yield was higher amongst the single born than the twin born ewes.

The analysis of variance of the first shearing wool yield revealed that ewes born as single or twins significantly differed in this trait.

The wool yield also varied significantly in different

years. The interaction between year and birth type was also significant.

The estimates of wool yield in Awassi sheep were reported to range from 2.81 to 2.92 kg (Vanli, *et al.* [3] and Nawaz, *et al.* [10]). The present results were lower than Tafta, *et al.* [1], who reported higher average annual fleece weight at first shearing (4.2 kg) in Awassi sheep.

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