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THE LOHI SHEEP: A MEAT BREED OF PAKISTAN .....REVIEW

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This article describes the characteristics of Lohi sheep along with husbandry practices, phenotypic measurements and their production and reproduction performance. The Lohi is one of the best sheep breeds of Pakistan. This breed is found in the central districts of Punjab. Its rapid body growth coupled with good quality meat are the main characteristics of this breed. Lohi sheep are large, having deep and massive body, weighing on average 45-62 kg. The general body colour is white with a .large reddish brown head having .long and drooping ears. The tail is short, thick and stumpy. The average body weight at birth, 3, 6, 9 and 12 months of age IS 3.59::!:0.69, 15±0.20, 26.5±3.56, 30.4±0.40 and 33.4±0.46 kg respectively.
Kev words: husbandrv oractices, Lohi sheen, nroduction performance

INTRODUCTION

Pakistan has as many as 28 indigenous sheep breeds. These are classified into thin tail and fat tail breeds. Lohi sheep are one of the important thin tail mutton breeds available in the central districts of Punjab province (Pakistan). The breed exhibits an excellent capacity to adapt to these areas. Lohi is one of the massive and highly productive breeds which comprises some 40% of the Punjab and 15% of the national sheep population (FAO, 1997). Lohi breed is known for its rapid growth rate and multiple births (Khalil and Khan, 1984). In addition to meat, this breed also produces adequate amount of carpet wool.. An attempt is made to describe herein the characteristics of Lohi sheep along with husbandry practices and their productive and reproductive performance.

Breed Characteristics: Lohi is a fairly large-sized breed. The adult male weighs 62 kg and the female about 45 kg (Babar, 1994). They have white body colour with reddish-brown or dark-brown head and ears. The ears are long and pendulous with an appendage on their external surface locally called 'Parkan' (Khan et al., 1984 and Hasnain, 1985). They have a prominent roman nose. Neck is well set, strong and well-developed particularly in males. Both sexes are polled (Anonymous, 2001). Lohies have well-developed body, broad loin and a short stumpy tail (Khan et al., 1984). Udder and teats are moderately developed (Anonymous, 1999). Legs are long, thin and covered with wool.. The average height, length and girth measurements are 65, 62 and 82 cm with a range from 60 to 75, 55 to 70 and 72 to 97 respectively (Hasnain, 1985).

Husbandry Practices: Sheep husbandry is closely related with crop husbandry and sheep survive almost entirely on grazing and crop residues. They may be supplemented with shrubs, dry grass, tree leaves and pods and under special situations with some concentrates. Individual farmers graze their flocks, but generally several flocks are grazed together by a hired shepherd who may himself own a few sheep. The shepherd or grazier is paid in cash or kind. A common practice is to share (up to 50%) the progeny of the grazed flock. The flocks are taken to community pastures, road sides or to the canal banks for grazing. Flocks also graze on stubbles after crop harvesting. Trees may also be looped for leaves.

The flocks are taken out after collecting the sheep from their owners for grazing early in the morning and brought back to the village late in the evening. Grazing starts in the early hours of the day and continues until evening except during peak hours of scorching heat.. In between the animals are brought to the water points for watering. Both males and femal:s .are allowed to graze together. Housing is generally limited to open and may have a mudlbrick wall around, but use of thorny bushes is common to prevent the fl.ock from &etting out and the predators from getting in at night. In wmter, roofed sheds are used for housing the sheep. In most cases, the graziers sleep close to their flocks. Lambs are allowed to suckle for about 4 to 5 months. Most breeders allow the lambs to accompany their ewes to pastures as soon as they are able to walk, but in some areas the lambs are grazed separately and only allowed to suckle twice each day. In most of these cases, the owners take some share of the milk for family use. Mismothering occurs in flocks, which graze separately from lambs but exact records for disowning the lambs are often not kept.. At the government farms, where the lambs graze with their mothers until weaning, the incidence of mismothering is reported to be 1.4% in Lohi (Ishaque, 1993). While studying the various classes of Lohi sheep the flocks were reported to have on average 21.7% lambs, post-weaned 16%, hoggets 19.4%, ewes 41.5% and rams 1.4%. Proportion of lambs in the flocks during different seasons reflected that lambing continued throughout the year with peak during spring season. This practice poses lamb rearing problems. Thus there is a need to revert to seasonal breeding for better lamb survival and proper flock management. . Proportion of post-weaned males and hoggets is drastically reduced during the months following sale at "Ei~-ul~Azha", a Muslim annual festival involving sacn.ficlal slaughter of sheep, goats, etc. to meet a religious requirement.

Production Characteristics: The average birth, weaning and adult weights of Lohi males and females are 3.6, 3.4, 27, 24, 61 and 45 kg respectively. The estimates of these weights during different years ranged from 3.6 to 4.1 kg; 3.2 to 3.6 kg; 20 to 31 kg; 19 to 28 kg; 71 to 89 kg and 41 to 53 kg respectively (Khan et aI., 1962-71). Dressing percentage has been reported to vary from 50 to 55. Male animals are always heavier than their female counterparts at all ages (Sinha and Singh, 1997). The result of the studies conducted at the Livestock Production Research Institute (LPRI), Bahadurnagar, Okara have shown that average pre-weaning daily weight gain was 0.168±0.047 kg while post-weaning gain was 0.037±0.021 kg (Rehman et aI., 1994). However, Zaheer (1997) reported that the weight gain in lambs up to one month of age was 125 g per day (0.125 kg/d), which reduced to 105 g (0.105 kg) at the age of weaning (4 months). Weaning weight was 1].32±0.48 kg. Body weight of post-weaned lambs at 9 months of age was 30.52 kg and males weighed 14.9% heavier than females.

The comparison between the production levels of close monitoring (CM) and for mass extension (ME) flocks was also studied. It was found that the lambs in CM flocks were heavier at birth and at weaning than those in ME flocks. Body condition score of lambs in CM flocks averaged 2.07±0.05 as against 1.89±0.07 in ME flocks (Zaheer, 1997). Post-weaned lambs in CM flocks at 9 months of age were 7% heavier than those in ME flocks. The ewes in CM flocks weighed 14% heavier than those in ME flocks (38.3±0.38 kg vs 33.6±0.38 kg). Variation in body weight (BW) and body condition scores (BCS) of the ewes in these two types of flocks was significant (Zaheer, 1997).

Studies conducted at LPRI, Bahadurnagar outreach programme (Zaheer, 1997) showed that improved breeding and modern husbandry techniques can help to increase body weight by at least 33% over that of existing level in farmer's flocks. Lambing rate can be improved by 8% and improvement in lamb survival is possible by 4.5%. The daily weight gain of male and female post-weaned lambs was 93 g and 61 g respectively. The heritability estimates of birth weight, weaning weight, both pre- and post-weaning growth rates were 0.053±0.044, 0.131±0.059, 0.1 87±0.068 and 0.078±0.049 respectively (Rehman et aI., 1994). Genetic, phenotypic and environmental correlationsbetween some production traits are given in Table I.

The overall body weight in Lohi ewes averaged 36.23±0.59 kg and it was significantly affected by the age and the reproductive status of the ewes (Zaheer, 1997). The mean for the body condition score was 2.34 ± 0.04. The body weight in the hogget ewes was 33.51±0.65 kg with body condition score of 2.36±0.09. They showed an increase of 9.48% at 24 months, 16.14% at 36 months and 17.34% at > 48 months of age over the hogget weight (Table 2). Body weight of pregnant ewes decreased by 17.7% after lambing and body condition deteriorated by 26.3% which indicated sub-optimal feeding of the ewes during the critical period after lambing.

Some correction factors for birth and weaning weights of the Lohi flock maintained at LPR1, Bahadurnagar over a ten year period reported by Mackintosh (1993) are given in Table 3. These correction factors can be used for removing the environmental difference which affect the individual animal and hide its relative genetic potential.. The Lohi ewes produce hardly enough milk for their lambs and as such are not generally milked. The average milk yield is 120 kg with 6.3% butter fat during 120-day lactation period (Ishaque and Khan, 1963-1971).

Shearing of animals is done twice a year i.e. in spring (March-April) and then in autumn (September-October). The average annual greasy fleece yield from adults is 2.70±0.03 kg (Babar, 1994) but good specimens can yield as much as 4.5 kg wool per annum. The average fibre diameter and staple length of fleece of adult animals has been reported as 40;2 // and 52 mm, respectively. The percentage of true, heterotypic, medullated and kemp fibre is 53.5, 27.6,15.2 and 3.7 respectively (Abidi, 1964). There

Table 1. Genetic, phenotypic and environmental correlation's of some production traits of Lohi sheep

Traits	Genetic	Phenotypic	Environmental
Birth weight & weaning weight	0.675+0.465	0.188	0.145
Birth weight & pre-weaning growth	0.228+0.479	0.053	0.035
Birth weight & post-weaning growth	0.051+0.0629	0.028	0.026
Weaning weight & pre-weaning growth	0.322+0.658	0.685	0.755
Weaning weight & post-weaning growth	0.720+0.545	-0.320	-0.277

(Source: Rehman. et. al., 1994).

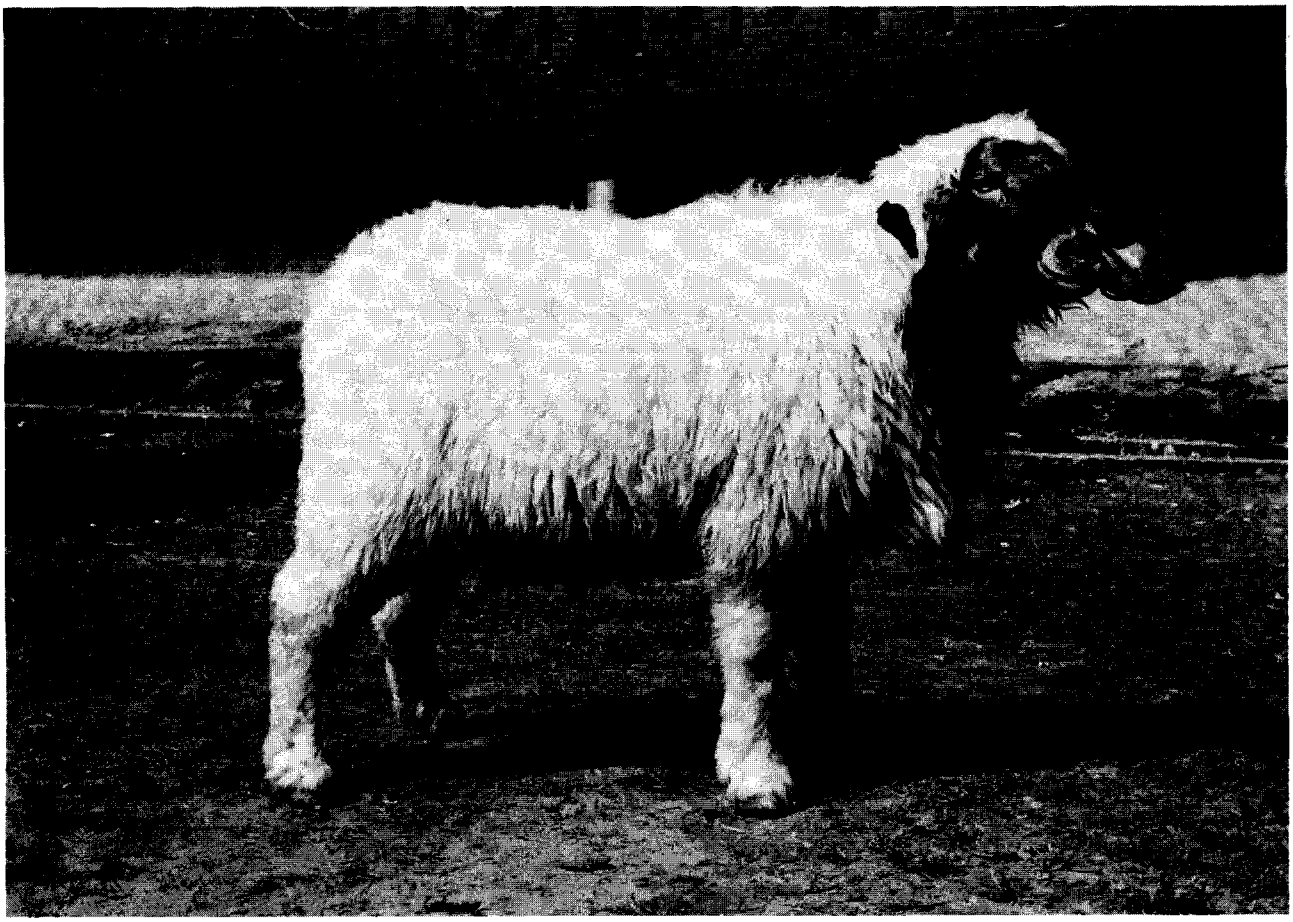
Table 2. Least squares means (LSM) for body welzht and body condition score of Lohi ewes by aae

Al!e (mo)	n.	Body weiaht (ke)	Body condition score
12	295	33.5+0.65	2.36+0.09
24	175	36.68+0.72	2.34+0.06
36	170	38.92+0.71	2.34+0.05
>48	487	39.32+0.63	2.32+0.05
Overall	1127	36.23+0.59	2.34+0.04

Table 3. Adjustment factors for birth and weanina welzhts o[illegible] ohlsheeo .

Trait	Sex of lamb	Type of birth and rearing	Aee zrouns of dams (years)			
			uo to 2 and above 6		3 to 6	
			Multiolicative	Additive	Multiplicative	Additive
Birth weight	Female	Single	1,05	0.18	1,00	0.00
		Twin	1,27	0.88	1,16	0.58
		Triplet	-	-	1,50	1,38
	Male	Single	1,04	0.15	0.96	0.15
		Twin	1,26	0.85	1,12	0.45
		Triplet	-	-	1,30	0.96
Weaning weight	Female	Single raised as sinzle	1,06	1,58	1,00	0.00
		Twin raised as twin	1,19	4.31	1,22	4.85
		Twin raised as single	1,10	2.51	1,00	0.11
		Triplet raised as trinlet	-	-	1,57	9.65
	Male	Single raised as sinale	0.93	1,97	0.92	2.40
		Twin raised as twin	1,09	2.12	1,06	1,47
		Twin raised as single	0.95	1,42	0.92	2.24

(Source: Mackintosh, 1993)



Lohi sheep (female)
(Photo by Muhammad Lateef)

is a wide diversity in various production traits of this breed which suggest that there is ample scope for improvement of its productive performance.

Reproductive Performance: Since the rams and ewes are housed and grazed together, no controlled mating is practised at farmer's level.. The animals are naturally bred. However, in Government and commercial farms controlled mating is resorted to. Culling is carried out at about six months age or so. Some males are selected for breeding mainly on the basis of their size and conformation. Others are disposed off. Most of the females are retained. No record of any type is maintained except for flocks at state farms/experiment stations. A few progressive farmers also maintain records of their flocks. The average age at first mating has been reported as 14-18 months.

There are two distinct breeding seasons that is mid February to the end of March and mid September to the end of October. The proportion of ewes lambing during spring is the highest (55.08%), whereas it is the lowest in autumn (29.55%). The proportion of ewes classified by reproductive status during different seasons is presented in Table 4.

Twinning percentage in this breed is estimated at 33% (Saleem et al., 1962-71). It was reported that ewe lambs with heavy liveweights at first breeding were superior both in productive and reproductive performance to those with low liveweights (Ahmad, 1983). Fertility rate in ewes was 90.4% in CM flocks compared with 86.9% in ME flocks (Zaheer, 1997). Lambing rate 1 was 76.1% in CM flocks and 66.9% in ME flocks, while lambing rate 2 was 84.8% in CM flocks and 69.7% in ME flocks (Table 5). Twice a year lambing by exploiting the high incidence of post-lambing oestrus and using Estrumate twice at an interval of 12 days in anoestrus ewes has been reported in Lohi sheep. The ewes bred twice a year can yield an additional lamb weight of 12.7 kg at 120 days of age per ewe bred, with a net saving of Rs. 104 per ewe (Saleem and Shah, 1983). Various estimates of reproduction parameters of the Lohi breed are presented in Table 6.

Mortality: Mortality at all ages, particularly from birth to weaning, is a serious problem in the sheep industry of Pakistan. Survival rates of lambs from birth to weaning are usually lower for multiple-born than single-born lambs, but in developed countries are seldom less than half in case of twins (Lax and Turner, 1965). The information available about sheep mortality as given in the reports of LPRI, Bahadurnagar during different years indicates an average mortality of 9% in lambs (Anonymous, 1994-1997), which probably does not reflect a true picture. The most important cause of mortality in young animals is pneumonia, mainly due to bacterial infection, and in adults parasitic infestation. Mortality rates for lambs in CM flocks and ME flocks were reported as 7.8% and 20.5% respectively (Zaheer, 1997).

Recommendations and Suggestions: Lohi sheep possess a vast potential for further development. It is important that the real place of sheep in the agricultural economy of the country should be accurately determined so that attention may be focused on it according to its share in GDP, especially for the welfare of a vast majority of landless and small farmers whose only or the major source of livelihood is sheep production. It is suggested that different aspects of Lohi sheep be scientifically investigated so that its exact potential is fully exploited.

The adoption of better health control measures and improved production practices will result in healthy and more productive Lohi sheep. Higher lamb survival rate is apt to enhance dividends over the cost incurred for adoption of improved production practices. In addition, the following areas are suggested for further investigation:

- Improvement through selection within a breed.
- Raising of Lohi sheep under different managemental conditions and studying their growth pattern from birth to slaughter.
- Studying the performance of Lohi sheep kept under different economical feeding regimes.
- Studying the economics of meat production from Lohi males.

Table 4. Percent of Lohi ewes as classified by reproductive status during different seasons

Reproductive status	Autumn	Winter	SPring	Summer
Non-oreanant	12.96	6.25	3.21	11.66
Mated	17,71	9.38	5.34	3.34
Pregnant	38.06	33.48	33.69	31.39
Gave birth	29.55	49.55	55.08	52.47
Aborted/sti11births	2.02	1,34	2.68	1,34
Total	100	100	100	100

Table 5. Fertility and lambina rates in Lohi ewes of close montioring and mass extension flocks

Parameter	Mass extension flocks	Close monitorin!!: flocks
No. of flocks	5	4
No. of ewes	175	197
No. of ewes lambed	100	120
No. of ewes lambed & No. of oreznant	12	18
No. of ewes lambed 2 x yr	5	12
No. of ewes oreznant	26	28
No. of ewes non-pregnant	23	20
No. of ewes aborted/stillbirth	0	I
No. of lambs born	122	167
Fertility rate (%)	86.9	90.4
Lambing rate I (%)	66.9	76.1
Lambing rate 2 (%)	69.7	84.8

Fertility rate = (No. of ewes in the flocks - No. of non-pregnant ewes) x 100

Lambing rate I = No. of ewes lambedlNo. of ewes in the flocks x 100

Lambing rate 2 = No. of lambs producedlNo. of ewes in the flocks x 100

- Post-slaughter handling methods and their possible improvement in our set up.
- Whether breeding Lohi sheep twice a year is economical and not detrimental to the ewes and the lambs obtained therefrom?

Table 6. Reproduction performance of Lohi sheep

Parameter	Units
Age at first breeding	14 to 18 Mon.
Weight at first breeding	41.87 kg
Weight at second breeding	43.93 kg
Weight at third breeding	45.23 kg
Gestation period	152 d
Breeding season	Feb 15 to Mar 31 & Sept 15 to Oct 30
Twinning percentage	33
Lambing interval	10 Mon.
Next oestrus after lambing	2 to 4 Mon.
First service conception rate	72%
Number of services required per conception	1.2-1.29
Fertility	76%
Longevity	10 Yr.

(Source: Mackintosh, 1993 & Babar, 1994)

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REFERENCES

Abidi, M.H. 1964. Final Report 'Scheme on Investigation and Research on Pakistan Wools'. Wool Test House, Department of Marketing Intelligence and Agricultural Statistics, Government of Pakistan, Karachi.

Ahrnad, M.K. 1983. Effect of body weights of ewes before exposure at first breeding on lamb production. J. Anim. Sci. Pak. 5: I.

Anonymous. 1994-97. Annual Reports of the Livestock Production Research Institute, Bahadurnagar, Okara, Pakistan.

Anonymous. 1999. Famous Livestock Breeds of Punjab, Department of Livestock and Dairy Development, Punjab, Lahore, Pakistan.

Anonymous. 200 I. Breeds of Livestock, Animal Science House Page, Oklahoma State University, Stillwater, OK., USA.

Babar, M.E. 1994. Genetic and phenotypic parameters of some performance characteristics of Lohi sheep. Ph.D. Dissertation. University of Agriculture. Faisalabad, Pakistan.

FAO. 1997. Report of the FAO/ADB Cooperative Programme entitled as Pakistan Livestock Sector Study (55/87 AS-PAK 39), Phase I, Vol. I. FAO. Rome.

Hasnain, H.U. 1985. Sheep and Goats in Pakistan. FAO Animal Production and Health Paper No. 56, Rome.

Ishaque, S.M. and M.A. Khan. 1963-71. Milk and butterfat yield in 120 days/fulllactatioD and its relationship with body weight. Annual Reports of the Directorate of Livestock Farms, Punjab, Lahore.

Ishaque, S.M. 1993. Sheep Management Systems. In Sheep Production in Pakistan. A Manual for Students, Teachers and Research Workers. J.B. Mackintosh (Ed.), PARC, Islamabad.

Khalil, M. and H.A. Khan. 1984. Study on the productive and reproductive performance of Lohi sheep at farmer's level. Fifth Annual Report, LPRI, Bahadurnagar, Okara, Pakistan.

Khan, B.B., M. Younas, S.H. Hanjra. 1984. Breeds and Types of Livestock, 2nd ed., University of Agriculture, Faisalabad, Pakistan.

Khan, MA, S.M. Ishaque, N.A. Saleem and S.B. Khan. 1962-71. Study of birth, weaning, adult weights and daily growth rates of different breeds of sheep. First to ninth annual reports of the Directorate of Livestock Farms, Punjab, Lahore.

Lax, J. and H.N. Turner.. 1965. The influence of various factors on survival rate to weaning of Merino lambs. I. Sex, location and age of the ewe for single-born lambs. Aust. J. Agri. Res. 16: 981-995.

Mackintosh, 1.B. 1993. Sheep Production in Pakistan: A Manual for Students, Teachers and Research Workers. PARC, Islamabad.

Rehman, A., M.K. Ahmad and M. Shafiq. 1994. Inheritance and genetic correlations of productive traits in Lohi sheep. 15th Annual Report, LPRI Bahadurnagar, Okara, Pakistan.

Saleern, M. and S.K. Shah. 1983. Twice a year lambing system of Lohi sheep. Pak. 1. Agri. Res. 4: 97-105.

Saleern, N.A., MA Khan and S.M. Ishaque. 1962-71. Breeding/conception behaviour and fertility/twinning births in ewes. Annual Reports of the Directorate of Livestock Farms, Punjab, Lahore.

Sinha, N.K. and S.K. Singh. 1997. Genetic and phenotypic parameters of body weights, average daily gains and first shearing wool yield in Muzaffarnagri sheep. Small Ruminant Research, 26: 21-29.

Zaheer, A. 1997. Terminal Report of Coordinated Research Project for the Development of Sheep and Wool in Pakistan (PAK/88/032). FAOIUNDP, Islamabad.

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